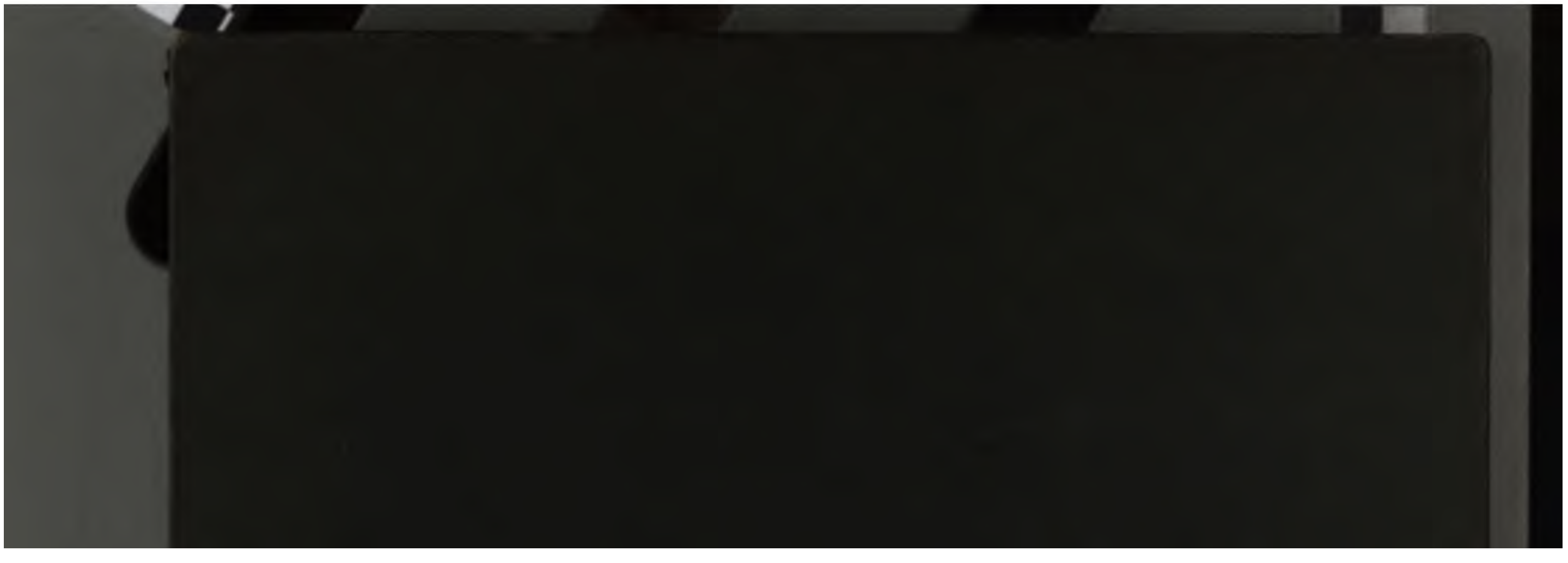

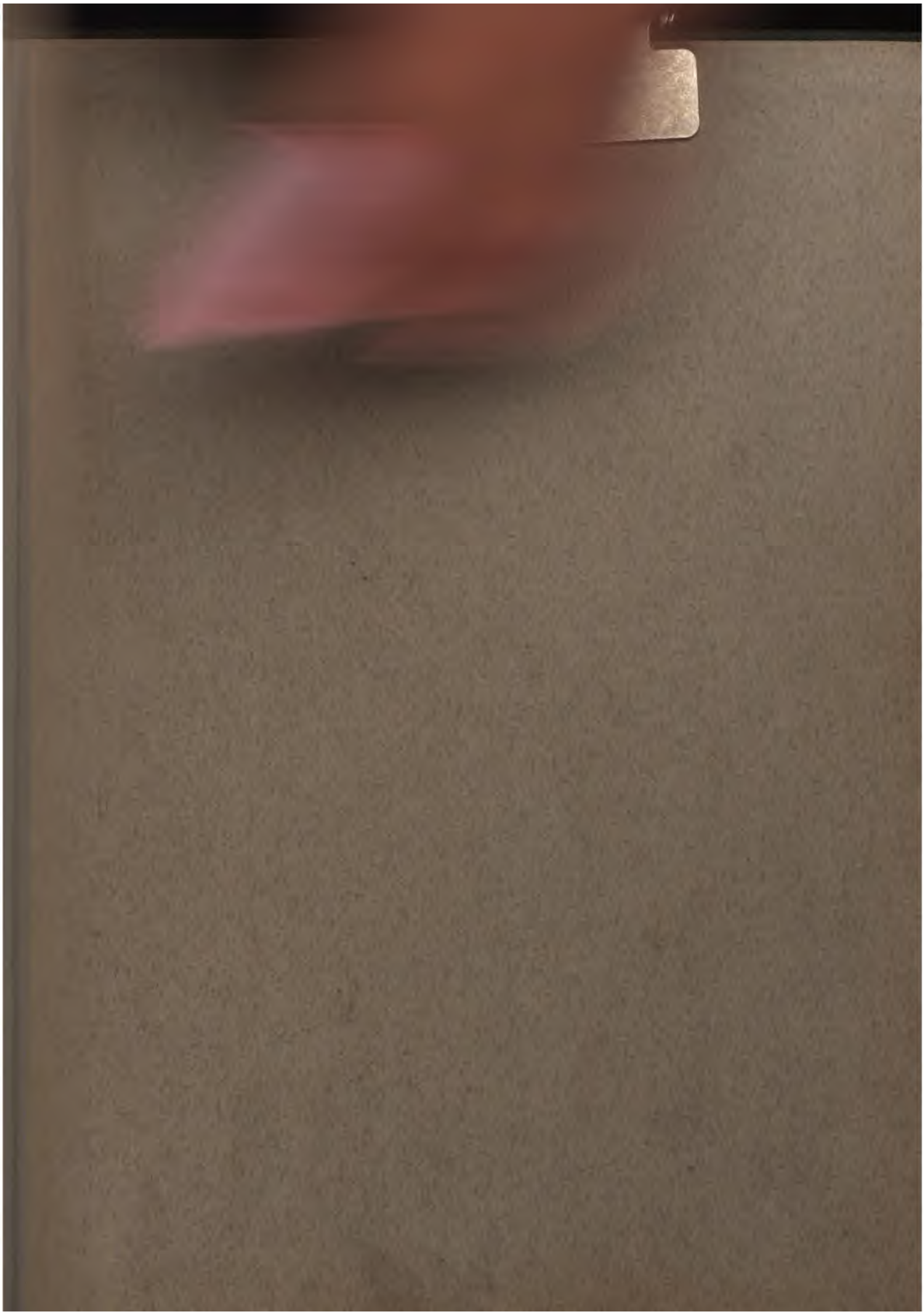

NATURAL GAS AND GASOLINE JOURNAL

Vol. 12 JANUARY 1918 No. 1

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General Office and Publishing Plant, Dallas, Texas

Disposal of Condensation— The Gas Man's Greatest Problem Solved

Westinghouse Positive Gas Meter

An Automatic Overflow In Westinghouse Improved Positive and proportional Gas Meters Drains Off All Condensation

Another distinctive feature of Westinghouse Improved Gas Meters is their all-metal construction. They have no leather diaphragms to stretch and break when used under high pressure or, when used under vacuum or normal pressure, to become worthless after a few days' subjection to condensate, making the registration inaccurate or stopping meter altogether.

Westinghouse Improved Gas Meters are particularly adapted for measuring casing-head gas or any gas impregnated with gasoline, or other condensate. They are equally accurate at both minimum and maximum capacities. Self lubricating bearings, eliminating undue wear, guarantee the longest life and low maintenance cost.

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General Office and Works: EAST PITTSBURGH, PA.

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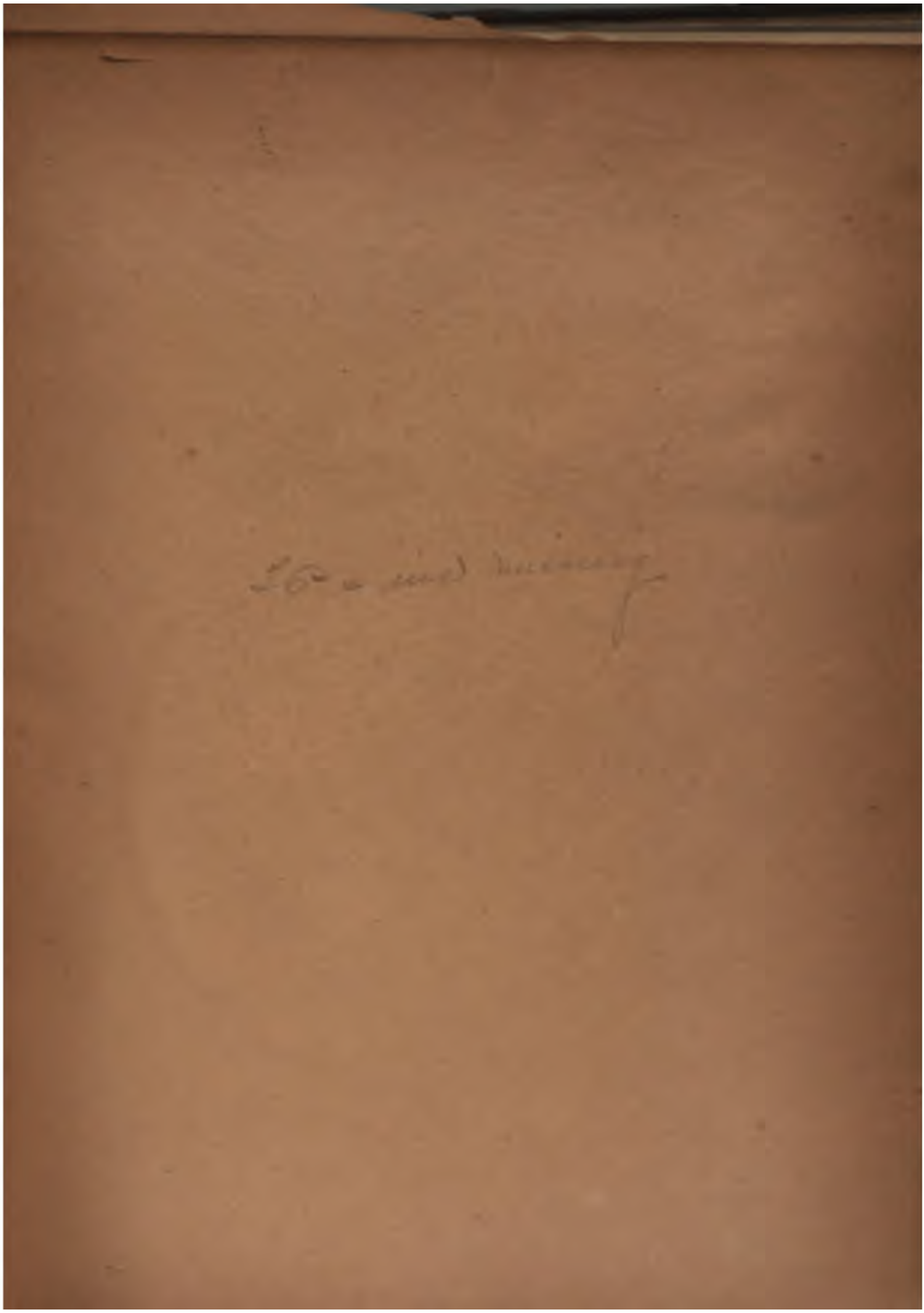
149 Broadway	5 So. Wabash Ave.	6 W. 10th St.	1433 Main St.	631 So. Spring St.	802 Madison Street

Also manufacturers of "Ironclad" Dry Gas Meters, Meter Provers,— and "Keystone" and "Eureka" Water Meters.



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CONTENTS FOR JANUARY, 1918

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CONTENTS OF THIS ISSUE

FROM THE EDITORIAL MAIL BAG:

AROUND THE BELT.

MEMBERS OF ASSOCIATION OF NATURAL GAS SUPPLY MEN

DAVID O. MOLBROOK, President, Oliver Building, Pittsburgh

ARMOUR ADAMS, Secretary, 1304 First National Bank Building, Pittsburgh

Apco Iron Works, Corry, Pa.
Allegheny Steel Co., Pittsburgh
Amber Packing Co., Pittsburgh

Bessemer Gas Engine Co., Grove City
Blodgett Co., Inc., The G. S. Burlington, Vt
Burdon Company, Warren, Ohio.
Bovaird & Seyfang Mfg. Co., Bradford, Pa.
Bristol Co., The, Waterbury, Conn.
Broderick & Bascom Rope Co., St. Louis
Bryant Heater & Mfg. Co., Cleveland.
Buffalo Co-operative Stove Co., Buffalo.
Builders Iron Fdy., Providence.
Byers, A. M. Co., Pittsburgh.

Carnegie Steel Co., Pittsburgh.
Chaplin-Fulton Mfg. Co., Pittsburgh.
Cincinnati Rubber Mfg. Co., Cincinnati.
Clark & Norton Mfg. Co., Wellsville, N. Y.
Cleveland Gas Meter Co., Cleveland.
Colonna Mfg. Co., Pittsburgh.
Columbia Gas Stove Co., Huntington, W.Va.
Columbian Rope Co., Auburn, N. Y.
Columbus H'tg & Vent'g Co., Columbus.
Continental Supply Co., St. Louis.
Cooper, C. & G. Co., Mt. Vernon, O.
Crandall-Potter Co., New York City.
Cutler Hammer Mfg. Co., The Milwaukee

Dayton Bournonville Co., Jersey City
Dayton Pipe Coupling Co., Dayton.
Dayton, N. C., Gas Burner & Welding Co. Pittsburgh
Dunbrook Engineering Co., Dayton, O.
Draeger Oxygen Apparatus Co., Pittsburgh
Dresser, S. R., Mfg. Co., Bradford, Pa.

[illegible] Meter Co., Pittsburgh
[illegible] Stove Co., Hamilton, O.

[illegible] Iron Works, Philadelphia, Pa.
[illegible] Co., The, Boston, Mass.
[illegible] Co., The, Canton, O.
[illegible] & Lindsay Co., Pittsburgh
[illegible] Co., The, Houston, Texas

[illegible] Packing Co., Pompey, N. Y.
[illegible] Age, The, New York City
[illegible] Appliance Co., Cleveland
[illegible] Record, Chicago
[illegible] Fire Brick Co., Providence
[illegible] Gas Light Co., Rochester
Gerner Stove Co., Erie
Gilliam Machine Works, Syracuse, N. Y.
Goodrich, B. F. Co., Akron, O.
Graves Supply Co., Cincinnati
Guardian Gas Appliance Co., The, Cleveland, Ohio
Gwynn Gas Burner & Eng. Co., Pittsburgh

Hammon Coupler Co., Pittsburgh
Harmount Co., Muncie, Ind.
Hays Mfg. Co., Erie.
Hart Mfg. Co., Cleveland.
Hazard Mfg. Co., Chicago.
Hester, C. M. Sons & Co., Inc., Boston, Pa.
Hewitt Rubber Co., Pittsburgh.
Hoover, Owens, Rentschler Co., Hamilton, O.
Hope Engineering & Supply Co., Pittsburgh

Ideal Heating Co., The, Columbus
Imperial Belting Co., Chicago, Ill.
Ingersoll-Rand Co., Pittsburgh.
International Hale [illegible] Company, Providence
Iroquois Natural Gas Co., Buffalo, N. Y.

Jewell Mfg. Co., Erie
Jolly Water Heater Co., St. Louis
Jones & Laughlin Steel Co., Pittsburgh, Pa.

[illegible] Iron Works, Steubenville, O.
[illegible] Furnace Co., Cleveland, Ohio
[illegible] A. & Sons Rope Co., St. Louis
[illegible] Automatic Heat Reg. Co., Cleveland
[illegible] Mfg. Co., Pittsburgh

Ludlow Valve Mfg. Co., Pittsburgh

Macomber & Whyte Rope Co., Chicago
Manhattan Rubber Mfg. Co., Passaic, N. J.
Mark Mfg. Co., Chicago.
Mason Premix Burner Co., Monroe, Ind.
Meek Oven Mfg. Co., Newburyport, Mass.
Metric Metal Works, Erie
Minneapolis Heat Reg. Co., Minneapolis
Moline Iron Wks., Quincy, Ill.
Modern Safety Iron Co., Philadelphia.
Moon Mfg. Co., The, Chicago.
Moore, Lee C. & Co., Inc., Pittsburgh.
Moser Mfg. Co., Kane, Pa.
Mueller H. Mfg. Co., Decatur, Ill.

Nathan Mfg. Co., New York City
National Supply Co., Pittsburgh.
National Transit Pump & Mach. Co., Oil City, Pa.
National Tube Co., Pittsburgh.
Natural Gas & Gasoline Journal, Buffalo
New Bedford Cordage Co., New York City
New York Belt'g & Pack'g Co., New York
Nye, A. T. & Son Co., Marietta, O.

Oil & Gas Journal, Tulsa, Okla.
Oil City Boiler Wks., Oil City, Pa.
Oil Trade Journal, New York.
Oil Well Supply Co., Pittsburgh
Oxweld Acetylene Co., Chicago.

Parkersburg Mach. Co., Parkersburg, W. Va.
Parkersburg Rig & Reel Co., Parkersburg, W. Va.
Peerless Heater Co., Pittsburgh
Pennsylvania Furnace & Stove Co., Warren, Pa.
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Reid, Jas. Gas Engine Co., Erie, Pa.
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Republic Iron & Steel Co., Youngstown, O.
Revere Rubber Co., Chelsea, Mass.
Reznor Mfg. Co., Ltd., Mercer, Pa.
Riverside Mfg. Co., Ltd., Franklin, Pa.
Robinson, J. [illegible] Co., Oil City, Pa.
Robinson Packer & Mach. Co., Coffeyville, Kansas.
Rushton, John A. Sons Co., Trenton, N. J.
Rusmisel's Rubber Belt & Hose Co., Newark, N. J.
Rusol Mfg. Co., Pittsburgh

Sandberg Co. of America, Limited, Pa.
Schaeffer & Budenberg Mfg. Co., Pittsburgh
Schneider Heater Co., The, Cleveland, Ohio
Seiberling Co., Canton, O.
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Stevenson Gas Iron Co., Philadelphia.
Superior Gas Engine Co., Springfield, O.

Tate Jones & Co., Inc., Pittsburgh
Taylor, W. F. G., Buffalo.
Toledo Pipe Threading Mach. Co., Toledo, O.
Troy Mfg. Co., Pittsburgh

[illegible] Co., The, Columbus
Tube Valve & Fitting Co., Troy, N. Y.

Underfeed Stoker Co., Pittsburgh
Underwriters Meter Co., Pittsburgh
Underwriters Pipe & Mfg. Co., Pittsburgh
Utility Co., Pittsburgh

Valley Iron & Iron Co., Wheeling
Valve Fittings Co., Erie, Pa.
Vulcan Iron Works & Mach. Co., Buffalo
Wright Gas Co., Worcester, Mass.
[illegible] Steel & Tube Co., Youngstown, O.

ANNUAL CONVENTION NATURAL GAS ASSOCIATION OF AMERICA AND NATURAL GAS SUPPLY ASSOCIATION OF NATURAL GAS SUPPLY MEN [illegible]

THE YEAR 1918.

WHILE the necessities of the war have immensely curtailed supplies of raw materials, have interfered with deliveries of raw materials and the shipping of finished products, and while some of our gas companies have through one cause and another, shut down to quite an extent on their activities, yet we believe that the commercial life of this great nation and of the industry of which this magazine is a part, will so adjust themselves to conditions, as to lessen in 1918 some of the stress in the closing months of 1917 and opening of 1918, and this, notwithstanding the fact that we shall in 1918, unless the unforeseen occurs, be more deeply in war matters with our own men, than in the preceding year.

We shall very likely during 1918 be discharging at the enemy from our ordnance and our smaller arms, vast tonnage of explosives and projectiles in addition to what we shall be called upon to supply to our allies, yet those at the helm have in mind the need for keeping up our commercial life and industries, that commercially our country shall not be crippled, and in order to provide funds whereby artisans and others who have bought Liberty Bonds on the installment plan, will be enabled to meet their obligations, and that the country itself may in turn meet its obligations. This being the case, every effort will be undertaken to keep the wheels of trade well in motion, even in face of industrial shut-downs, this is the case.

Our manufacturers should maintain their activities, they should patronize those dependent upon them, as they will expect patronage from those upon whom they depend for their business life. We must keep the ball rolling. We must remember that to shut off our activities and our patronage, would bring about curtailments and disaster in many branches of business, most of which can be avoided if sane methods are pursued and patronage is continued.

It is surprising to note how well, commercially, the country has stood up under the tremendous strain that came to it, all of a sudden, when finally war was declared by the United States, and during the period of things finding their level, and of the commercial machinery of the country righting itself.

This is the time when every enterprise must stand by its neighbor-enterprises and with such a condition in vogue, every industry may anticipate the return to it, of the equivalent of the funds it has expended. Such conditions result in a cycle of activity. He who spends, receives again.

Keep your patronage active in 1918.

Lucius L. Bigelow

FROM THE EDITORIAL MAIL BAG

WESTERN ASSOCIATIONS MERGE

VAST ACREAGE DEAL

Two Hundred and Eighty-eight Square Miles Added to Holdings Gives [illegible] Cubic Feet More of Natural Gas to Kansas City

BUREAU OF MINES ISSUES BULLETIN ON CUSHING FIELD

Allied Industries

Recovery of Gasoline from Natural Gas as an Industry Allied to Production and Refining of Petroleum.

BY FRANK P. [illegible]

The manufacture of gasoline by recovery of [illegible] from the natural gases in which [illegible] and the present status of the industry, [illegible] development and future extensions [illegible] is so broad that to handle it in [illegible] would require a volume not paper. The writer will therefore attempt to concentrate the [illegible] matter on the subject in a general presentation [illegible] some of the most interesting details of [illegible] that are important to the industry.

[illegible] has been largely on the principles [illegible] and has, to a large extent, has [illegible] which are not essential [illegible] but [illegible] of refinery [illegible] but [illegible] of refinery [illegible] treat [illegible] the materials.

[illegible] the subject, the [illegible] processes [illegible] relatively [illegible] recent [illegible] the public is now beginning to benefit from [illegible] the relation between the two forces [illegible] possible for the petroleum supplies. Where [illegible] the refinery could be operated with a distillation product intermediate physically between [illegible] and are sold to [illegible] unable to [illegible] a sufficient [illegible] that particular fraction from [illegible] operations. The demand for such a product [illegible] until more [illegible] gasoline are required [illegible] the consuming public has been educated [illegible] and [illegible] demand for this product and [illegible] accept a wider latitude in the product [illegible] commercially classified as gasoline and it would be [illegible] to estimate at present the increased [illegible] of commercial gasoline that has resulted from the development of the gas gasoline industry.

[illegible] as Mid-Continent field, [illegible] Oklahoma and Kansas, the [illegible] with [illegible] among head of natural [illegible] commercial. Since [illegible] per cent [illegible] which would not [illegible] the product [illegible] able to [illegible] something in [illegible] that the [illegible] that in all other [illegible] that some [illegible] [illegible] Kansas [illegible]

Nothing is so clear and precise as time. — Rabelais

million cubic feet open flow in gas wells, will give an additional supply of about ten million feet a day as soon as connections with our present properties can be made."—Doherty News.

TO PREVENT GAS STEALING.

FOR the guidance of those who are interested in right and justice it is important that action taken in the State of Texas should be widely published. A law against stealing gas in Texas was formulated with the hope that gas pilfering might be, not curtailed, but absolutely cut off. The law went into effect January 1st, and brings to the fore the following features which include a ban upon the stealing of water or electric current, as well as upon the stealing of gas. The first section sets forth that, "Whoever, intentionally, by any means or device, prevents electric current, water or gas from passing through any meter or meters belonging to a person, corporation, or company, engaged in the manufacture or sale of electricity, water or gas, for lighting, power or other purposes, furnished such person to register the current of electricity, water or gas, passing through meters, or intentionally prevents a meter from duly registering the quantity of electricity, water or gas supplied, or in any way, interferes with its proper action or just regulation, or without the consent of such corporation or company, intentionally diverts any electric current from any wire, or water or gas from any pipe or pipes of such person, corporation or company, or otherwise intentionally uses, or causes to be used, without the consent of such person, corporation or company any electricity or gas manufactured, or water produced or distributed, by such person, corporation or company, or any person, corporation or company who retains possession of, or refuses to deliver, any meter or meters, lamp or lamps, or other appliances which may be, or may have been, loaned them by any person, corporation or company for the purpose of furnishing electricity, water or gas, through the same, with the intent to defraud such person, corporation or company, or, if any person, corporation or company engaged in the manufacture or other purposes, shall knowingly misread any meter or overcharge any customer for such light, water or gas furnished, shall, for every such offense, be punished by a fine of not less than twenty-five dollars and not more than one hundred dollars. Every person, firm or corporation engaged in the business referred to in this act shall keep displayed at all times in a conspicuous place in their office, a printed copy of this law."

The second section provides as follows: "The presence at any time, on or about such meter or meters, wire or wires, pipe or pipes, of any device or pipes or wires resulting in the diversion of electric current, water or gas, as above defined or resulting in the prevention of the proper action or just registration of the meter or meters, as above set forth, shall constitute prima facie evidence of knowledge on the part of the person having custody and control of the room or place where such device or pipe or wires of the existence thereof and the effect thereof and shall further constitute prima facie evidence of intention on the part of such person to defraud and shall bring such person prima facie within the scope, meaning and penalties of this act."

IN NATURAL GAS BUSINESS THIRTY-FOUR YEARS.

SAM W. SNYDER, for many years foreman for the United Natural Gas Co. at Sharon, Pa., retired from active service on December 31st, 1917.

Mr. Snyder was connected with the gas interest for 34 years, and made a name for himself as the originator of the Snyder movement, which was placed in the old Metric meters.

A dinner was given to Mr. Snyder by his associates at Sharon on New Year's eve, twenty-six employes being at the affair, this being the entire force except one man, who had to remain on the job on account of low pressure.

John P. Curry, agent, was toast-master, and in a few words told of Mr. Snyder's connection with the business, and on behalf of the employes presented Mr. Snyder with a Royal easy chair.

While taken by surprise, Mr. Snyder found words to thank the donors. His remarks were followed by a short talk by Mr. Peter C. Curry and other members of the party.

BULLETIN ON COST ACCOUNTING.

THE Bureau of Mines, Department of the Interior, has recently issued Bulletin No. 158 on "Cost Accounting for Oil Producers," by Clarence G. Smith. This is the first treatise of its kind and is a simple explanation of the methods that may be employed in cost accounting for oil producers, who, on account of the peculiar and unusual conditions affecting oil production, require a much different system of cost accounting than any other class of business men.

This publication may be obtained free of charge by application to the Director, Bureau of Mines, Washington, D. C.

ANOTHER SUBSTITUTE FOR GASOLINE.

ACCORDING to the *Scientific American*, a new substitute for gasoline is being tried out in Germany. One part benzol and two parts alcohol are used, it is said, with good results. An ordinary carburetor may be used, and in a test a car ran 250 miles on one pint of the mixture. A speed of 31 miles an hour can be attained, it is said, on this fuel.

Since both alcohol and benzol are easily obtainable in Germany, the discovery of this new fuel would naturally be of the greatest importance to the Germans.

It is by presence of mind in untried emergencies that the native metal of a man is tested.—Lowell

Allied Industries

Recovery of Gasoline from Natural Gas as an Industry Allied to Production and Refining of Petroleum.

BY FRANK P PETERSON TULSA OKLA

THE manufacture of gasoline by recovery or precipitation from the natural gases in which it is found the present status of the industry, its past development and future extensions offer a subject which is so broad that to handle it in its entirety would require a voluminous paper The writer will, therefore, attempt to concentrate the essential matter of the subject for a general presentation, giving some of the most interesting details of the factors that are important to the industry

This industry has drawn liberally on the principles of physics and chemistry, and to a large extent has had to adapt such information as is most useful not from data recorded with reference to petroleum, but from data recorded with reference to general treatment of other materials

Because of the complex character of the petroleum series of hydrocarbons and the fact that data such as solubilities vapor pressures etc of the different petroleum compounds have not been determined we are still working by rule of thumb on some essential phases of the industry Just now the difficulties of determining such data are almost insurmountable We have not one but two hundred to deal with not one but several pentanes hexanes heptanes and as we ascend in the series the number and variety of isomers increase at such a rate as to make the task of isolating and studying their physical characteristics almost beyond the hope of possible attainment

The industry is the connecting link knitting the interests of oil producers and refiners into a much closer relationship than ever existed prior to its creation and development The relation between the producer and the refiner of petroleum prior to 1904 was a rather antagonistic one in a commercial sense It was to the interest of the producer to realize every dollar possible from the crude petroleum while it was a maximum consideration on the refiners interest was to obtain the same product at a minimum consideration therefore each was in the habit of [illegible] consumer as far as possible the trade secrets of the business Each [illegible] and apparatus for [illegible] each [illegible] a mystery to the other [illegible] The [illegible]

consuming public is now beginning to benefit from some measure of co-operation between the two forces vitally responsible for our petroleum supplies Where formerly the refiner found himself overstocked with a distillation product intermediate physically between gasoline and kerosene he now finds himself unable to produce a sufficiency of that particular fraction from his refinery operations The demand for such a product has grown until millions of gallons are required to meet it The consuming public has been educated through the casing head demand for this product and its usage of it to accept a wider latitude in the product commercially classified as gasoline and it would be difficult indeed to estimate at present the increased volume of commercial gasoline that has resulted from the development of the gas gasoline industry

In the territory referred to as Mid Continent field, and embracing chiefly Oklahoma and Kansas, the present year's output of raw casing head or natural gas gasoline is something over [illegible] gal Since this product is mixed with as much as 80 per cent of its bulk of refined oil or else that which would not otherwise be considered as motor gasoline the production of casing head gasoline in this district adds to the available supply of motor gasoline something in excess of [illegible] gal yearly It is likely that the yield in this territory will soon equal that of all other [illegible] fields in the United States and that somewhere in the neighborhood of [illegible] gal yearly or more than the results from the seven years of [illegible] in the states which has now [illegible]

The [illegible] and shortly had an increase along [illegible] in the Oklahoma Kansas Pennsylvania A [illegible] was developed there under the [illegible] Between the years [illegible] and [illegible] there [illegible] which [illegible] were at Bartlesville Okla and Sistersville W Va [illegible] gasoline plant on the [illegible] The [illegible] was operating from [illegible] and [illegible] were [illegible] gas [illegible] the amount that has been [illegible] this fact with the exception of [illegible] pressure The [illegible]

Nothing is so dear and precious as time Rabelais

liquid condensate was relieved from under operating pressure of the gas. This installation even went so far as to saturate the incoming gas by bubbling it up through the crude oil produced from the lease, and, at the same time, raising the temperature of the crude to a degree that encouraged the throwing out of a light gasoline fraction from the oil. Attached to the crank shaft of the compressor by means of a small eccentric, was a tiny pump cylinder ⅞ in. bore by ¾ in. stroke, as I recall it. This little pump forced a naphtha stream into the discharge pipe line directly after the connection on the compressor cylinder. The naphtha was atomized and probably partially vaporized and carried along with the stream of gas under pressure, combining the functions of operation into a fairly well

FIG. 1.—DETAIL SECTION OF EXPERIMENTAL ABSORBERS, IN AN ABSORPTION GASOLINE PLANT.

worked out absorption plant. The blended product from this plant was as good as that from a most modern equipment operating on the larger scales of the present day. It is only within the last two years that this method of blending has been more or less generally adopted as the best practice in the Oklahoma fields where a high degree of efficiency has been reached. Further history of the industry has but little to add in the way of details of equipment and method of operation. One very important factor which was suggested and applied by the writer, was the increase of operating pressure from about 7 to 18 atmospheres. This was done in an effort to overcome some of the anticipated difficulties and without a very clear understanding of the physics involved other than a crude perception of the evident fact that the condensible vapor constituents were not present in a very large ratio percentage. Pressures as high as 350 lb. gage have been applied. Results of such pressure application have not been generally considered favorable, so that this extent of pressure application was never adopted except in a few instances.

The average range of pressure application in compression type plants throughout the United States will now be somewhat in excess of 235 lb. gage. The industry had its full recognition of its possibilities in the Eastern fields during the year 1911. In Oklahoma, 1912 saw more or less indifferent recognition of the possibilities of the industry, following the pioneer development of W. D. Franchot & Co., which may be accredited as the initial development of the industry in the Mid-Continent field. California fields followed with aggressive development closely on the heels of Oklahoma initiative, and, to a large extent, California developed her resources in this industry a year or more ago.

The history of the technical phases of the development is more interesting than that of the industrial. Early and convincing evidence was available that some means not then known would have to be found for determining, roughly at least, the relative gasoline saturation of gases from the different wells and the different fields. A tedious and somewhat expensive course of investigations was made, hundreds of samples of gases being examined. This work was done in the first half of the year 1909, when results of plant operation were available from only a limited number of producing operations. Comparisons were made of samples obtained from operating plants with results indicated by the above-mentioned methods of examination.

Small test compressors were used following the laboratory examination of gas samples. Results by comparison with compressor tests were added, and the present method known as Physical Compression Tests was evolved. Adaptation of the automobile as a means of transporting and operating these little test sets is an Oklahoma innovation.

Two general methods of operation are now applied. We have referred thus far almost exclusively to the method known as compression. A later method which is adapted to handle more effectively gases of light gasoline saturation is known as the absorption method. It had its inception in the lower gas fields of West Virginia, and two claimants having appeared to contend for priority in the conception, litigation has followed.

The first application of this method was made in compressing stations that were used in the transmission of large volumes of natural gas from the producing wells to the point of consumption. The use of an absorbent, extracting entrained heavy hydrocarbons and drying the gas, got rid of liquids which might accumulate at low places on the line or even reach the ultimate consumer in the form of gasoline when temperature conditions were sufficiently low to bring about their condensation. Also, as the value of the gasoline increased, the recovery and separation of even a small amount of it from the very large volumes of gas handled became quite profitable.

The doors of wisdom are never shut.—Benjamin Franklin.

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The history of the technical phases of the development is more interesting than that of the industrial. Early and convincing evidence was available that some means not then known would have to be found for determining, roughly at least, the relative gasoline saturation of gases from the different wells and the different fields. A tedious and somewhat expensive course of investigations was made, hundreds of samples of gases being examined. This work was done in the first half of the year 1910, when results of plant operation were available from only a limited number of producing operations. Comparisons were made of samples obtained from operating plants with results indicated by the above-mentioned methods of examination.

Small test compressors were used following the laboratory examination of gas samples. Results by comparison with compressor tests were added, and the present method known as Physical Compression Tests was evolved. Adaptation of the automobile as a means of transporting and operating these little test sets is an Oklahoma innovation.

Two general methods of operation are now applied. We have referred thus far almost exclusively to the method known as compression. A later method which is adapted to handle more effectively gases of light gasoline saturation is known as the absorption method. It had its inception in the lower gas fields of West Virginia, and two claimants having appeared to contend for priority in the conception, litigation has followed.

The first application of this method was made in compressing stations that were used in the transmission of large volumes of natural gas from the producing wells to the point of consumption. The use of an absorbent, extracting entrained heavy hydrocarbons and drying the gas, got rid of liquids which might accumulate at low places on the line or even reach the ultimate consumer in the form of gasoline when temperature conditions were sufficiently low to bring about their condensation. Also, as the value of the gasoline increased, the recovery and separation of even a small amount of it from the very large volumes of gas handled became quite profitable.

The doors of wisdom are never shut.—Benjamin Franklin

its percentage, freezes at the reduced temperature maintained and makes trouble. Where naphtha is being continually used for blending with the raw output in compression operation, the application of the end absorber is exceedingly simple and involves practically no attention other than continuous pumping of a supply of naphtha against the prevailing gas pressure.

A quite recent refrigerating scheme applies ammonia to the cooling of brine and then brings the brine in contact with the residual gas. In California some three years ago, the application of ammonia refrigeration was successfully made and one or more plants of considerable size are now operating in that field along those lines. It is not possible for a compression operation to separate completely the heavy hydrocarbon vapors from the gas in which they are carried, and the increase in gasoline yield effected by intense refrigeration may amount to 10 per cent. or better of the gross gasoline yield of the gas. The condensation of the vapors is less complete when the gas being worked is diluted by any material percentage of air. It is almost impossible to eliminate air entirely from the gas being withdrawn from wells under vacuum. Therefore, from the viewpoint of increased efficiency, the application of intensive refrigeration, or of absorption, for recovery of tail-gas saturation is justifiable in every compressor operation of any considerable magnitude.

Absorption will be described rather with relation to the gas that does not issue from an oil well. We will not consider vacuum as a function of the absorption operation.

It is a well known law of physics, readily demonstrated in practice, that the effectiveness of absorption of gas or vapor by a liquid with which it is present is proportional to the pressure exerted on the gas. It has been found in practice that most effective results can be had in absorption operation under the application of three or more atmospheres of pressure. At pressures considerably lower than three atmospheres, it has been found that the efficiency of absorption operation reduces to an extent involving the calling for excessive absorption equipment by reason of the longer time required. Under this method, where sufficient pressure is not available from the well (rock pressure), artificial means are employed.

Absorber chambers are used through which the gas is passed under pressure. The common practice is to inject the absorbent oil through atomizer spray nozzles. The character of the oil usually employed is as follows: a kerosene distillate; color not material; Baume gravity, 36°-42° (corresponding sp. gr. 0.8448 to 0.8156); initial boiling point, 415° F. (213° C.). The oil, for best results, should have end point of final distillation not above 700° F. (360° C.), and should have a low viscosity factor.

The gas and oil move in counter-currents. The oil is drawn off continuously and passes through a recovery still where the light absorbed condensate is separated by distillation and re-condensation as gasoline. One and the same stock of absorbent oil is used continuously and requires very little replenishing, in some cases none. It will be seen, therefore, that the absorption method involves the use of a steam plant, as the distillation recovery is conducted with a steam still, and various circulating pumps are required. To date, the apparatus and equipment in use for absorption has not been generally standardized and is in the state of energetic evolution.

A comparison of the relative merits and details of the two systems of operation will be of interest. A clean-cut and exact comparison cannot be made of all the features to be considered, since, as stated, the absorption system is considerably behind the compression system in its present stage of development as against its anticipated possibilities. Enough can be seen, however, to indicate that the two systems operating in competition will be fairly evenly balanced with reference to operating cost, and when all refinements are applied in either case, it is the writer's judgment that the compression system will be found preferable.

Compression System	Absorption System
(*a*) System is now well standardized. Gas-engine power equipment and compressors designed especially for the work are available. The range of operating pressure is also standardized and plans for development definite estimates and are a simple matter.	(*a*) System not so well standardized. In fact, is in process of development and evolution to working standards.
(*b*) Condensing equipment, such as oil separators, condenser coils, accumulators and various details are well standardized.	(*b*) In absorption systems corresponding details are not yet developed to approach acceptable standards. Absorbers of about three distinctive types are exploited. Some details of refinement are to be worked out with reference to absorbent circulation that offer no apparent difficulty of solution.
(*c*) Operation requires skilled attendants familiar with the handling of gas compressors operating to 250-gage pressure.	(*c*) Practically the same limits obtain in absorption as in compression with exception that it appears likely that standards of operating pressure will be very materially lowered by comparison.
(*d*) Skilled and experienced attendants are required to handle a very volatile product. Treatment known as "weathering" involved. Use of steam required during cold weather. Storage of unweathered manufactured product requires especially constructed tankage.	(*d*) Steam boilers and stills required to be maintained in continuous operation. Product as afforded by methods developed to present date less volatile than in compression system. Storage tankage of a cheaper class is being used. It is most likely, however, that improvements or further refinements in absorption system will bring about condition parallel to

The red-tape worm devours about half the time of every organization.—Herbert Kaufman

Compression System	Absorption System
	compression system in nature and volatility of product This development will follow because of possible increase by such development of sufficiently greater output to justify such refinement
(e) Gas must be treated under artificial pressure	(e) Gas may be treated under natural well pressure
(f) Additional machinery almost invariably used for producing vacuum	(f) It has not yet been determined that vacuum applied to gas well not producing oil can be profitable
(g) Compression system admirably adapted to rich casing head or oil well gases	(g) Absorption system adapted to dry gas or oil well gases of lean saturation
(h) Investment for plant equipment required under most favorable conditions basis of cu M cu ft unit capacity gas treatment approximately $ per cu m	(h) For comparison of most favorable conditions for cu M cu ft unit capacity $ per cu m
In terms of manufactured product per unit barrel of 10 gal above figure will reduce to $ per cu m	In terms of manufactured product per unit barrel of 10 gal above figure will reduce to $ per cu m
(i) Maintenance and upkeep depreciation insurance and taxes classify about as oil refinery operation	(i) Comparable to compression
(j) These all extracts a very efficiency admittedly short of possible recovery by margin amounting to from to gal per cu m cu ft unless tail gas refrigeration be used adding about per cent to cost	(j) System should attain practically per cent recovery of extraction product provided steam stills are operated under pressure or small compressors be employed for the purpose of recovering light steam still production This application has not been generally made to date It may be assumed that the loss due to escaping light gasoline is greater than the admitted loss in refinery of the compression system Corrective measures can be applied at a cost within per cent of total investment
(k) Value of manufactured product in per gallon in blended state operation Difference at plant adds to the per cent to cover all economies as against present when filtering is used to separate	(k) Practically same as compression

Costs of operation involving salaries of attendants lubricants waste and plant supplies will be about equal

In the case of the simple battery of absorption equipment with a recovery still interposed in a pressure gas main, the skill required on the part of the plant operatives may be less than in the case of a compression plant involving all its branches and details when developed to the full extent It is also likely that a greater degree of skill on the part of attendants will be required for absorption operation in which vacuum and compression are also used, for the reason that the details of operation are somewhat more extended However, this difference will not be material

It will be understood in this connection that the absorption system is being exploited in competition with the compression system for the working of rich casing head or oil-well gases, and when so applied practically all of the refinements and ramifications of the compression system are involved and the only material advantage to be gained is the possibility of operating on gases with a wide variance of saturation with one and the same system without results detrimental to the yield from the rich gases by presence of the lean gases in preponderance

Many cases arise, particularly in the drilling of new oil properties, where gases of mean low saturation value say from $\frac{1}{2}$ to $1\frac{1}{4}$ gal per 1,000 cu ft must be left out of the operating system because of the reduced partial pressure factor and the consequent lowering of yield efficiency of the over all plant output

Wastes are sustained in this way that can otherwise be avoided This phase of discussion applies to the development of new oil fields rather than to old developed areas A problem very difficult of solution is offered in this particular phase of oil operation The great Cushing pool may be cited as a material illustration Oil wells in great number came in this field delivering at the same time hundreds of thousands and even millions of cubic feet of gas of low gasoline saturation daily This output of gas of course was of short duration as the producing area was drilled in locations sufficiently close together to exhaust the sands of the great gas deposit at a rapid rate In a period of from three to six months the wells settled down in casing head gas volume to averages of from to cu ft to to cu ft daily The only way to obtain the oil is to allow the gas to escape with the drilling mud The problem of separation of the gas from the oil is not serious But the investment involved to provide either compression or absorption equipment for the economic handling volumes of gas thereafter would admittedly be so heavy as to make the recovery of the necessary investment within any reasonable time somewhat questionable Recently the matter of rapid absorption separation at the well of natural gasoline from the heavy gasoline bodies after the mixture with dry gas and the two have been subjected to the pressure

And all may do what has by man been done —Young

admit a concentration of the heavy gasoline vapors and their separation from the total gas output of the well with rejection and delivery of the lighter gases to any desired channel. If successful application can be made, it will be comparable to the concentration of metallic ores, which has, in many cases, so successfully solved low-grade ore problems.

A few essentials of the technique of gasoline plant operation are well worth noting. The effect of the presence of lean gas in a compression operation and its reduction of the plant yield from rich gases, or gases of high saturation, has been mentioned. This is due to the fact established in practice that an operating pressure of 250 lb. per square inch is not sufficient for adequate removal of gasoline hydrocarbons, but in many cases will allow as much as ½ gal. of product to escape in the residue or tail gas. It is not, therefore, an approved commercial practice to mix gases of saturation below about 1 gal. per 1,000 cu. ft. with gases of high saturation, around 3 or 4 gal. per 1,000 cu. ft., except in such proportions that the higher saturated gas is in excess.

The dilution of gas with air is equally detrimental; it is a difficult and tedious matter requiring constant attention, where heavy vacuum is applied to the wells, to prevent undesirable amounts of air from being drawn in through leakage. A simple apparatus of the Orsat type is used and the amount of oxygen present in the gas is frequently checked under efficient management.

Very recently automatic oxygen recorders have been worked out and are being applied. Occasionally conditions may be met in which the gas being used is contaminated to a greater or less extent with carbonic acid. Phosphorus cannot be successfully used as an absorbent reagent for oxygen in a gaseous mixture containing a hydrocarbon of the petroleum series. Gas analysis is also used to locate the source of the air leakage. The necessity for taking samples of gas from the pipe lines under a sustained vacuum as high as 27 in. of mercury involves difficulties which can be appreciated only by one who has attempted to secure concordant results under such conditions. Very largely, the work has to be done by men who have not had laboratory experience and who have been hurriedly instructed in the manipulation of the apparatus. Unusual courage and determination to overcome the vexatious little obstacles of the industry are seen on every hand among the oil operators and investors who have entered this field of the industry.

The paramount feature of commercial interest toward which the casing-head gasoline industry has undoubtedly contributed in a large way is the favorable acceptance by the consumers of motor fuel having an unprecedentedly high distillation end point; in other words, carrying a heavy percentage of a product which in reality approaches the character of kerosene. In the very beginning of the casing-head gas industry it was found practical to use, by mixing or blending with the casing-head product, a large percentage of what was known as painter's naphtha. This product alone could not be successfully used in a motor because of the difficulty in getting the motor started, but, long before the day of starting our motors from the seat by electric storage batteries, casing-head gasoline had made their starting by hand possible by giving to the heavy product a light, readily vaporizable fraction.

This starting difficulty was the only obstacle to be overcome in the use of the naphtha as a satisfactory motor fuel. Elaboration and extension of this application resulted largely, no doubt, in encouraging, first, the destructive distillation of petroleum or its residues, and, more recently, a concentrated effort to treat the kerosene distillate crude fraction in the same manner.

Efforts are being concentrated by every progressive refiner on the problem of destructive redistillation of kerosene distillates, which amount to a large fraction of the crude. Sufficient success and encouragement has been reached in this direction to insure that within the near future all excess kerosene distillates will be treated in this fashion. It is now evident that from 25 to 50 per cent. of such distillates can be economically converted for use as motor fuel or can be used by blending with casing-head gasoline. This will add to the total gasoline supply an amount equivalent to an increase of 10 per cent. in our total crude-oil production.

PICTURING ONE'S FACE IN ADVERTISING.

WE have seen on bill-boards, pictures of a face from the mouth of which protrudes a cigar. That cigar may be perhaps the best cigar ever made, but from the standpoint of some men, it would never be purchased, because of the character of the face on the bill-board.

Before one uses a face or a portrait in advertising, he should be sure that the features and characteristics of the face would lend to, rather than detract from the strength of the advertisement. We have in mind one advertisement that we have seen in various magazines that in every case to our notion has proven *good*. The portrait is that of the manufacturers' face, one that would at once give the prospective purchaser confidence in the product.

Secondly, the reading matter in these advertisements to which we refer is clever, and thirdly, a good slogan has been adopted. It is direct and to the point, and should attract the attention of fitters and those at the head of fitters' shops. The slogan reads, "Say Nye Dies."—Make your advertising *feature advertising*. And make every feature featured, tell to the good. Trade names are good as are slogans that may be tied to the article, or that may tie the article to the maker, in the minds of possible buyers.

We join ourselves to no party that does not carry the flag and keep step to the music of the union. —Choate

Gas Difficulties Disclosed

Three Score Newspapers Tell Consumers of Difficulties in Maintaining Adequate Supply of Gas Under Adverse Weather Conditions.

IT has long been said that "Advertising pays." Manufacturers have advertised with wonderful effect. Merchants have advertised and built businesses. Churches advertise and fill their pews. Banks and trust companies advertise as never before. It's an age of telling others that which one knows, has to offer and of which others should become possessed.

Never has there been in the field of natural or artificial gas a more active enterprise than the enterprise bearing the name of Henry L. Doherty, or Doherty interests under whatever title they may appear.

Henry L. Doherty is an advertiser. He tells others that which they should know. He is a believer in publicity, and versus a few years since when Henry L. Doherty worked in the gas house he is today at the head of vast interests in the field of natural gas, artificial gas, electric traction and water power.

We are not eulogizing Mr. Doherty. That is not our attempt. He does not need that type of publicity since those in the gas field already know what vast things Mr. Doherty interests stand for and what marvels he has achieved. This article is intended to show to other gas interests how the Doherty interests have sought to educate the public through paid publicity.

Many public utilities as well as manufacturing enterprises, are ever seeking publicity without paying for it. They do not hesitate to ask publishers to print articles and notices regarding things of one sort and another that they claim are items of interest and therefore should appear in the reading columns of publications when they know as well as the publisher that the only reason they are handing this matter to the publisher is that they may secure free publicity.

It would be rather interesting to meet a person who could honestly say that those handing out such matter as we have described had done so or had sought to do so for the public good because the matter was educational and would be helpful. Ostensibly matter is held out for that reason but frankly the handler out hopes for free publicity.

The Henry L. Doherty interests over the title of Kansas Natural Gas Company did not seek to fool the public by causing it to think that some editor had prepared certain matter that the publisher said as news, but the institution bought space and paid for it and used it in a frank straightforward manner. We do not wish to indicate that we have [illegible] faith in any one. We have not [illegible] many others just as frank and square as the Doherty interests, but we are using these specific interests as our example in view of the fact of certain instances where these interests did clever work that has come directly under our attention.

One of the Doherty interests in discussing the advertisement to which we are referring made the following statement:

"For nearly two months the natural gas properties of the Empire Gas & Fuel Company have been issuing a series of advertisements which are totally different from any advertising ever attempted by a similar concern. The advertisements issued from the Kansas City office of the company under the direction of R. L. Morrison, Doherty representative in that city, strike a new note in publicity. The advertisements have [illegible] and have done [illegible] Kansas the exact [illegible] natural gas industry [illegible] advertising would [illegible]

[illegible] sixty newspapers [illegible] the towns in [illegible] the Wichita [illegible] Natural Gas Company [illegible] business. In [illegible] has been [illegible]

[illegible] the [illegible] advertising campaign [illegible]

To succeed you must do things better than anyone about you. C. M. Schwab

advertising, and adding that the public is appreciating the attempt to describe the difficulties and hard labor necessary to furnish a supply of natural gas to a city.

"One of the novelties of the advertising is the printing of a daily weather report immediately under the headline of the advertisement, thus adding to the drawing-power of the ad.

"There is only one way to get an adequate idea of the original advertising campaign, and that is by reading the advertisements themselves. Each contains some matter which will undoubtedly be of interest, not only from the advertising point of view, but also from the natural gas and oil standpoint. Lots of things mentioned in the copy are news to many, and it is unfortunate that all the ads run thus far cannot be

THROUGH SNOW AND MUD TO LAY PIPE.

WEATHER REPORT.

Kansas City and vicinity (radius 20 miles)—Generally fair and somewhat warmer Monday; unsettled Tuesday.

Continued zero weather, interrupted by short periods of sunshine and moderation, has had a marked influence on the resumption of the new pipeline to the Blackwell, Okla., gas field, completion of which was in sight when the storm came.

In addition to clearing roads for stretches of several miles, the snow had to be shoveled from the completed ditch, which was found drifted level full, before pipe laying could proceed. When the weather moderated for a few hours and the crust of ice yielded, the men worked in cold slime, or winter mud, about which we hear so much from the trenches in France.

Figures can express little of the hardships that are being endured in the great effort of the men to finish their work. However, the last report from the field showed the ditching machine had traveled one-third mile since the storm. Teams had been able to haul 1¼ miles of pipe to the scene of the work, and pipe layers had proceeded but one-fourth mile. That progress was snail-like in comparison to what was done before the storm, but the men were working harder, if that were possible, than when the weather was with them.

KANSAS NATURAL GAS CO.

A SAMPLE NATURAL GAS ADVERTISEMENT.

reproduced. The next best thing is to reprint some of the advertisements, and from them one can gain a good idea of the quality of the matter run and the novelty of presentation. Following is one of the advertisements, called 'Guardians of Gas Service':"

> Just as railroads employ trackwalkers to make painstaking inspections of their right-of-way, so the pipeline company that supplies your gas has linewalkers for every mile of its lines. It is a lonesome job, but one highly specialized and essential to giving you good service.
>
> The linewalkers search for leaks. Leaks cannot be avoided. They are inevitable.
>
> The question naturally arises, "How does the linewalker locate a leak in a pipeline buried several feet under ground?" Perhaps most leaks are found through the smell of the escaping gas. Others make a sound—half whistle and half hiss. Experienced linewalkers often find leaks through the peculiar appearance of the vegetation nearby, and sometimes a swarm of big green flies tells them where gas is escaping. That type of fly has a peculiar affinity for natural gas.
>
> The leak located, the linewalker digs down to the line with the digging tools he carries. If the leak is small he often mends it himself. If it is too large for him to handle—but space compels that you be told that tomorrow.

"Dynamite Rips Way for Pipeline" is the name of the following advertisement, which appeared in the sixty newspapers on November 2:

> By the time the new pipelines now being laid are completed, twenty-five tons of dynamite and 140,000 percussion caps will have been used in the effort to get more gas to you. You now have a better idea of the obstacle presented by the rocky hills through which the lines pass, and through which a trench for the pipe must be blasted.
>
> For the 43-mile line to the Blackwell field—half of which is in hilly country—a ditch 26 inches wide and 44 inches deep is required for the 16-inch pipe.
>
> It is not necessary to blast twice in most places in order to reach the required depth. The electric drills work some distance ahead of the blasting gang, preparing holes for the dynamite. Twenty "shots" are fired at one time.

The following advertisement shows how the character of the ads was varied. This interesting story emphasizes more than a long list of statistics the hard work necessary to push through the big job. This one is headed "Two Hundred Miles in the Night to Speed Gas":

> The difficulties of constructing 90 miles of gas pipeline in four months will be appreciated better if one of many incidents that arise is cited.
>
> At 4 o'clock one day last week the supply of percussion caps used in blasting was exhausted, and an expected shipment had not arrived. The lack of caps threatened to halt the work of ditching. Ross M. Stuntz, who is in charge of the work, received long distance telephone notice of the shortage in Bartlesville at 6 o'clock that night. Much telephoning developed that the nearest supply of caps was in Pittsburgh, Kans. He caught his assistant by telephone at Chanute, dispatched him to Pittsburgh, 70 miles away, in a motor car. Five thousand caps were loaded in this car and taken that night 200 miles to Burden, Kans., arriving there in time for the men to go to work at 8 o'clock the following morning.
>
> That is only one of many things that characterizes the high efficiency of the organization that is doing everything that it can to deliver more gas to its patrons for this winter's use.

Throughout the series there is more or less attention paid to the ever-popular topic of conversation—the war. An example of that kind of ad is the following called "Ditching Machine a 'Tank' of Peace":

> The big ditching machine that began on October 27 to open a way for the gas pipeline extension to Blackwell, Okla., field, is a "tank" of peace. It strongly reminds one of the big "tanks" that have wrought such havoc on the battlefields of Europe, but its mission in the world is a far different one.

The truth is always the strongest argument.—Sophocles

It is propelled by the same kind of wheels—the 'caterpillar' type, and it goes about its work as methodically and efficiently as does its military cousin. Just now it is cutting a trench 36 inches wide and 44 inches deep, but the shovels on the big cutting device are adjustable and it is capable of making a ditch 5 feet wide and 6 feet deep.

Not long will it remain a "tank" of peace, for other machines of its type, made by the same manufacturer, will shortly start digging trenches for the Allies on European battlefields.

One of the most elaborate advertisements run in the series talked of Henry L. Doherty and his work in the gas business. The advertisement, longer than the usual daily copy, consisted chiefly of comment by the mayor of Topeka, Kans., who called Mr. Doherty "The Gas Moses."

Jay F. House, Mayor of Topeka, Kans., and special writer on the staff of the Topeka Daily Capital, has the following to say of the gas situation in his column, "On Second Thought":

"Going to and from upon the street cars and farming forth, as we do now and anon, into the busy marts of local commerce, we hear much talk about the gas situation. Most of the talk is based either upon misinformation or ignorance of conditions. Most of it is in criticism either of the gas company or of local authorities.

"We probably know as much about the gas situation as anybody in Topeka. In the last year or two we have taken some pains to acquaint ourself with it. We have attended half a dozen conferences at which all the divergent interests in the gas situation were represented, and we are familiar with all of the claims and counter claims.

"Here then is our opinion of the gas situation briefly expressed. You may take it or leave it. The Henry L. Doherty Company is spending somewhere between two and three million dollars in an effort to extend the mains of the Kansas Natural into producing territory. Mr. Doherty is one of the Wall Street octopi and a shrewd business man. If he did not believe he could increase the supply of gas he wouldn't be spending all that money. Doherty is the 'Moses' of the situation.

"If anybody can get more gas Doherty can. If Doherty can't get it the jig is up and you might as well scrap your gas range.

"We have an idea the gas situation is going to improve. There will be more gas this winter than there was last. But there won't be enough this year to supply the demand for it. Probably there never will be enough. But Doherty is in the business to sell gas. And any time he is able to locate a promising source of supply he'll spend the necessary coin to push the mains to it.

"Meanwhile the supply of gas can not be increased by ordinance petition or criticism. We offer that as a pronouncement. And as we have hitherto intimated you may take it or leave it."

THE OTOE-MORRISON FIELD

BY MATT IRWIN

JUST when the oil and gas wells of the Shamrock-Drumright-Tiger Creek fields seemed to be nearing exhaustion, production rich deposits of gas and oil were found in the Black Bear Creek valley and Otoe hills. The Otoe-Morrison gas field is in southeastern Noble County, Oklahoma, about the same distance from Stillwater, Ponca, Perry and Pawnee. Four gas wells have been completed in this field yielding 140,000,000 cubic feet of gas daily. Five additional wells are drilling. The successful completion of these additional wells in the Otoe-Morrison field will provide sufficient gas for many cities, towns and villages in the state. It is to the credit of those in charge of the development work in the Otoe-Morrison field that great care is reported in drilling, and no gas is allowed to be wasted.

Geologists, petrologists and gasologists find an interesting field for study in the great deposits of oil and gas in the Arkansas River and Cimarron River valleys and hills, and roundabout the tributaries of those streams.

Considerable of the Otoe-Morrison field is in the Otoe Indian Reservation. The Black Bear Creek runs through this great gas field. The source of supply of the Oklahoma Natural Gas Company was severely taxed during the recent cold wave, and the availability of gas from the Otoe-Morrison field prevented serious inconvenience on the part of the company's consumers.

King Blizzard and Jack Frost will receive a warm reception on their next visit in Oklahoma. Even thousands of farmers on the woodless and coalless prairies of Western Oklahoma are talking of having gas piped to their homes. It is a geological peculiarity that so much gas and oil should be found adjacent to the Oklahoma River in Oklahoma, and not much up and down that stream.

The Arkansas starts in Colorado and empties into the Mississippi where it is called Red River, but whether there are any oil and gas deposits near the Arkansas in Kansas and Arkansas development work up to the present has failed to prove.

ANNUAL REVIEW

[illegible]

THIS year [illegible] has seen the highest prices ever paid for crude in the western and southwestern fields, and the highest price in the eastern fields since the industry was of any size. It has been the largest consumption ever witnessed in the history of the oil industry, and notwithstanding the high prices for crude the production has not increased sufficiently to catch up with the consumption as in years past. Thus in spite of the fact that the largest number of wells ever completed in a single year were completed in 1917, covering a larger area of country. In fact the output will not come within 30 million barrels of supplying the demand. Does it mean that the United States has reached or nearly reached its producing limit as to quantity of production of crude oil? As the number of producing wells increases the production declines and more states the drilling of an additional number of wells each year to simply overcome the natural shrinkage alone without increasing the total output and with normal conditions.

NEW FIELDS

[illegible] witnessed the entrance of Wyoming as a real oil producing state with the birth of its production of good

grade paraffine base oil, high in gasoline content. Wyoming increased its potential production from 20,000 bbls. to an estimate of 50,000 barrels daily, but owing to its geographical position it cannot be utilized to its fullest extent, and while its most exuberant friends talk 100,000 barrels daily, the state will need pipe line connections with the east to be fully utilized. There are a number of producing sands and the territory is most promising for increasing production in the United States today, but with the present price of material the pipe lines will be delayed. On the other hand the daily production of 40,000 barrels would swamp the present railroad facilities in the Mid-Continent field. Kansas could increase its present production but owing to the inadequate pipe line facilities, and scarcity of material its production will not come so fast that it will not be absorbed. Oklahoma production as the trend goes west and southwest has become so deep and expensive that it will not be drilled quickly and the shallower pools do not have staying qualities. The Osage Nation probably offers the most attractive place for the wildcatter of moderate capital and is controlled by the government. The state will furnish many new pools and some new sands, but with the chances agaist finding another Glenn or Cushing pool.

Texas, outside of the Gulf Coastal fields is proving attractive. The wildcat element and several spots promise to develop into limited pools of light oil in west central Texas.

California has to a large extent lost the wildcatter and promoter, who have moved eastward to countries that are cheaper to test, and have not been exploited to as great extent, and this will mitigate against California increasing its present production to a great extent.

The Illinois, Ohio and the eastern fields developed nothing during 1917 that promises much production. Western Indiana and eastern Illinois developed several small, but paying pools that did not overcome the decline.

In West Virginia the Cabin Creek field was the largest discovery, promising about 5,000 barrels while in Pennsylvania a pool in Green County of rather spotty nature is still under development.

Kentucky has been the favorite eastern state on account of its shallow sand and low cost. The Irvine pool in Estell County and its extensions in Powell and Lee Counties have been the cause of new work starting in both the eastern and western parts of the state, and at several points there have been reported favorable showings which have not as yet stood the test of the gauge. Mexico during the year completed a number of large wells which in a few cases added new producing possibilities. However, it has been shown that the Mexican producing formations are very irregular and light wells can be found within one or two locations of gushers and where transportation is available. Our imports of 1917 with the limited number of tankers available will be 8,000,000 to 10,000,000 barrels more than 1916, and the largest interest in the oil industry in this country have increased their investment in Mexico during the year.

The refining capacity of the country has increased more rapidly than any previous year. There has been an improvement in gasoline by means of different processes and by blending, and it has been noticeable that the gravity is still getting on lower plane, but so far there has been little or no complaint by users. The coming year will doubtless see a largely increased consumption and a still lower grade, with the further development and use of the kerosene carburetor as a motive power on the heavy and slow-moving machines. The refining capacity now largely exceeds the production and the last half of the year has not been as profitable to refiners as the first half, owing to the advance in crude prices and in many cases the additional premiums range from 10 cents to 20 cents in the east and from 10 cents to as high as 50 cents per barrel in the west, added to the failure of advance prices of other manufactured products until late in the year. Those refiners owning sufficient cars to care for their business were able to make good profits on the same owing to their scarcity.

The year closed with oil securities at their lowest point, although many of the seasoned companies have paid the largest dividends in years.

NATURAL GAS SECURITIES.

The year has seen several consolidations, increased domestic consumption with increased prices, increased earnings from gasoline recovered by the absorption process. In some cases this additional earning was sufficient to pay the dividends on the stock and is becoming an important item with all large natural gas companies. Generally speaking, there has been no field developed during the past year that promises large future supplies. Some extensions to the old fields have been added in Ohio and several new pools have been opened in Oklahoma, but owing to the continual adding of new consumers by most all the companies, a shortage was noticeable both east and west during the first cold snap of the winter. Increased cost which can partially be met by increased prices with a declining supply may be expected. In the east none of the very deep wells drilled in several sections of the country have shown any deeper or new formations that give promise of future supply. Natural gas is a luxury, it should be conserved entirely for domestic supply, and not furnished to carbon black manufacturing plants or allowed to be exhausted in the air as it has been in the past.

In comparison with other securities the prices of natural gas stocks and bonds show a smaller per cent of shrinkage than any other class of securities.

CALENDAR OF YOUNGSTOWN SHEET AND TUBE COMPANY.

The Youngstown Sheet and Tube Company has presented its friends this year, as it has in the past, with a very handsome calendar of generous dimensions, making it a valuable addition to any office equipment. Each of the large leaves of the calendar shows in halftone reproduction views of the company's foundry in actual operation.

Things don't turn up until somebody turns them up.—James A. Garfield

Gas for Drying Food

The Preservation of Food Products by Drying — An Able Treatise on a Subject that is of National Importance by an Industrial Gas Appliance Expert.

BY GILBERT C. SHADWELL.

THE various methods of preserving foodstuffs are generally well known. They include (1) canning; (2) smoking, salting, etc.; (3) chemical preservation; (4) heating; (5) refrigerating; (6) pickling and (7) drying, dehydrating or desiccating. various sub-divisions of the above will doubtless occur to many, but this classification may be said to embrace the subject for the main part.

FIG. 1. A GAS HEATED PORTABLE SMOKE HOUSE FOR THE PRESERVATION OF MEAT PRODUCTS.

For centuries past, the hunter has stored the plentitude of one season against the need of the next by drying, smoking or salting his meat and fish; others have preserved milk in the form of cheese or have fermented grapes and other juices into wine. The writer has personally seen the Kaffirs of South Africa drying fish on the roofs of their "kraals" (or huts) in order to preserve it for future use, and although, owing to the ravages of flies and other insects, it did not appear very appetizing, it serves to show that it is inherent in man to store up out of plenty for use when paucity sets in. More than ever now do we need to take notice of this fact and govern ourselves accordingly.

Nature causes cyclic action in everything. Morning follows night; light succeeds darkness; all life has its inception, its growth and its decay, and that which is either growing or decayed will usually serve to support other life. Most plant life thrives on decayed animal or vegetable matter, but most animal life is best supported by emendatory materials. For our purpose, therefore, we have to consider strictly how we may best prevent decay in such food materials.

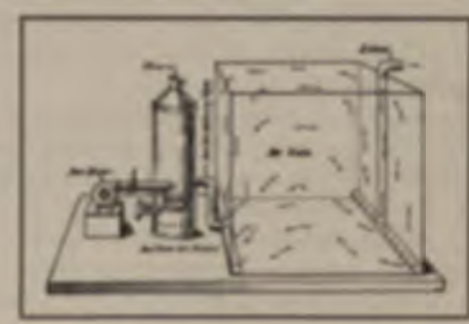


FIG. 2. METHOD OF DRYING BY BLOWING AIR THROUGH AIR HEATER AND DRY ROOM.

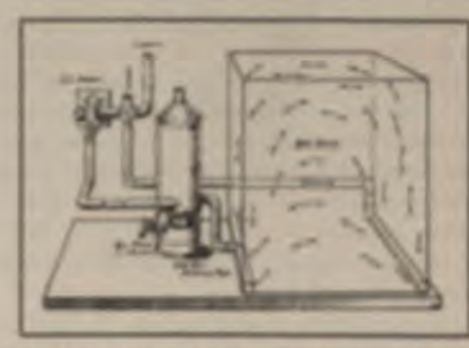


FIG. 3. RECIRCULATION METHOD OF CONNECTING BLOWER AND AIR HEATER TO DRY ROOM.

As long as the reasons for decomposition were unknown, all attempts at preservation were necessarily of and "cut and dry" order; but with modern knowledge the general principles involved are extremely simple. Very few organic materials will undergo decomposition or putrefaction without the aid of some foreign agency. They may lose water and some oleaginous substances may change by oxidation, but otherwise they are stable unless attacked by living organisms.

A substance in order to be a food material must be decomposable under the attack of a living organism. In fact, the decomposition of food stuffs is due to the development of living organisms within them. As long as

The way to resumption is to resume.—Chase

we keep such organisms away, the foodstuffs will keep pure and sweet, but as the air, our hands or in fact any outside agency, are contaminated with bacteria of many kinds, so it is essential to the preservation of foods that such organisms be excluded.

The preservation of a number of products is effected by heat alone. Few adult bacteria can live beyond 165 deg. fahr. in the presence of water, although dry heat alone only kills with certainty at about 285 deg. fahr. Destruction of such life takes place more rapidly in solutions showing an acid reaction. It is for this reason that acid fruit is more easily preserved than milk (because fresh milk is alkaline). Hence, we can sterilize foodstuffs by cooking them and they will remain sterile unless another crop of bacteria comes into contact with them. The methods of canning of such products are familiar to everyone and in such ways are the products maintained in a sterilized condition.

In preserving foodstuffs by chemical, sugar, salt, etc., are used. Other agencies were employed for a time, such as salicylic and benzoic acids, but their use is now almost universally prohibited, owing to their deleterious and injurious properties and their bad effect on the human digestive system.

The preservation of food by refrigeration is outside the scope of this paper. There are so many works of reference on the subject that it would be superfluous to treat of it at this time, except to state that at about 32 deg. fahr., fungoid organisms can neither grow nor multiply. Refrigeration, therefore, affords a means of keeping raw food in a preserved condition for a reasonable length of time.

Among the general forms of food preservation above referred to, however, that of drying is at present of the greatest importance. Foremost among the drying operations is that of the preservation of certain meat products such as hams, bacon, sausage, etc., by drying and smoking. These are usually treated in smoke houses which may be of either the stationary or portable type. Portable smoke houses are generally employed where small quantities of meats are to be smoked at a time and are usually constructed of sheet steel, whereas those of the stationary type are usually built of brick or concrete and are of many styles and types.

One type of gas-heated portable smoke house is shown in Fig. 1 and the details as to sizes, etc., in which they are made is given in Table 1. This smoke house is so designed that the smoke may be sent through the meats, or deflected into the flue at will. Sausages and meats may, therefore, be left hanging in the house without getting more smoke than necessary.

No smoke escapes into the room when the door is opened; there are smoke shutters over the sawdust pan operated by a bracket near the lower latch of the door, so that, when the door is closed, the operation of pulling down the handle to close the latch forces this bracket down and opens the shutters, permitting the smoke to pass into the smoking chamber. When the handle of the door is partly raised the bracket rises with it, closing the smoke shutters, and, at the same time, leaving the door fastened, and the flue damper opens as the shutters

TABLE 1. DETAILS OF USUAL SIZES OF PORTABLE SMO HOUSES.

Height	Width	Depth	(cu. ft.) Capacity	Weight, lb. Shipping	Maximum Gas Consumption per hr.) (cu. ft.
	Dimensions in ft.				
8	3	3	49½	480	100
8	4	3	66	560	125
7	3	2	27	312	60
8	3	2	33	390	80

The height from the bottom of the smoke house to the grate is 30 in. in each case. The capacities shown above do not include the space below the grate.

close, thus sending all smoke from the generator directly into the chimney. The small draft door is then opened which admits air into the smoking compartment to blow out the smoke. One minute after this has been done the main smoke house door may be opened.

The generator compartment contains the sawdust pan and gas burners. The latter are so designed as to give no smoke with a high heat, a heavy smoke with a low heat, or any stage between these two extremes. This is accomplished by having four burners—two under the pan, and two at the sides. The pan slides on runners so that it may be conveniently removed to dump the ashes. Angle iron flanges along the sides of the smoke house supply supports for bars on which to hang the meat. A strong wire screen is placed over the shutters. This prevents meats from dropping upon the shutters or into the sawdust pan. A thermometer is an important adjunct to any smoke house where it is desired to do the best work, and where it is important to turn out uniform goods.

Cured meats, after being soaked to remove surplus salt, should hang several hours until they stop dripping.

TABLE 2. SMOKING AND COOKING SCHEDULE FOR DOMESTIC SAUSAGE.

Name of Sausage	Smoking Hr.	Smoking Temp. F.	Cooking Hr.	Cooking Temp. F.
Long Bologna	3	145-150	½	160
Large Bologna	3	145-150	2	160
Round Bologna	2	135-140	½	155
Bag Bologna	1	140-145	2	160
Bologna in weasands	4	185	¾	155
Knoblauch	1-1½	130	½	160
Leona Bologna, long	3	145	¾	155
Leona Bologna, large	3	145	2	160
Frankfurts	2½-3	130-135	1/10	160
Vienna Frankfurts	3	140-145	1/10	160
High grade Frankfurts	3-3½	150-160	1/10	160
Tongue	12	65- 70	2	200
Liver	1-1½	110-120	½	160
Polish	3-3½	150-160	†	...
Minced Ham	3-3½	135	4	150
Berlin Ham	5	130-140	2	170
Cooked pressed Ham	5	130-140	2½	180
Cottage Ham	32	120	†	...
Boneless Ham	48	120	†	...

The smoke house should then be warmed to about 115 deg. fahr. so as to dry the surface of the meats until they have a glazed appearance; this will require several

To do two things at once is to do neither.—Syrus

are more [illegible]. The outer or side burners may be used for this purpose as they do not heat the sawdust pan. After the meats are thoroughly dried the burners under the sawdust pan should be lighted (using hardwood sawdust) and the temperature allowed to rise gradually to 118 deg fahr in 10 or 12 hours. Sweet pickle meats should be smoked 24 to 30 hours. The meats should be allowed to cool off thoroughly with the ventilator open before removing them from the house. Meats should be handled as little as possible after smoking.

Boiled hams should soak at about 160 deg fahr for two hours to remove surplus salt; they should then be cooked for 4 or 5 hours at 160 deg fahr and allowed to [illegible] in the water in which they are cooked so as to reabsorb some of the weight lost in cooking. They should then hang until the meat stops dripping and be dried thoroughly in the smoke house at about 118 deg fahr before smoking. They should then be smoked very lightly. Hams shrink less if cooked before smoking than if cooked afterwards.

Dried beef should hang in the smoke house at 135 deg fahr for 24 to 48 hours to dry thoroughly before smoking. Then the beef should be given a heavy smoke, after which it should be [illegible] and allowed to hang for 24 hours before handling [illegible].

Puffy meats result from smoking before the meat is thoroughly cured. In this case fermentation takes place when the heat is applied and gases are produced in the meats.

Several [illegible] gas generating [illegible] have been [illegible] appliances which can be adapted [illegible] widely used [illegible] about the burners [illegible] fastened to the burners. [illegible] which becomes heated [illegible] beneath it. The burners are [illegible] blast burners and are hexagonal head [illegible] slightly staggered [illegible] operated either by [illegible] pressure blowers.

In operating this appliance the burners [illegible] are [illegible] a pilot heat the smoke house. After the house has been heated and the meats dried [illegible] sawdust can be shovelled on to the plate. [illegible] allow the sawdust to burn evenly. Ashes can accumulate at the bottom without interfering with the operation of the burners as the appliance [illegible] and being raised off the floor the burners [illegible] seen in operation.

Food materials in which there [illegible] per cent of water are almost [illegible] bacterial growth. An example [illegible] nature preserves the germs in seeds [illegible] material which would [illegible] material but which are [illegible] nature [illegible] foods as eggs [illegible] after [illegible] and to keep [illegible]

What [illegible] eggs [illegible] every other food [illegible] grapes [illegible] cabbage, spinach, potatoes, etc. Most fruits and vegetables contain quite a large percentage of water. [illegible] for example [illegible] per cent of solid matter. [illegible] dried for preserving [illegible] weight [illegible] about [illegible] farmers.

[illegible] a warm [illegible] hot water [illegible] however [illegible] deg fahr [illegible] larger part of the water [illegible] the [illegible] otherwise [illegible]

After [illegible] will be [illegible] stage the temperature [illegible] deg fahr [illegible] even as [illegible] deg fahr [illegible]

[illegible]

[illegible]

Patience is the best remedy for every trouble.—Plautus

however, involve a particular design for almost every installation and a description of each would clearly be outside the scope of the present paper. It is hoped, however, that this short discussion will be of assistance to those who are planning work of this nature in these present times of stress.

——Presented before Semi-Annual Meeting of The American Society of Heating and Ventilating Engineers, Chicago, Ill. Cuts by Courtesy of the Society.

SHABBY OVERCOATS AS BADGES OF HONOR.

RECENTLY a statement was made by Frank A. Vanderlip, so the daily papers reported, that pleasures should be forgotten during the war, to a large extent, and the money be invested in war saving stamps, or other government securities.

We disagree with Mr. Vanderlip in his statement that "pleasures should be forgotten during the war to a large extent." Instead, let us say that unwise and uncurbed pleasures should be eliminated, but that pleasures and pleasures in the broad sense of the word should be encouraged. They are a relief from the pressure that comes with the leaving of home by our young men, and the contemplating of the risks that we know they are taking, etc., etc.

Mr. Vanderlip advises that we should not buy a theatre ticket or a movie ticket. How unwise in our opinion would this be if followed literally, while instead, the somewhat more moderate buying of amusement tickets versus indiscriminate buying, is the way this thing should be put to the public.

We should not desire our show-houses to go out of business, and our actors who have purchased Liberty Bonds on the installment plan, to have their income cut off. We must not go "hammer-and-tongs" at matters, we must use thoughtful care in making our suggestions as well as our expenditures.

Then again, Mr. Vanderlip says, that the shabby overcoat is a badge of honor. We differ with Mr. Vanderlip. In other words, we do not believe that "shabby" anything, was ever a creditable badge of anything. As a rule, that which is shabby is the result of lack of thrift, and how unreasonable it would be for us to go to extremes, and as the slang has it, put our clothing establishments "on the blink," the millions of employes back of which are Liberty Bond subscribers on the installment plan, loyal folk, government and home supporters.

Garments should, in war times as in peace, fill the function of neatness as well as utility. Foppishness should be frowned upon, but the substantial garment is the means and the evidence of money-circulation.

Avoid excesses, both in what we say and what we do, yet extremes upon the other side are undesirable, so let's be sane and sensible. What we need is poise. "Don't rock the boat."—The Editor.

ELIAS H. LONG, DECEASED.

FOR many years Mr. Elias A. Long conducted and edited the Acetylene Journal of Chicago, published not only in the interests of acetylene, but as well in the interests of the International Acetylene Association, directly representing the Association in print, yet at the same time conducted with that freedom of speech and justice to all, that was universally found a fundamental principle in Mr. Long's work.

For quite a period Mr. Long had been incapacitated for business, through a lingering illness, and as a consequence, for a long period has been missed by a large circle of acetylene friends that formerly gathered about the man whose *self* was lost sight of in his love for, and untiring zeal in behalf of, the acetylene industry collectively, and the manufacturers of apparatus and the manufacturers of carbide, individually. These the makers and builders of that industry, though, as it might be said, the work of the Acetylene Journal was the cement that helped to bind these integral parts into one solid structure.

Mr. Long died on Christmas evening at Sioux City, Ia., at the home of his daughter, though the interment was at Buffalo, N. Y., where Mr. Long in his earlier life, always a lover of flowers and the beautiful, conducted that which was then Buffalo's leading floral store.

The Journal, after Mr. Long relinquished his connection continued along the lines formerly laid, until at a more recent date, the oxweld-acetylene industry having developed to large proportions, the Journal added a department especially devoted to that arm of the industry.

The Acetylene Journal has always born the stamp of "right," an imprint of Mr. Long's own personality. The Journal for some time past, in fact since Mr. Long's illness overtook him, has been under the management of Mr. R. W. Hume.

M. G. REYNOLDS PASSES AWAY.

IT is with deep regret and sincere feelings of sadness that we recount the death of Mr. M. G. Reynolds, President and General Manager of the Reynolds Gas Regulator Company of Anderson, Ind. Mr. Reynolds founded this business years since, and under his guidance, and by reason of honest methods and honest product, developed it into an affair of large proportions. Mr. Reynolds was an able man in his profession; he made many friends in the field.

Some time ago Mr. Reynolds associated with him Mr. J. C. Groble as Vice-President and Assistant Manager, a man of wide experience and a fund of valuable knowledge as applied to gas conditions and appliances. Mr. Groble's experience has assisted and will continue to be of valuable assistance in the business that Mr. Reynolds' experience, tact and ability has built into a lasting concern.

Many personal friends will sadly regret to learn that Mr. Reynolds passed away on the afternoon of December 12th. The passing away was quite sudden.

The world is a wheel, and it will come round right.—Disraeli

Heat Insurance

A Gas Furnace with Coal Burning Unit Insures Constant Service Through the Severest Winter Weather.

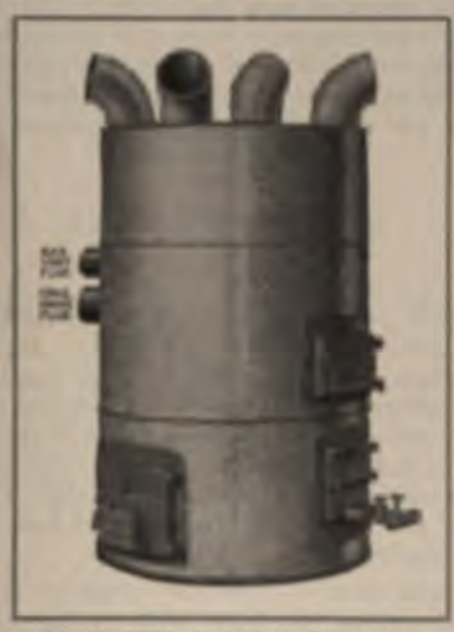
BY F. R. HUTCHINSON.

COAL is high in price, deliveries in cold weather uncertain.

Manufactured gas, always available, but usually even higher in price than coal for house heating.

Natural gas inexpensive, but, due chiefly to increased demand, because of high price and trouble in promptly securing coal in cold weather, subject to interruptions in abundant supply.

Householders employing warm air heat may now procure, for the first time, a warm air furnace that economically and efficiently burns coal or coke and gas as well, separately or together.



DUAL FUEL GAS-COAL FURNACE.

All so-called, combination warm air house heating furnaces, manufactured up to present writing, have been designed primarily as a coal, secondarily as a gas furnace.

They are usually entirely suitable for coal, but wastefully extravagant when gas is used for fuel.

This is occasioned through the fact that the fire travel, from grate to flue outlet is necessarily short in order to not impede draft when coal first is burning.

It is because of this short fire travel, usually ranging from six to ten feet, that no economy with gas can be obtained, no matter how perfect gas may be consumed, for the products escape and heat is lost up the chimney.

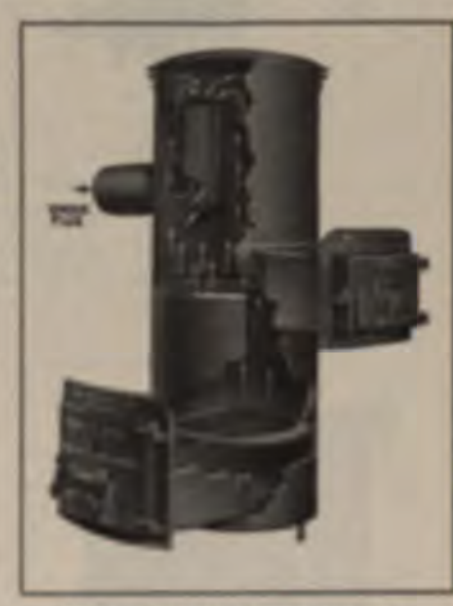
Illustration pictures the new patented High Efficiency Dual Fuel Gas-Coal Warm Air House Heating Furnaces now on the market.

You will observe it is provided in front with coal and gas fire doors, at side with ash pit door and in rear with two flue outlets, one each for coal and gas.

The casing contains two units, an economical gas furnace, an efficient coal furnace of equal capacity.

Gas, or coal or coke can be burned separately or together.

Within the same casing there are separate fire pots, radiators and flue outlets for coal and for gas, one having no connection with the other, and each unit of carefully designed construction for the most efficient use of the two fuels.



COAL UNIT OF NEW FURNACE.

THE COAL FURNACE

The coal furnace is of standard construction and suitable for the use of hard or soft coal, coke or wood.

It may also be used as a rubbish burner.

The triangular bar grate may be removed through the ash pit door opening.

The firepot is of heavy cast iron, made in sections, and, in case renewal is required after years of service, replacement may be made through the fire door.

The radiator is of heavy steel plate and all parts have been carefully designed to give strength, efficiency and ease in operation.

Revolutions never go backward.—Phillips

Openings are provided in fire door for the insertion in the fire pot of a coil for heating water, for bath and other domestic purposes.

THE GAS FURNACE.

The gas furnace is entirely separate from the coal furnace and, when installed, it surrounds the coal furnace as indicated in illustration following:

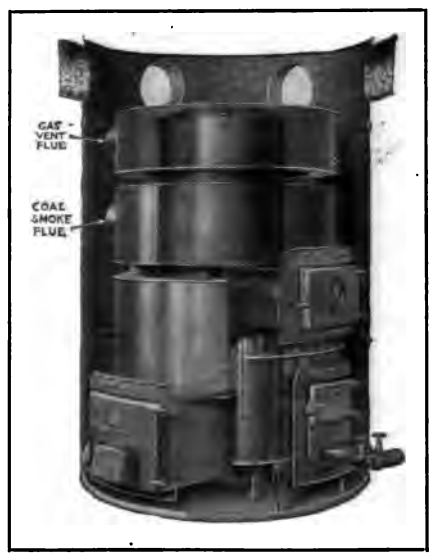
GAS AND COAL FURNACES WITHOUT CASING.

The gas furnace has a corrugated cast iron burner pot, to assure durability, the burner pot surrounding two powerful cast iron drilled burners.

GAS UNIT OF NEW FURNACE.

From the burners, the products of combustion pass through the burner pot and into the three radiators above it, encircling each radiator on their way to the vent flue.

In this manner the long fire travel which is so necessary to secure "high efficiency" in the use of gas is secured.



DUAL FUEL FURNACE WITHOUT CASING.

The radiators are made of heavy rust resisting iron, each joint and seam tightly made to prevent any possibility of the escape of burned gases into the warm air chamber.

Companies selling manufactured gas at a price not exceeding sixty cents per thousand would profit by investigating this new furnace for much added consumption could be obtained on off peak loads, Spring and Fall, through such an installation, coal could and probably would be employed for fuel during mid-winter months.

Gas companies selling manufactured gas at forty cents or less for heating could, if desired, doubtless obtain all winter consumption with present high coal prices.

During normal coal and coke prices and demand, those artificial gas companies seeking a market for both gas and coke could, through this dual fuel furnace, by naming and advertising it as a gas-coke furnace, assist sales of both coke and gas and price of gas could be locally made to invite off peak load for gas,—peak for coke.

In many cities provided with natural gas, supply was low and service interrupted last winter, chiefly because of unusual demand.

Patrons using burners in coal furnaces and those using independent gas furnaces suffered temporarily during days of severe cold through inadequate supply.

With the Dual Fuel Furnace installed and a small supply of coal on hand, no discomfort would have been had, for coal could have been used during temporary gas shortage and homes kept comfortable.

The opportunity is present for those companies not previously exploiting gas for central unit heating, coal prices high, deliveries poor, to investigate this new furnace further and engage in some trial installation during coming fall and winter and no good argument can be advanced by prospective user for with it householder can use gas or coal or both together as he pleases.

EFFICIENT GOGGLES.

A FEW years since, the offering of "goggles" for sale in the field of gas-mains, and need for them in the running of pipe-lines through country districts, was not known, nor were "goggles" called for, but today, in view of the fact that the type of light produced by oxy-acetylene welding is injurious to the naked eye of the welder, excellent "goggles" are made indispensable, and just the right kind are important.

It depends upon whether the "goggles" are made right, and whether the color of the "goggles" is right where one desires eye-saving, eye-rest, good-work, and lasting stability.

Don't let your operatives do welding without proper "goggles." You owe it to them, to your work and to yourselves, that the right kind shall be provided. Investigate, it's a good rule.

¶ **Get down to brass tacks with yourself! Sooner or later the problem of advertising, once a slim shadow will become a grim substance. "Putting it off" cuts no knots but, only draws them tighter.**

Make it thy business to know thyself, which is the most difficult lesson in the world.—Cervantes

RESULTS OF DRILLING—LATEST REPORTS

PENNSYLVANIA FIELD

ALLEGANY FIELD

Lee, Potter Gas	Dry
Place, McKean Natural Gas	Gas
Dry	1
Gas well	1

MIDDLE FIELD

Lot [illegible], National Utilities 17	Dry
Lot [illegible], National Utilities 18	Dry
Lot [illegible], T. D. Collins est. [illegible]	Dry
Johnson, Triumph Oil 19	Gas
Johnson, Triumph Oil 20	Gas
Schreiber, Continental Oil 1	Dry
Lot 352, Pennsylvania Oil 8	Gas
Reed, Wm. Roberts 11	Dry
Dry	[illegible]
Gas wells	[illegible]

VENANGO-CLARION

Andrews, S. P. Oil 1	Dry
Bech, U. S. Gas 1	Gas
Baum, Kahle & Co. 6	Gas
Dale heirs, Bleakley et al. 16	Dry
Dale heirs, Bleakley et al. 17	Dry
[illegible], David McCalmont [illegible]	Dry
Clarion County	
Mong, R. F. & J. W. Whitehill [illegible]	Dry
Black, F. D. Younkers 6	Dry
Jefferson County	
Haddenger, S. P. Oil 2	Dry
Dry	[illegible]
Gas wells	2

BUTLER-ARMSTRONG

Miller, Harting Foltz et al. 1	Dry
Thomas, Rall Bros. 1	Gas
Vensel, W. R. Rash 2	Dry
Stevenson, Henry & Co. 1	Gas
Reedm, Reedin O. & G. 4	Dry
[illegible], Rushville Oil 1	Dry
Dry	4
Gas wells	2

SOUTHWEST PENNSYLVANIA

Washington	
[illegible], Grayson Oil 1	Dry
Montgomery, N. G. Co. of W. Va. 1	Gas
Wright, N. G. Co. of W. Va.	Dry
Davis, Carnegie Gas 1	Gas
Evans, Peoples Gas 1	[illegible]
[illegible], Philadelphia Co. 1	Gas
Ft. Pitt Bridge Co., Ft. Pitt Bridge 1	Gas
Dorseyville—	
Greenwood Cemetery, Walley & Co. [illegible]	Dry
Hodil heirs, American N. G. 1	Gas
[illegible]ngoma	
[illegible], Brooks & Snyder 2	Gas
[illegible], Warrendale O. & G. 2	Gas
[illegible] City	
[illegible], S. P. Oil, M. D. 4	Dry
[illegible], Brown & Co. 2	Dry
[illegible], American N. G.	Dry
[illegible], Moore & Co. 2	Dry
Shrum, Coleslock & Co. 4	Dry
Payton, Wildwood Oil 1	Dry
McClintic Marshall, McClintic Marshall 3	Gas
Imperial	
Troutman, Peoples Gas 1	Dry
Allingham, Davis Petrie & Co. 1	Dry
Schmidt heirs, Schmidt Bros. 1	Gas
Beaver County	
Hernesser, S. P. Oil, M. D. 2	Dry
Miller heirs, Gales & Mellon 1	Dry
Milltown	
Douglass, Peoples Gas 2	Dry
Mt. Morris	
[illegible], I. I. Garrard & Co. 11	Dry
Bell, Peoples Gas 1	Gas
Strawn, Peoples Gas [illegible]	Gas
Nichols, Peoples Gas 1	Gas
Phillips, Peoples Gas [illegible]	Gas
Strong, Peoples Gas	Gas
Thomas, Philadelphia Co. [illegible]	Dry
Smith, N. G. Co. of W. Va. [illegible]	Gas
Keffer, Carnegie Gas 2	Gas
[illegible], Mfrs. L. & H. 3	Gas
Dry	[illegible]
Gas	17

WEST VIRGINIA

[illegible]	
[illegible] Mfrs. [illegible] & [illegible]	Gas
[illegible]	Dry
[illegible] & [illegible]	Dry
[illegible]	Gas
[illegible] Carnegie Gas	Gas
[illegible] W. Va. Central Gas [illegible]	Gas
[illegible] Carnegie Gas [illegible]	Gas
[illegible] Hope Gas [illegible]	Gas
[illegible] S. P. [illegible]	Gas
[illegible] S. P. [illegible]	Gas
[illegible] Hope Gas [illegible]	Gas
[illegible] S. P. [illegible]	Gas
[illegible] Philadelphia [illegible]	Gas
[illegible]	
[illegible] Carnegie Gas	Gas
[illegible] Carnegie Gas	Gas
[illegible] Mfrs. [illegible] & [illegible]	Gas
[illegible] Philadelphia [illegible]	Gas
[illegible] S. P. [illegible]	Gas
[illegible] Hope Gas	Gas
[illegible] Hope Gas [illegible]	Gas
[illegible] Carnegie Gas [illegible]	Gas
[illegible] Gas	Gas
[illegible] Mfrs. [illegible] & [illegible]	Gas
[illegible] Mfrs. [illegible] & [illegible]	Gas
[illegible]	
[illegible] Carnegie Gas	Gas
[illegible]	
[illegible]	Dry
[illegible]	
[illegible] S. P. [illegible]	[illegible]
[illegible] & [illegible]	[illegible]
[illegible]	[illegible]
[illegible]	
[illegible]	Dry
[illegible] & [illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

There are occasions when it is undoubtedly better to incur loss than to make gain.—Plautus

Wirt County—
Nutter-Wilson, Campbell Oil 2 ..... Dry
Rathbone Tract, Robert Bros. 109 ..... Dry
Gilmer County—
Woods, Hope Gas 1 ..... Gas
Fisher heirs, Hope Gas 1 ..... Gas
Cox, Carnegie Gas 1 ..... Dry
Broadwater, Philadelphia Co. 1 ..... Gas
Wilson, Philadelphia Co. 1 ..... Gas
Maxwell heirs, Philadelphia Co. 3 ..... Dry
Cottrill, Philadelphia Co. 1 ..... Gas
Campbell, Carter Oil 5 ..... Gas
Freeman, Eastern Petroleum 5 ..... Gas
Trainor heirs, Trainor Bros. 3 ..... Dry
Pleasants County —
McKnight, Logan Oil 4 ..... Dry
Powell, Octo Oil 14 ..... Dry
Carson, B. H. Gorrell & Co. 1 ..... Dry
Roane County—
Dalrymple, Latta O. & G. 1 ..... Dry
Shreengost, S. P. Oil 1 ..... Dry
Kanawha County—
Sunday Creek Coal, U. F. G. 19 ..... Dry
Sunday Creek Coal, U. F. G. 20 ..... Gas
Sunday Creek Coal, U. F. G. 21 ..... Gas
Ward heirs, Cabin Creek Gas 17 ..... Dry
Ward heirs, Cabin Creek Gas 18 ..... Gas
Goshorn, O'Connell & Co. 56 ..... Gas
Dry 21
Gas 36

SOUTHEASTERN OHIO.

Woodsfield—
Ktafy, Banner Oil 1 ..... Dry
Perry County—
Keyvham, Keller, Marshall & Co. 8 ..... Dry
Jones Bros., Jones Bros. 5 ..... Dry
N. F. P. Co., Haydenville Oil 20 ..... Dry
Muskingum—
Tweed, D. D. Flanigan & Co. 1 ..... Dry
Notestein, Clay O. & G. 19 ..... Dry
Cannon, Chicago Oil 3 ..... Dry
Estadt, J. O. McKee & Co. 1 ..... Dry
Schaffer, J. W. Keiffer 3 ..... Dry
Macksburg—
Miller-Blake, Macatee & Co. 1 ..... Dry
Williams, Monroe-Noble Oil 9 ..... Dry
Athens County—
Grovenor, G. W. Ashburn 4 ..... Dry
Morgan County—
Van Fossen, Penn O. & G. 46 ..... Dry
Dougherty, W. B. Dougherty 16 ..... Dry
Bowman, Kamerer & Co. 10 ..... Dry
Marietta—
Stephens, Fort Harmer Oil 54 ..... Dry
Keiffer, Carter Oil 2 ..... Dry
Nicholson, Cambria Oil 4 ..... Dry
Keiffer, Carter Oil 1 ..... Dry
Smith, Phelix Oil 1 ..... Dry
Hutcheson heirs, Wickersham & Co. 4 ..... Gas
Schoen, Burkhart & Co. 1 ..... Dry
Harris, Bailey Oil 1 ..... Gas
Wickens, J. T. Dillon & Co. 24 ..... Dry
Decker, J. B. Braden Oil 6 ..... Dry
Decker, W. A. Decker & Co. 8 ..... Dry
Carroll County—
Hoynacki, Scott O. & G. 3 ..... Gas
Harrison County—
Kinzey, Home Co. 1 ..... Dry
Jefferson County—
Burris, Lewis & Co. 1 ..... Dry
Linton, Thompson & Co. 1 ..... Dry
Columbiana County—
Smith, Geo. Vickers 5 ..... Dry
Belmont County—
Gibson, O. F. S. 1 ..... Dry
Caldwell, N. G. Co. of W. Va. 1 ..... Dry

Dry 30
Gas 3

PENNSYLVANIA FIELDS

SUMMARY OF OPERATIONS.

	Comp.	Prod.	Dry	Gas
Allegany	18	45	1	1
Bradford	42	139	0	0
Middle Field	46	52	5	3
Venango-Clarion	64	81	6	2
Butler-Armstrong	23	50	4	2
Southwest Penna.	62	191	17	17
West Virginia	132	1,365	21	35
Southeast Ohio	113	1,045	30	3
Total	500	2,968	84	63

CENTRAL OHIO.

LICKING COUNTY.

Granville—Jones, Columbus Nat. Gas 1 ..... Gas
Washington—E. M. Wartham, Utica Gas, Oil & Mining Co. 3 ..... Gas
Liberty—W. W. Green, Ohio Fuel Sup. 1 ..... Gas
McKean—I. Jones, Columbus Nat. Gas 1 ..... Dry

Dry 1
Gas 3

FAIRFIELD COUNTY.

Berne—J. Mossburger, City Nat. G. 1 ..... Gas

KNOX COUNTY.

Jefferson—A. S. Vance, Ohio Fuel Sup. 1 ..... Gas

ASHLAND COUNTY.

Green—Frank Kilvar, Logan G. & F. 1 ..... Dry
Hanover—Chas. Sackle, Ohio Fuel Sup. 1 ..... Gas
Mohican—A. Huston, Ohio Fuel Sup. 1 ..... Gas
Miflin—M. B. Landis, Ohio Fuel S. 1 ..... Dry

Dry 2
Gas 2

MEDINA COUNTY.

York—H. W. & E. Bowman, Logan Gas & Fuel 1 .... Dry
J. Gager, Ohio Fuel Supply 1 ..... Dry
Harrisville—A. Dague, Ohio Fuel Sup. 1 ..... Gas
Joel Holmes, Logan Gas & Fuel 1 ..... Gas
Litchfield—Holmes, Jos. H. Artman 1 ..... Dry
Westfield—N. E. & B. Cole, Medina Gas & Fuel 1 .. Gas
J. W. Troutman, Medina Gas & F. 1 ..... Gas
Brunswick—Fordham, Medina G. & F. 2 ..... Gas
Lafayette—Infirmary, Logan G. & F. 1 ..... Gas
Mary House, Medina Gas & Fuel 1 ..... Gas
Medina—Schaber, Ohio Fuel Sup. 1 ..... Gas
Liverpool—John Hansel, Ohio Fuel Sup. 2 ..... Gas

Dry 3
Gas 9

WAYNE COUNTY.

Congress—Rockenfelder, Logan G. & F. 1 ..... Dry
Chester—Morrow, Logan Gas & Fuel 1 ..... Dry
C. E. Martin, Ohio Fuel Supply 1 ..... Dry
Cannan—J. Gearhart, Ohio Fuel Sup. 6 ..... Gas
W. F. Funk, Logan Gas & Fuel 1 ..... Gas
C. H. Ault, Medina Gas & Fuel 2 ..... Gas

Wayne—Fetzer, Ohio Fuel Supply 1 Gas
Clinton—M F Eddy, Medina Gas & F 1 Gas

Dry 3
Gas 5

RICHLAND COUNTY

Monroe—M & J Shearer, Logan G & F 3 Dry
N Smith, Logan Gas & Fuel 1 Gas
A F Peterson, Logan Gas & Fuel 3 Gas
Sam Andrews, Ohio Fuel Sup 1 Gas

Dry 1
Gas 3

CUYAHOGA COUNTY

Middleburg—W D Gardner, F Ohio Gas 2 Gas
Strongsville—J P Richards, F Ohio G 1 Gas
Dover—M F Wolfe, Logan Gas & Fuel 1 Gas
H P & F Kimmel, Logan G & F 1 Gas
Pettach, Preston Oil 1 Gas
Chas Doran, East Ohio Gas 1 Gas
Alice M Munn, Preston Oil 1 Dry

Dry 1
Gas 6

VINTON COUNTY

Richland—T W McGriffin, Ohio F S 1 Dry
Ella Gibson, Ohio Fuel Supply 2 Gas
Ida M Ramsey, Ohio Fuel Sup 2 Gas
Leona Shoemaker, Ohio F S 1 Gas
Carl R Poling, Ohio Fuel Sup 4 Gas
Clyde S Stuck, Ohio Fuel Sup 1 Gas
C F Purves, Ohio Fuel Supply 1 Gas
John Scott, Ohio Fuel Supply 1 Gas
Ruth Davis, Ohio Fuel Supply 1 Gas
Erwin Kruger, Ohio Fuel Supply 1 Gas
Jackson—Reinhart, Ohio Fuel S 1 Dry
Mary F Winters, Ohio Fuel Supply 1 Gas
[illegible] M Lantz, Ohio Fuel Supply 1 Gas

Dry 2
Gas 11

JACKSON COUNTY

Jackson—D Jenkins, Ohio Fuel Sup 1 Dry

PERRY COUNTY

Thorn—Emma M Smith, Ohio F S 2 Gas
W A Boring, Ohio Fuel Sup 1 Gas
D N Carver, Logan Gas & Fuel 1 Dry
N A Lyon, Logan Gas & Fuel 1 Gas
Wm Culp, Hetsey Gas 1 Dry

Dry 2
Gas 4

HOCKING COUNTY

Salt Creek—Wm Tindal, Logan G & F 1 Gas
W H Wiggins, Ohio Fuel Supply 1 Gas
Wm Hardin, Ohio Fuel Supply 1 Gas

Gas 3

COSHOCTON COUNTY

Mill Creek—J H Storm, Medina G & F 1 Dry

CENTRAL OHIO FIELDS

SUMMARY OF COMPLETED WORK

	Comp	Prod	Dry	Gas
[illegible]	4			
Fairfield			1	
[illegible]				
Ashland	4			
Medina	19	8	1	3
Lorain	0	0	0	0
Wayne	8	0	3	6
Richland	4	0	1	3
Cuyahoga	2	0	1	1
Vinton	13	0	2	11
Jackson	1	0	1	0
Perry	5	0	2	3
Hocking	1	0	0	1
Holmes	0	0	0	0
Coshocton	2	21	1	0
Marion	0	0	0	0
Total	66	31	12	43

LIMA FIELD

AUGLAIZE COUNTY

Salem—A J Gearhart, Salem Oil 1 Dry
Washington—F Kohler, F A Bream 1 Dry

Dry 2

SENECA COUNTY

Clinton—Gordon Barkhoff & Co 1 Dry

INDIANA FIELD

JAY COUNTY

Penn—Lemuel Horn, W [illegible] Horn & Co 2 Dry
M W Jones, M W Jones & Co 1 Dry
[illegible] Harris, Murphy & Miller 1 Dry
N Thomas, F W Thom 1 Dry
Knox—Fisher, Jones & Hartley 1 Dry
Washington—Fisher, Simmons et al 1 Dry

Dry 6

GIBSON COUNTY

Washington—Shanklin, Indian Refining 1 Gas
Perry—Hillman, Indian Refining 1 Gas

Gas 2

PIKE COUNTY

Madison—Jas Smith, Murphy estate 1 Dry

SULLIVAN COUNTY

Gill—Prodgen, Indiana Illinois [illegible] 1 Dry

INDIANA FIELD

SUMMARY OF COMPLETED WORK

[illegible]			4	
Jay	2			
[illegible]			6	7
[illegible]				
[illegible]			2	
[illegible]	1	0	1	0
Total	3	0	13	7

Saving makes a man fit and able to do things.—Mark Hanna

KENTUCKY-TENNESSEE.

WAYNE COUNTY.

Cooper—Sam Shearer, M. Jones & Co. 1 ..... Dry

LAWRENCE COUNTY.

Ulysses—Austin, White Bros. & Huff 1 ..... Gas
Mattie Gause, White Bros. & Huff 1 ..... Gas

Gas 2

ESTILL COUNTY.

Irvine—Thos. Powell, Empire Oil & Gas 4 ..... Dry
Luther Young, Empire Oil & Gas 5 ..... Dry
Cvrus White, Empire Oil & Gas 1 ..... Dry
Billy Cox, Crown Oil 4 ..... Dry
A. J. Rawlins, Crown Oil 23 ..... Dry
Simp Horn, Security Prod. & Refg. 2 ..... Dry
Wade Parks, Clark & Co. 2 ..... Dry
Geo. M. Reed, Sr., Ohio Oil 5 ..... Dry
Matt Lowry, Stanton Oil 4 ..... Dry
Bratlin, White, Newton & Moore 13 ..... Dry

Dry 10

POWELL COUNTY.

Pilot—W. M. Adams, Federal Oil 12 ..... Dry
Howard Phillips, Bundy & Hare 1 ..... Dry
J. Townsend, Huff, Wirebaugh & Co. 1 ..... Dry
J. Townsend, D. N. Baker & Co. 1 ..... Dry
John Kinzer, Cumberland Pet. 2 ..... Dry

Dry 5

LEE COUNTY.

Beattyville—R. Kincaid, Kenova Oil 1 ..... Dry
Wiler, Rex Oil & Gas 1 ..... Dry
Arch Snowden, Snowden Oil 1 ..... Dry
Poplar Thickett, Hopewell Oil 1 ..... Gas
Johnson, Southwestern Oil 1 ..... Dry

Dry 4
Gas 1

BATH COUNTY.

Licking Union—Alley, Kentucky Prod. 1 ..... Dry

ALLEN COUNTY.

Scottsville—C. Stovall, Southern Oil 5 ..... Dry
W. H. Spann, E. T. Adams & Co. 1 ..... Dry
R. A. Read, Hogue & Boggs 1 ..... Dry
Vivian Brown, Eastern Oil 1 ..... Dry
W. P. Dalton, Anderson & Dulin 2 ..... Dry
Gregory, Kentucky-Indiana Oil 2 ..... Dry
W. J. Brown, Yoke Oil 2 ..... Dry
R. A. Read, Yoke Oil 2 ..... Dry
Dobbs, Anderson T. Herd 1 ..... Dry
Spurlock, Apex Oil 2 ..... Dry

Dry 10

KNOX COUNTY.

Barboursville—Brown, White & Co. 1 ..... Dry

PERRY COUNTY.

Buffalo—North Oil 1 ..... Dry

JOHNSON COUNTY.

Paintsville—Connolly, Bed Rock Oil 1 ..... Gas

WARREN COUNTY.

Enos Harris, H. W. Johnatzen Oil 1 ..... Dry

PULASKI COUNTY.

Somerset—Isaac, Curtis & McGavern 2 ..... Gas
Coyler, Senate Oil 1 ..... Dry

JACKSON COUNTY.

Drip Rock—Tom Rose, Hillis Bros. 1 ..... Dry

BREATHITT COUNTY.

Cope Branch—Buck Crawford, Atlantic Prod. & Refg. 1 ..... Dry

MADISON COUNTY.

Waco—C. L. Searcy, W. K. White & Co. 1 ..... Dry

TAYLOR COUNTY.

Campbellsville—Morrison Develop. 5, 6 ..... Gas
Buchannan, Morrison Development 1 ..... Gas
Penick, Morrison Development 1 ..... Gas

Gas 3

MONROE COUNTY.

Emberton—Unknown 1 ..... Dry

ADAIR COUNTY.

Columbia—Dunbar, Sunrise Oil 1 ..... Dry

KENTUCKY-TENNESSEE.

SUMMARY OF COMPLETED WORK.

	Nov. '17			Oct. '17		
	Comp.	Prod.	Dry	Comp.	Prod.	Dry
Wayne	4	29	1	7	20	2
Wolfe	3	55	0	6	14	4
Lawrence	5	19	2	5	15	1
Estill	34	195	10	69	683	8
Powell	49	1,330	5	43	1,372	4
Lee	18	155	5	4	235	1
Bath	1	0	1	0	0	0
Allen	16	70	10	14	255	3
Whitley	0	0	0	2	5	1
Lincoln	0	0	0	3	30	0
Metcalf	1	0	1	0	0	0
Knox	3	15	1	4	22	0
Perry	1	0	1	0	0	0
Johnson	1	0	1	0	0	0
Warren	5	50	1	0	0	0
Barren	0	0	0	2	10	1
Pulaski	2	0	2	1	10	0
Jackson	4	40	1	2	20	1
Boyle	0	0	0	1	0	1
LaRue	0	0	0	4	0	4
Breathitt	1	0	1	0	0	0
Madison	1	0	1	0	0	0
Taylor	4	0	4	4	0	4
Simpson	0	0	0	1	10	0
Hopkins	0	0	0	1	0	1
Monroe	1	0	1	0	0	0
Adair	2	3	1	0	0	0
Tennessee	0	0	0	1	0	1
Total	156	1,961	50	174	2,702	37

ILLINOIS FIELD.

CLARK COUNTY.

Parker—Mrs. A. R. Hays, Kewanee O. & G. 11 ..... Dry
Casey—King est., Geo. H. Stahr & Co. 11 ..... Dry
Chas. Bair, Ohio Oil 8 ..... Dry

Dry 3

CRAWFORD COUNTY.

Oblong—W. D. Walker, Mahutska Oil 14 ..... Dry
Prairie—M. Barlow, Fisher Oil 8 ..... Dry
G. W. Cox, Central Refining 1 ..... Dry
Honey Creek—J. P. Wagner No. 2, Ohio Oil 2 ..... Dry
G. W. Goff, Ohio Oil 16 ..... Dry

Dry 5

By the work one knows the workman.—De La Fontaine

WABASH COUNTY

ih	Clint Payne Dewes & Co 1	Dry
ermel	P Oleendorf Stolz & Co 1	Dry
		—
		2

ILLINOIS FIELD.

SUMMARY OF COMPLETED WORK

	Nov '17			Oct '17		
	Comp	Prod	Dry	Comp	Prod	Dry
	8	58	1	11	301	0
reland	0	0	0	2	6	0
ord	19	148	1	19	116	6
ace	10	271	0	8	148	0
n	0	0	0	1	0	1
ih	1	40	2	1	0	1
	0	1	0	1	1	0
nough	1	2	0	1	0	1
otal	41	669	10	48	672	9

MID CONTINENT

KANSAS

MONTGOMERY COUNTY

4	Shannon Geo Shannon 1	Gas
14	Duncan Crown Rock Oil 1	Dry
15	Bruce E N Durham 1	Dry
15	[illegible] Roth 6	Gas
16	Cleveland Crown Rock Oil	Dry
17	Roy Jesse Graham	Gas
18	Gilmer Appleton et al 1	Gas
18	Morris Rothrock Dubois & Dees	Dry
		—
19		4
20		4
		Gas

CHAUTAUQUA COUNTY

2	Wood Duck Oil 1	Gas
2	Dustin Pet Co 4	Dry
2	Allen H E Templeton 1	Gas
2	Haggard Dubois et al	Dry
2	Wm Wabnaugh et al Gas 1	Dry
2	Shaw W H Special	Dry
2	Dalton Pet Co 24	Dry
2	Burgeson Sachem Oil Co 1	Gas
2	Allen Welch Oil 1	Gas
11	Casement Dana Oil 1	Dry
2	Deer Sachem Oil 4	Gas
1	Kimball Nelson Oil	Dry
2	Deere Sachem Oil	Gas
2	Mrs Thompson Casement et al 6	Dry
1	Power Sachem Oil 1	Dry
2	Riffle 4	Dry
2	Nixon Dana Oil	Dry
2	Lee W B Lawrence 4	Gas
2	Lee W B Lawrence 8	Gas
2	Parlee E A Markham 24	Dry
2	Mayfield Osage Cherokee Oil 2	Dry
2	Lee Mary Holiday 1	Gas
		—
19		24
20		8
		Gas

BUTLER COUNTY

1	Burgess Mar Oil 1	Dry
1	Deer Lawrence & Parlee	Dry
1	Bates Pet Co 4	Dry
1	Marshall Oil & Gas Co 1	Dry
26	27	4	Shaw Empire Gas & Fuel 1	Dry
---	---	---	---	---
3	27	4	Wright Derby et al 6	Dry
10	28	4	Feltham Empire Gas & Fuel 20	Dry
8	29	4	Evans Mid Kansas Oil 2	Gas
4	28	5	Wilson Pet Co & Co 1	Dry
			Dry	8
			Gas	1

MIAMI FRANKLIN DOUGLAS COUNTIES

18	17	22	Light Hurley et al 1	Dry
13	17	22	Light Unknown persons 1	Dry
36	16	24	McCullough Lavelle et al 6	Dry
10	16	21	McCam Alpine Oil & Gas 2	Dry
6	17	21	Robbins Reed & Hayhurst 1	Gas
10	16	20	Kyle Jed Caldwell 2	Gas
18	16	21	Fullerton Thew Oil & Gas 4	Dry
32	17	21	Tullos Fleet Oil 1	Gas
21	17	22	Green I N Miller 1	Dry
21	17	22	Green I N Miller 2	Dry
14	16	22	Collins Kellerstrauss 1	Dry
12	16	21	Fisher Marvin Oil & Gas 1	Dry
10	16	21	McKam Alpine Oil & Gas 2	Dry
22	16	21	Hathcoff [illegible] Oil 1	Dry
6	16	21	Robbins Reed & Hayhurst 1	Gas
3	16	21	Rice Petro Oil & Gas 1	Dry
30	16	21	Mitchell Derby & Tyndale 1	Dry
22	16	21	Wisdom Gibson Dev 1	Dry
4	17	22	Spurgable McCullough & Travis 1*	Gas
16	17	22	Williams Racine Oil 1	Gas
16	17	22	Williams Racine Oil 2	Gas
16	17	22	Williams Racine Oil 3	Gas
14	17	22	McCashen Long Oil & Gas 1	Dry
14	17	22	McCashen Long Oil & Gas 4	Dry
14	17	22	Travis De Travis 1	Dry
14	17	22	Crain McCandless 1	Dry
14	17	22	Bevan McCandless et al	Dry
6	16	21	Wilson Underwood [illegible]	Dry
6	16	21	Rowland Wilson Underwood & Co 1	Dry
			Dry	31
			Gas	8
			Production	1,000,000

NEOSHO COUNTY

29	20	18	Taylor Wills et al 1	Dry
8	29	20	Wilson Anderson Oil 2	Gas
17	29	20	Bean & Mathes 1	Gas
			Dry	1
			Gas	2
			Production	3,000,000

ALLEN COUNTY

28	26	18	Henderson Bassett Gas & Oil 1	Dry

WILSON COUNTY

1	29	15	Osage Miller 1	Gas
28	29	15	Osage Miller	Dry
1	29	15	Martin Brown Oil & Gas 2	Dry
8	29	15	Ark Pet & Oil 2	Dry
11	29	15	W Stanley et al 1	Dry
			Dry	6
			Gas	1

WILDCATS

Chautauqua County

1	33	13	Osage Tarkington & Tarkington 1	Dry
1	33	13	Mason Bass & Long 1	Dry
1	33	13	Burgeson Sachem et al 1	Gas
1	33	13	Riffle Sachem Oil 1	Gas

Cherokee County

4	34	23	Wilson Smith Wade et al 1	Dry

Miami County

4	16	23	Reed Hay Reed 1	Dry
4	16	23	Robbins Reed & Co 1	Dry

Some people are so fond of ill-luck that they run half-way to meet it.—Jerrold

Butler County—
25-27-6, Schwartz, Iroquois Oil 1..... Dry

Dry 6
Gas 2
Production 200,000

OKLAHOMA.

WASHINGTON COUNTY.

9-26-13, Whiteturkey, National O. & D. 2..... Dry
33-29-14, Fee, E. V. Crowell 1..... Gas
11-27-13, Clay, National Oil & Dev. 26..... Dry
10-26-13, Harkins, Portrell et al 1..... Dry
19-28-14, Parks, Montgomery Oil 7..... Dry
9-28-15, Miller, Ed Karns 4..... Dry
19-26-13, Hilderbrand, Keystone Oil 1..... Dry
16-28-13, Hogshooter, Kawfield Oil 1..... Dry
7-27-17, Wilson, Midland Oil 7..... Dry

Dry 8
Gas 1
Production 1,000,000

OSAGE COUNTY.

5-21-11, Osage Nat Gas 1..... Gas
5-22-12, Lot 82, Charles Owens 1..... Gas
33-33-11, Finance Oil 17..... Gas
5-21-10, Carter Oil 5..... Gas
14-21-10, Osage & Okla Gas 1..... Gas
33-21-12, Carter Oil 1..... Gas
33-21-12, Monitor O. & G..... Dry
35-22-10, Tidal Oil 1..... Dry
4-22-11, Kansas Nat. Gas 3..... Gas
4-22-11, Kansas Nat. Gas 4..... Gas
9-22-11, Kansas Nat. Gas 3..... Gas
33-21-12, Southwestern & Carter 17..... Dry
31-25-10, nd. Ter Ill. Oil 187..... Gas
24-29-10, Mallory & Stewart 5..... Dry
1-22- 8, Harris O. & G. 1..... Gas
1-22- 8, Kiskadden Oil 1..... Dry
33-21-12, Monitor O. & G. 1..... Gas
19-27-11, Ind. Ter. Ill. Oil 259..... Gas
15-26-11, Lahoma O. & G. 1..... Dry
31-25-11, Lot 181, Ind. Ted. Ill. Oil 93..... Gas
9-22-11, Lot 316, Charles Owens 51..... Dry
5-21-10, Carter Oil 5..... Gas
15-29-10, Ind. Ter. Ill. Oil 193..... Gas
33-21-12, Monitor Oil 1..... Dry
1-22- 8, Block Oil 8..... Dry
33-23-11, Finance Oil 2..... Gas
22-27-10, Echo Oil 3..... Dry
9-23- 8, Sinclair Gulf & Osage Hominy 811..... Gas
15-29-10, Ind. Ter. Ill. Oil 197..... Gas

Dry 10
Gas 19
Production 60,000,000

CHEROKEE SHALLOW SANDS.

22-24-17, Jenkins, Milo Oil 1..... Dry
14-24-17, Bird, White Point Oil..... Dry
14-26-15, H. Janzen, Hale & Purdy 2..... Dry
8-25-16, McConnie, Big Four O. & G. 1..... Dry
4-26-16, Smith, Carter Oil 1..... Dry
26-24-16, Lovell, Milo Oil 8..... Dry
16-28-18, Green, Painter & Stoger 1..... Dry
4-25-17, Clark, Arapahoe Pet. 1..... Dry
15-24-17, Palmour, Amalgamated Pet. 6..... Dry

Dry 9

TULSA, BIXBY, GLENN POOL, WICEY, KELLYVILLE AND BRISTOW.

33-21-12, Lot 104, Monitor O. & G. 1..... Gas
34-18-11, Specogee, Dardanelle Oil 1..... Dry
33-18-12, Tucker, Okla. State Oil 1..... Dry
4-17-12, Laurel Oil & Gas 6..... Dry
5-19-14, Childers, Aiken Oil 1..... Gas
36-18-14, Moore, Edgar Oil 4..... Gas
24-18-14, Beaver, Keno Oil 4..... Dry
36-16-14, Anderson, Atlantic Pet. 3..... Dry
36-16-14, Anderson, Atlantic Pet. 5..... Dry
30-15- 9, Bartlett & Buell 10..... Gas
7-19-11, sland, Page e al ..... Gas
7-17-12, Pittman, Producers Oil 22..... Gas
10-18-13, Fee, Minshall O. & G. 1..... Dry
35-17-11, Martnell, unnamed persons 5..... Dry
5-17-12, Drew, Gypsy Oi 21..... Dry
27-21-13, Martin, Halsell 3..... Dry
4-17-12, Brown, Laurel O. & G. 10..... Dry
7-17-12, Pittman, Prod. Oil 24..... Dry
5-19-11, Bell Phoenix Refg. 2..... Gas
33-21-12, Lot 03 Carter Oil 1..... Gas
12-17-12, Slater Lake Pork Refg. 2..... Dry
22-18-12, Brown, Manaford O. & G. 8..... Dry
32-18-12, Churchill, C. G. Tibbens 6..... Dry
34-18-12, Martin, Producers Oil 22..... Dry
30-17-11, Northland Oil 1..... Dry
31-17-14, De Prieste, P. O. G. 1..... Dry
32-18-13, Mullen, McTon Oil 2..... Gas
26-18-14, Hickory, Misener et al 6..... Dry
13-18-11, Lee, Lee Oil 17..... Gas
6- 8-12, Bigpond, March Oil 19..... Gas
32-17-12, Stewart, T E. Turner 4..... Dry
13-19-13, Arcutt, Mid-States Oil 9..... Dry
21-17-13, Murray, Hubbard et al 4..... Dry
21-17-14, Steel, Atlantic Pet. 1..... Dry
10-16-13, Perryman, Wilcox Oil 4..... Dry
21-16-13, Bigpond, Atlantic Pet. 1..... Dry

Production 25,000,000
Dry 25
Gas 11

MUSKOGEE AND WAGONER.

23-18-16, Childers, Frank Wright 7..... Dry
28-14-15, Carter Cooper et al 1..... Dry
15-13-15, Ike Simons et al 1..... Dry
6-17-15, Apueka, Caney River Gas 1..... Gas
10-15-15, Simmons, Gladys Belle 1..... Dry
26-15-15, Franklin, Brown et al 1..... Gas
30-15-16, Howard, Boynton O. & G. 2..... Dry
12-14-14, Franklin, Togo Oil 3..... Dry
16-14-16, Manuel, A. D. Morton et al 3..... Dry
15-13-15, Sandy, Simons et al 1..... Dry
33-14-16, Bell, Aksarben Oil 2..... Dry
7-14-15, Rentie, Levine et al 1..... Dry
14-14-15, Shooham, Central Oil 1..... Dry
21-25-16, McIntosh, Billingslea et al 1..... Dry
21-16-15, Drew, Melba Oil 3..... Dry
34-15-15, Franklin, England Oil 2..... Dry
17-15-16, Harrison, Caney River Gas 1..... Gas
28-28-15, Tiger, Callopy et al 8..... Dry
33-28-15, Bird, Ardizzone et al 7..... Dry
22-18-16, Williams, Oarnell et al 1..... Dry
28-18-16, Fulotka, F. V. Wright 1..... Dry
14-14-17, Buffington, Pittman et al 1..... Gas
8-15-15, Ware, Caney River Gas 2..... Dry
6-15-15, Manue, Carter Oil 3..... Gas
8-15-15, Barnett, Caney River Gas 2..... Dry
31-15-15, Mayson, Okla. Oil Wells 4..... Dry
36-15-15, Peters, W. B. Pine 2..... Dry
2-14-15, Manuel Kiskadden & Oiler 2..... Dry
26-18-16, Fulotka, Pennypacker et al. 4..... Dry
26-18-16, Fulotka, Pennypacker et al. 3..... Dry
23-18-16, Childers, Frank Wright 8..... Dry
19-19-15, Bellsted, Savoy Oil 1..... Dry
29-20-15, Cuddles, R. Pettitt 1 ..... Dry
26-15-15, Franklin Brown et al. 1..... Dry
35-15-15, Canada, Cosden O. & G. 1..... Dry

Do not turn back when you are just at the goal.—Syrus

15	14	Peters Pine et al 1 — Dry
15	14	Franklin Togo Oil 1 — Dry
15	14	Sands J D Simmonds 1 — Dry
15	15	Banks Brady et al 1 — Dry
15	15	Bell Aberdeen O & G 1 — Dry
15	14	McCollum Christian et al 2 — Dry

Dry 37
Gas 4
Production 15,000,000

BALD HILL AND BOOCH SANDS

15	13	Doyle C I Bryan et al 1 — Dry
15	14	McIntosh Producers Oil 4 — Dry
15	14	McIntosh W Phillips 1, 2 — Dry
15	14	Wright Van Houten & Hewitt 6 — Dry
15	14	Adams J W Moore 4 — Dry
15	14	Grayson Sperry O & G 4 — Dry
15	14	Cobras Campbell & Stout 6 — Dry
15	14	Grayson Gilmer Oil 2 — Dry
15	14	Miller Margay Oil 2 — Dry
15	14	Manuel Fred Pendler 1 — Dry
15	14	Nelson Selby O & G 2 — Dry
15	14	Starr Magnolia Pet 16 — Dry
15	14	Drew Braniger et al 10 — Dry
15	14	West Okmulgee P & R 4 — Dry
15	14	Stevens Magnolia Pet 12 — Dry

Dry 14

OKMULGEE MORRIS

16	11	Tamaroawah Sinclair O & G 4 — Dry
15	11	Bryan Dickerson et al 1 — Dry
15	14	Hutton Kingwood Oil — Gas
15	14	Pat J H Reinold et al — Gas
16	13	Stevens Grant et al 1 — Dry
15	11	Steph Kimbley et al 1 — Gas
15	11	Farmer Carter Oil 1 — Dry
15	14	Roberts Schenck et al 1 — Dry
15	14	Butler W I Newton 1 — Dry
15	14	Horn Kaiser Spelter 1 — Gas
15	14	Newby Kimbley & [illegible] — Gas
15	14	Sampson Logan [illegible] et al — Dry
15	13	Easley Barbara [illegible] — Gas
16	11	Tate Grimes et al 2 — Dry
16	11	Paleom Jackson et al 2 — Dry
15	13	Randall Mitchell [illegible] — Dry

Dry [illegible]
Gas 7

VALE QUAY AND PAYNE COUNTIES

15	4	Hemmie Sinclair O & G 1 — Gas
18	4	Elite Roma Oil 1 — Gas

Gas 2
Production [illegible]

CLEVELAND PAWNEE MANNIFORD AND OLIVE

21	8	Williams Lee Davis 2 — Dry

CUSHING AND SHAMROCK

17	7	Ward Petr A 1 — Dry
17	8	Sun Siberian Oil 20 — Gas
18	7	Pendleton Oil 2 — Dry

Dry 4
Gas 1
Production [illegible]

BLACKWELL NEWKIRK AND PONCA CITY

26	1	[illegible] — Dry
26	1	Prairie Empire O & G — Gas
26	1	[illegible] — Dry
26	1	[illegible] — Dry

Production [illegible]
Dry 1
Gas [illegible]

GARFIELD AND NOBLE COUNTIES

25	1	Barbyte R A Barbour 1 — Dry
21	1	Cam Amber Oil 1 — Dry
23	23	Forrest Medco Petroleum — Gas
21	4	Harrington Rush Creek [illegible] — Dry

Production [illegible]
Dry 1
Gas 1

HEALDTON DISTRICT

31	1	Westheimer Urbana Oil 9 — Dry
30	1	Adams et al 1 — Dry
31	1	Westheimer Watchorn et al 1 — Dry
1	1	Wornbo Producers Oil 4 — Dry
30	1	Cesarma Oil 1 — Dry
13	1	Humble Roumania Oil 1 — Dry
30	1	Johnson Sinclair & Natral — Gas
30	1	W Daney J J Hamon [illegible] — Dry
31	1	W Urbana Oil 2 — Dry
30	1	Daney J J Hamon Oil [illegible] — Dry
32	1	Buchman Buchman Oil 1 — Dry

Production [illegible]
Dry 10
Gas 1

WILDCATS

Kay County

27	1W	Galbreath Chate et al [illegible] — Dry
28	1W	Myers Duluth Ohio Oil 1 — Dry

Garfield County

30	21	Granite Oil & Gas 1 — Dry

Creek County

19	12	McIntosh [illegible] — Dry

Kay County

[illegible]		Dry
[illegible]		Dry

Pawnee County

21	1	[illegible] — Gas

Osage County

26	1	[illegible] — Gas

Johnston County

26	15	Mars Hamon Pet — Dry

Stephens County

1	1	[illegible] — Dry
2	1	[illegible] — Dry

Garvin County

28	3W	[illegible] — Dry

Comanche County

4	12	[illegible] — Dry

Caddo County

11	9	[illegible] — Gas

Pottawatomie County

12	12	[illegible] — Gas

Cherokee County

20	21	[illegible] — Gas

Pontotoc County

3	4	[illegible] — Gas
3	4	[illegible] — Gas
4	4	[illegible] — Gas
5	4	[illegible] — Gas
5	4	[illegible] — Gas
5	4	[illegible] — Gas
5	4	[illegible] — Gas

Stephens County

2	5	[illegible] — Gas

Garvin County

28	3W	[illegible] — Gas

To conduct great matters and never commit a fault is above the force of human nature.—Plutarch

Pontotoc County—
1- 4- 6, Oliver, Benedum & Trees 1 ..... Dry

Dry 25
Gas 3
Production 30,000,000

ARKANSAS.

Jefferson County—
13- 6- 8, Jefferson Oil 1 ..... Dry
Montgomery County—
9- 7-24, Harold, Arkoma O. & G. 1 ..... Dry
Howard County—
36- 9-27, Perpetual Oil & Gas 1 ..... Dry
Benton County—
5-19-31, Summers, Centerton Oil 1 ..... Dry
Sebastian County—
18- 7-32, Universal Oil & Gas 1 ..... Dry
11- 4-32, R. T. Lane et al. 1 ..... Dry

Dry 6

KANSAS.

SUMMARY OF WELLS COMPLETED.

	Comp.	Prod.	Dry	Gas
Montgomery	43	275	4	4
Chautauqua	48	626	14	8
Butler	128	25,567	9	1
Allen	27	187	0	0
Miami-Franklin-Douglas	85	847	21	7
Wilson	16	60	4	1
Neosho	28	444	1	2
Wildcats	22	342	8	2
Total	397	28,348	61	25

OKLAHOMA.

SUMMARY OF WELLS COMPLETED.

	Comp.	Prod.	Dry	Gas
Cherokee d. s.	68	1,336	7	1
Cherokee s. s.	96	810	9	0
Osage	86	7,175	11	18
Creek Nation	319	10,103	85	24
Kay County	15	2,660	2	1
Garfield-Noble	15	1,910	3	1
Cushing-Shamrock	17	810	1	1
Cleveland	25	1,193	1	0
Healdton	62	3,583	10	1
Wildcats	41	640	27	3
Total	744	30,220	156	50

MID-CONTINENT.

SUMMARY OF WELLS COMPLETED.

	Comp.	Prod.	Dry	Gas
Oklahoma	744	30,095	156	50
Kansas	397	28,348	61	25
Arkansas	6	0	6	0
Total	1,147	58,443	223	75

TEXAS PANHANDLE.

WICHITA AND WILBARGER COUNTIES.

Electra—
Kemple, Stough et al. 1 ..... Dry
Smith, Federal Oil 3 ..... Dry
Marsh, Texas-Colorado Oil 1 ..... Dry
N. Ziset, Theobald Oil 1 ..... Dry
White, Magnolia Petroleum 1 ..... Dry
Ancell, Peoples Oil 1 ..... Dry

Dry 6

CULBERSTON DISTRICT.

Burnett, Mutual Oil 1 ..... Dry
Burnett, Thos. Gresham et al. 1 ..... Dry
Hurdleson-Burnett, Gulf Production 2 ..... Dry
Waggoner Bros., Producers Oil 2 ..... Dry
Forbes-Burnett, Gulf Production 3 ..... Dry
Waggoner Bros., Chapman & McFarlin 2 ..... Dry
Burnett (Section 5), Langford, Staley & Chenault 1 ..... Dry
Burnett, Magnolia Petroleum 2 ..... Dry

Dry 8

BURKBURNETT.

Ruyle, Ruyle Farm Oil 15 ..... Dry
Dodson, L. R. Crowell 3 ..... Dry
Danels, F. H. Hunter 1 ..... Dry
G. C. Woods, Magnolia Petroleum 3 ..... Dry
Clark, Texahoma Oil & Gas 3 ..... Dry
Powell, Texahoma Oil & Gas 19 ..... Dry
Daniels, Hall & Fares 1 ..... Dry
Horton, Lattimer et al. 1 ..... Dry
Beach, Knight & Smith 15 ..... Dry
Rexford, Gt. Northern Refining 5 ..... Dry

Dry Holes 10

PETROLIA.

Byers, Producers Oil 36 ..... Dry

WILDCATS.

Archer County—
Grant, Barton Valley Oil 1 ..... Dry
Wilson, 66 Oil 2 ..... Dry
Munger, Clover Leaf Oil 1 ..... Dry
Nutt, Lee Farm Oil 1 ..... Dry
Overby, Lee Farm Oil 1 ..... Dry
Reunion, Reunion Oil 1 ..... Dry
Orton, Coline Oil 1 ..... Dry
Parrish, St. Clair Oil 1 ..... Dry
Skiles, Midway Oil 1 ..... Dry
Stephens County—
Hughes, Texas & Pacific Coal 1 ..... Dry
Eastland County—
Walker, Texas & Pacific Coal 1 ..... Gas
Wichita County—
Sunday, Sunday Oil 1 ..... Dry
Brown County—
Low, Hillman et al. 1 ..... Dry

Dry holes 12
Gas 1

NORTH LOUISIANA.

Caddo—
16-21-15, School Tee, Producers Oil 1 ..... Dry
De Soto—
25-13-12, Grand Bayou Pl'ting, Prod. O. 17 ..... Dry
Miscellaneous—
2-11-16, Bland, Producers Oil 1 ..... Dry
8-10-14, Sallings, Atlas Oil 1 ..... Dry
22-19- 4, McLain, Southern Carbon 1 ..... Gas

Dry 4
Gas 1

Honest labour bears a lovely face.—Dekker

NORTH LOUISIANA.

SUMMARY OF OPERATIONS

	Comp	Prod	Dry	Gas	Rigs	Drg	T I
	[illegible]	[illegible]	1	0	43	[illegible]	[illegible]
ndo	1	0	1	0	1	8	9
Lover	1	3[illegible]	0	0	2	3	[illegible]
w	1	1[illegible]	0	0	2	3	[illegible]
Runaway	1	0	2	1	6	42	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ll	11	2,61[illegible]	4	1	54	111	164

GULF COAST.

GOOSE CREEK

rd, Crown Oil & Refining 1 Gas

MISCELLANEOUS

Fairway Counties
mana Southern Gas 2 Gas

GULF COAST

SUMMARY OF OPERATIONS

ject	Comp	Prod	Dry	Rigs	Drg	T I
a	0	0	0	1	[illegible]	[illegible]
La Rose	0	0	0	1	2	3
ay	4	1[illegible]	2	2	[illegible]	[illegible]
Caves	21	2,[illegible]	8	1[illegible]	[illegible]	[illegible]
ke	17	6,[illegible]	1	2[illegible]	[illegible]	[illegible]
ngs	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
hom	0	0	2	[illegible]	4	[illegible]
ke Charles	2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ngs	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lake	2	[illegible]	0	0	[illegible]	[illegible]
n	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
n Mound	4	[illegible]	1	[illegible]	[illegible]	[illegible]
n Pintas	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Iberia	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
llaneous	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
als	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

JTOMATIC TEMPERATURE CONTROL.

BY H. F. GILBERT

ITHIN the memory of the youngest gas men in the country there has been encompassed the entire development of two very important factors in the heat treating of metals at high rratures

st High pressure single pipe systems of com tion

ond Automatic temperature control for use in ction with gas fired high temperature furnaces

one familiar with either subject will most heartily se the statement to the effect that the first fac ssible taking a long step in the direction of mast efficiency in the development of heat treatment tals at high temperatures is incomplete without second factor and that where the two are com bined there are attained results that with either one alone are impossible

By methods and devices developed and perfected within the last few years, it is now possible to accomplish automatic-temperature control at any maximum temperature that it is possible to reach with gas fuel and still avoid any form of deterioration of the control system, or its parts, and without any form of maintenance still insure continued and satisfactory operation of the device during any number of years

It is likewise possible, by simple and convenient means, to accomplish the definite setting of temperatures within the range of the furnace and to accomplish automatically any desired flame condition or state of heat compression within the furnace, thereby avoiding in many instances the necessity of a muffle that heretofore has been the essential in many processes

The above statements are possible of convincing proof, in many plants throughout the country In those cases where definite tests have been conducted, as in the plant of the Otis Elevator Co at Harrison, N J, and in the plants of J H Mathews & Co and Pittsburgh Steel Stamp Co at Pittsburgh, the following essential facts have been developed, they are presented as convincing proof

First, that it is possible by means of this method, to automatically control the temperature of a furnace during any continued period, however long, within three-quarters of one per cent as verified by state ment of Otis Elevator Co covering the subject, wherein they set forth this fact as resulting from the test they have conducted

Second that the capacity of a furnace can be very largely increased as per the statement of Pittsburgh Steel Stamp Co They conducted a test for the purpose of establishing what was considered a fact, namely that they are able to obtain about double the production from a furnace that they obtained before they installed this equipment

Third, that results are uniformly perfect in all parts of the heating chambers and that this is equally true with the door open or closed This appears in statements made by the Pittsburgh Steel Stamp Co who in test conducted found this to be an absolute fact and finally that after two years of service without maintenance or replacement of parts the device will now as before register its original calibration This appears in statements of concerns that have had the equipment installed during this length of time

The subject is of more than passing interest because of its relation to the necessary high standard now established in the heat treatment of metals and the fact that skilled labor is becoming more and more difficult to secure or retain

It would with automatic control seem possible based on the results accomplished to eliminate very largely the speculation present in the heat treatment of metals at high temperature I do not consider it unreasonable to suggest that hand controlled gas fired high temperature furnaces will be supplanted by furnaces automatically controlled as a natural consequence of the better results that follow

Knowledge and timber shouldn't be much used till they are seasoned —Holmes

CONVERTING LINOTYPE METAL MELTING FURNACE FROM COAL TO GAS.

A VERY useful suggestion as to means whereby a linotype metal melting furnace may be converted from coal to gas, has recently developed at Colorado Springs.

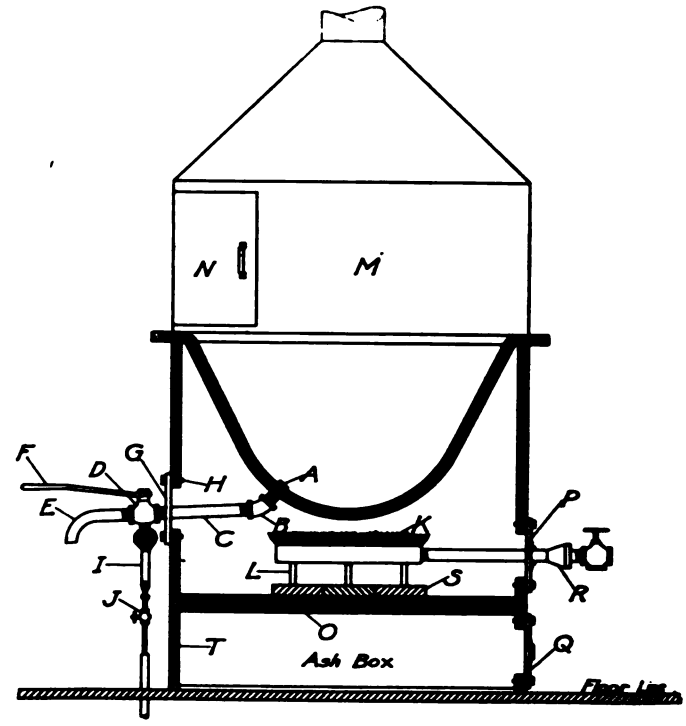
Good practical industrial work is being done along gas-lines in the city of Colorado Springs, by the Colorado Springs Light, Heat & Power Company at the hands of George H. Sullivan, Industrial Salesman, who supplies the following information, and a most excellent illustration of the method employed, through the "U. G. & E. Bulletin." Mr. Sullivan says:

"The line-drawing shows the furnace as converted to gas, and particular attention is called to Spout (E) which adds greatly to the convenience of operation of the furnace and makes it possible to draw off the metal with the least possible waste.

"In applying Spout (E) the vertical line on which it was desired to have the spout project from the jacket was first located on the outside, then the metal pot was tilted up on that side and held up by pieces of board between the rim and jacket. The point for inserting the close nipple (A) in the pot was located in line with the vertical line on the jacket and the pot drilled and tapped for 1-inch iron pipe and a close nipple (A) and 45 degrees elbow (B) screwed in. (All the pipe and fittings used should be ordinary extra heavy 1-inch iron pipe, no brass fittings.) The pot was lowered and a hole considerably larger than the pipe was cut in the jacket (T) where the pipe nipple (C) would pass through. Then a pipe nipple (C) was screwed into the elbow (B), the nipple being long enough to extend about two inches outside of the jacket. An iron plate (G) ½ inch thick, with a hole in the center just large enough for the pipe nipple to pass through, was bolted to the outside of the jacket to cover the opening and support the pipe nipple and prevent strain on the close nipple screwed into the pot. A flat-head iron service cock (D) was screwed into the nipple and a piece of iron pipe bent to form the spout (E), which was screwed into the service cock (D). A handle (F) for the service cock about 15 inches long was made from 1¼ x ½ inch soft iron bent and slotted to fit over the head of the service cock and pinned in place.

"A ⅛ inch gas line was run under the service cock and a small bunsen burner (I) placed under the service cock to heat it and make it easy to turn. The bunsen burner has a separate valve (b) underneath, and it is only necessary to light the burner a few minutes before starting to run metal.

In describing the conversion of this furnace Mr. Sullivan says, "I found this furnace back of the printing shop in a shed, as they could not have the smoke and dirt in the shop. On days when it was needed one of the employes had to be out there all day, his time costing $4 per day. He also had to carry the metal out to the shed and carry it back to the shop which was about 200 feet. After four months of talking I finally converted the furnace and moved it into the shop. We tapped the bottom of the kettle (as described previously) so the metal could be run into moulds instead of pouring it by a ladle, which is very dangerous and wasteful. The same work is accomplished in an hour and a half which formerly took a whole day.



A—Close nipper.
B—45° elbow.
C—Iron pipe nipple.
D—Flat Head all iron service cock.
E—Spout made from bent pipe.
F—Soft iron handle on valve.
G—Iron plate bolted to pot jacket, hole in center for pipe.
H—Bolts for iron plate.
I—Bunsen burner to heat service cock so it will turn freely.
J—Valve for bunsen burner.
K—3 Ring burner placed under pot in coal fire box to heat metal.
L—Supports placed under burner to raise up to within 3" of pot.
M—Ventilating hood.
N—Sliding door in hood.
O—Grates under fire box.
P—Fire box doors.
Q—Ash box doors.
R—Burner mixer.
S—Fire brick.
T—Metal pot jacket.

DEANE AUTOMATIC PUMPS AND RECEIVERS.

The Worthington Pump & Machinery Corporation has issued Bulletin D-1301 illustrating and describing Deane Automatic Pumps and Receivers. These are built for steam and electricity and may be had in single, duplex and triplex models.

This apparatus comprises a receiver or tank into which is drained the discharge from piping or machinery, a pump (steam or electric) which draws the water from the receiver and pumps it back into the boiler under pressure, the necessary automatic devices for regulating these operations and the necessary water and steam or electric connections.

Good health and good sense are two of life's greatest blessings.—Syrus

NO GASOLINE SHORTAGE

The Following Has the Ring of Genuineness as It Is in Accord with the Views of the Petroleum War Service Committee

I

CARBON INDUSTRY OPPOSED.

State Senator of Louisiana, Leon R. Smith, Champions the Cause of Special Conservation.

IN Louisiana the manufacture of carbon black has grown into an industry of developing magnitude, and Senator Smith of Louisiana, like the street crossing traffic officer, holds up the hand to check that which he looks upon as foreshadowing the exhausting of Louisiana's supply of natural gas through the manufacture of carbon black. In making a recent statement, the Senator said:

"I intend to make a study of the other States that have dealt with this vital topic, and I will father any legislation that will protect the life of our natural gas supply."

The Senator claims that those who are of the carbon industry are unknown to him, and his offering a warning, and his services to accomplish conservation of gas are based wholly on his desire to serve his people. The Senator goes into the matter at some length, the following being a statement of his own words, touching upon this matter of importance to his constituents:

> In New York City we read that in all apartment houses the furnaces are shut down between the hours of 10 a. m. and 3 p. m. each day, to the great discomfort of the millions of people who have to shiver through these hours.
>
> This condition obtains throughout the land. Here close at home we read in public prints that Mayor Behrman had to make a hurried trip to Washington to plead for coal enough to take care of the essential needs of the city of New Orleans. Mayor Behrman succeeded in his mission, and the service he rendered New Orleans was considered great indeed.
>
> The Texas & Pacific Railway Co. only recently obtained permission from the Louisiana passenger trains to save coal so that war material moving over the rails of that company would not have to be retarded.
>
> The President, acting under the war powers granted him, has placed all the railroads of the United States under a director general and has named as that official one of the biggest men the Wilson administration has produced, viz., W. G. McAdoo, Secretary of the Treasury. The fuel situation was a large factor in bringing about this decision.
>
> Now, with all of these facts being brought home to us, we have been profoundly grateful for our supply of natural gas. Notwithstanding the world shortage of fuel, this section of the State has felt snug in the fact that we had what we all have thought was an inexhaustible supply of natural gas.
>
> Naturally, it would be presumed that the people of Louisiana were doing all in their power to safeguard this God-given natural resource, but such is not the fact.
>
> An industry has recently sprung up in Louisiana that threatens the life or longevity of our natural gas supply—in fact, it is my opinion that if the people are not aroused, in four or five years natural gas will be a thing of the past in this State.
>
> In other words, we are permitting a great natural resource to be frittered away, and we are not only permitting a crime against ourselves, but we are deliberately permitting posterity to be robbed of what is rightfully its due.
>
> I use emphatic language, for I think the situation warrants vigorous treatment. The abuse I refer to is the use that is being made of natural gas to manufacture carbon. Carbon is a by-product of natural gas.
>
> I should not have dignified the making of carbon as a manufacturing enterprise. As I understand the process, natural gas is allowed to flow practically unrestrained after being ignited, and only a corrugated iron shed is placed over the burning gas. A roof of carbon deposit is the result of this wasteful procedure.
>
> The landowner gets a paltry return for the sale of the great natural resource that he consents to being frittered away. A landowner gave me the following figures of how insignificant was the return, or royalty, to the landowner of the natural gas he sold to the carbon maker.
>
> One well for a stated period of less than 30 days produced 24,349,500 feet of gas, for which the landowner received as royalty 2 cents per 1,000, or $47.70. Another well yielded 7,312,800 feet, for which he received a royalty check of $14.62. A third well produced 14,903,800 feet and a remittance of $29.80 was the landowner's royalty.
>
> I am reliably informed that the consumption of Shreveport averages 7,000,000 feet of gas a day, so it appears that this city could have been supplied for three and one-half days with the natural gas from which the above landowner received the magnificent sum of $48.70.
>
> Monroe has only recently enjoyed the blessings of natural gas, and the use of natural gas for carbon in that section is a thriving industry, thereby threatening seriously the supply of that city.
>
> The Terrebonne Parish gas field promises New Orleans the boon of natural gas at some future date. In fact, the United States Government has canvassed the situation with a view of aiding the early entry of natural gas into the city of New Orleans. The carbon industry is looking with longing eyes to the use of this supply of gas, if the piping of the same to New Orleans meets with difficulties that apparently cannot be readily overcome.
>
> The entire State is vitally interested in the conservation of natural gas, as it is one of the great resources of the State.
>
> The Conservation Commission of Louisiana is awake to the threatened danger, but the power of that body under the present law to take action is doubtful.
>
> The State Council of Defense might take the matter up with the Federal Government and prompt relief might be had. I intend to make a study of the laws of the other States that have dealt with this vital topic, and I will father any legislation that will protect the life of our natural gas supply.
>
> The original suit that was filed against the owners of the wild well that was permitted to flow for over four years in the Caddo field I prepared and procured the Attorney General's consent at that time to file. The cause of action was upheld after a legal battle, and before a trial was had on the merits the well was closed.
>
> Later, in an address before the Ad Club of this city, I called attention to the criminal waste of gas from another gas well that was permitted to run wild, and with the aggressive campaign undertaken by the Ad Club the community was aroused, the State Conservation Committee went actively to work, and with the splendid co-operation of the large oil companies, this menace was removed.

Nothing great was ever achieved without enthusiasm.—Emerson

AROUND THE BELT

New Wells, New Pipe Lines, New Contracts, Additions and Extensions. A Field of Valuable News Gathered for the Journal Through Many Sources

TRADE PERSONALS

It will be noted that the names appearing under the personal headings are exclusively those of men interested in the development of the natural gas field. Those wishing to learn of matters pertaining to men interested in the field of artificial gas should refer to THE GAS INDUSTRY magazine published at the Pearl Street, Buffalo, N. Y., which devotes its columns entirely to artificial gas matters. That magazine is published by the publishers of THE NATURAL GAS JOURNAL, each magazine being most favorably named for its respective field. In this way each magazine reaches 100% efficiency in the industry it covers. **Publisher's Note**

Armstrong Lincoln Manager of the Oklahoma Gas & Electric Company, Enid division was captain of one of the Red Cross teams in the Holiday Red Cross drive which has been one of the most successful campaigns of the kind ever conducted in Enid

Cowan W. J. President of the Brink Oil & Gas Company, Henrietta Okla. has devised a new method for recovering gasoline from casing head gas and has laid the details of his process before the proper authorities at Washington

Drury A. L., of Independence Kan. is President of the reorganized Garnett Light & Fuel Company, Garnett Kan.

Evans, Lieut. H., former Manager of the Medina Gas & Fuel Company at Mansfield, Ohio, has received a commission as captain at the officers' training school at Fort Benjamin Harrison

Fenner, H. V., of Pittsburgh, Pa., a specialist in the field of gasoline from natural gas, has recently visited the gas and oil fields of Oklahoma

Hamilton, I. F., for many years Advertising Manager of the National Tube Company, Pittsburgh, Pa., is now affiliated with the Walworth Manufacturing Company, Boston, Mass.

Hannay, Colonel H., of the Bolshevik organization who has been Brigadier General in charge of the 165th Depot Brigade at Camp Cody, Deming, N. M., for the last several months, has been transferred to Camp Jackson, Columbia, S. C., in command of the 164th Depot Brigade

Hanna, H. H., manager New Business Department of the Oklahoma Gas & Electric Company, Oklahoma City, Okla., is Scout Master of the largest Boy Scout troop in the State of Oklahoma, which he was instrumental in starting

Hess, W. F., has been elected President of the Provo Oil & Gas Company, recently organized in Provo, Utah

Hogan, W. B., Manager of the Oklahoma Gas & Electric Company at Drumright, Okla., has been elected President of the Drumright Rotary Club

Hornbrook, Robert, has resigned as Commercial Manager of the Louisville Gas & Electric Company, Louisville, Ky., in order to enter government service as First Lieutenant of Infantry at Camp Zachary Taylor

Penn, M. C., has been appointed General Manager of the Dixie Gas Company, Birmingham, Ala. This company recently took over the Aldrich home property of the Gulf Producing Company, Birmingham

Schaeffer, W. I., formerly Assistant Advertising Manager of the National Tube Company, Pittsburgh, Pa., is now Advertising Manager of the company, succeeding I. F. Hamilton

Sexton, Sam W., for many years Foreman for the United Natural Gas Company, Sharon, Pa., with the beginning of the new year retired from active service

Thompson, W. R., formerly Captain of the 104th Regiment of Engineers, stationed at Camp Cody, Deming, N. M., has been made Major in the same regiment. In civil life Major Thompson was Manager of Engineering and Construction for H. M. Byllesby & Company, and won recognition for valuable work in construction and engineering performed at and near Camp Cody

Wagner, C. M., has been elected Vice President of the Garnett Light & Fuel Company, Garnett, Kan., which recently changed hands

Watson, W. S., for the past 4 years connected with [illegible] Department of the Louisville Gas & Electric Company, Louisville, Ky., has succeeded Robert Hornbrook as Commercial Manager

ITEMS OF FINANCE

KANSAS—Wichita

The Derby Oil & Gas Company has declared a [illegible] per cent dividend payable to stockholders of record December 31st.

KENTUCKY—Frankfort

The Frankfort Kentucky Natural Gas Company has declared a dividend of [illegible] per cent payable February [illegible] to stock of record December [illegible]

Lexington

A [illegible] per cent dividend has been declared by the Central Kentucky Natural Gas Company, payable January [illegible] to stock of record December [illegible]

NEW YORK—New York City

The New York Stock Exchange [illegible] the Empire Gas & Fuel Company, a subsidiary of the [illegible] Oil Company, to the list. The Empire Company has been [illegible] to raise funds for [illegible] gas properties in the Southwest. Some of the [illegible] interested in the Empire Company are also [illegible] the Texas Company. A [illegible] dividend has been declared [illegible]

Progress is the law of life; man is not Man as yet.—Browning

are dated December 1, 1917, and are due December 1, 1919. Interest is payable semi-annually on June 1 and December 1.

OHIO—Cleveland

The East Ohio Gas Company is redeeming at 105 and interest the issue of $15,906,000 5 per cent bonds due July 1, 1939. The bonds were offered at 98 and interest in 1910. The total issue was in the amount of $18,906,000, of which $3,000,000 have previously been retired by the sinking fund.

NEW FRANCHISES

SOUTH DAKOTA—Hot Springs

The Alum Creek Petroleum Company is seeking a natural gas franchise in this city.

WYOMING—Cowley

The Cowley Gas Company has been granted a franchise here, and is already piping the city.

INCORPORATED

INDIANA—Indianapolis

A new concern formed in this city is the James O. Hamilton Oil & Gas Company, capital $50,000. James O. Hamilton and associates are the incorporators.

KANSAS—Garnett

The Garnett Light & Fuel Company has been taken over by new interests, and a reorganization has been effected. The new officers are: A. L. Derby, Independence, Kan., president; C. M. Weekly, Wichita, vice-president; C. W. Tyndale, treasurer, and Gail Carey, of Garnett, secretary.

OKLAHOMA—Okmulgee

The Peoples Electric & Gas Company has been incorporated with a capital stock of $75,000. Those named as incorporators are: A. B. DeFreeze, G. F Ortman and Earlan Reed, all of Okmulgee.

PENNSYLVANIA—Bradford

The Lewis Run Gasoline Company has been incorporated here with a capital stock of $400,000. The incorporators are: A. R. Johnson, H. D. Yates and A. J. Wise, all of Bradford.

TEXAS—Houston

The United Oil & Fuel Company was recently formed here with a capital stock of $100,000. Those who are named as connected with the new project are Walter J. Crawford and E. D. Lee, both of Houston; Sam George of Sour Lake, and H. G. Curran, of New York. Producing properties in the Jennings, Sour Lake, and Humble pools have been taken over by the new company.

UTAH—Corinne

The Corinne Oil & Gas Company has been formed here with a capital of $200,000. W. F. House of Corinne is President, and Charles F. Lloyd, Jackson, Mont., Secretary.

PER CUBIC FOOT—RATES

ARKANSAS—Fort Smith

An advance of 10 cents per thousand in its rates is announced by the Fort Smith Light & Traction Company.

INDIANA—Anderson

The Central Indiana Gas Company is supplying artificial gas in this city, Muncie, and Marion during the severe weather, to supplement its natural gas resources. For the manufactured gas the company is charging 90 cents per thousand for the first thousand cubic feet. A lower rate is provided for greater quantities.

KENTUCKY—Louisville

The franchise of the Louisville Gas & Electric Company provides that a pressure of not less than three ounces to the inch of natural gas be maintained. When the pressure falls below this figure the company has bound itself to make good the deficiency to its customers.

NEW YORK—Addison

The Addison Gas Company has filed a petition asking for permission to increase its rate from 40 to 50 cents per thousand.

Bolivar

The Empire Gas & Fuel Company has announced that beginning with February 1st its rate will be advanced to 40 cents per thousand. The present rate is 38 cents per thousand for domestic purposes.

Corning

The Crystal City Gas Company, which supplies local consumers with natural gas, announces an increase from 40 cents a thousand feet to 50 cents.

OHIO—Bowling Green

The Northwestern Ohio Natural Gas Company has adopted a ready-to-serve charge of 35 cents.

Toledo

The Northwestern Ohio Natural Gas Company has increased its rate from 35 cents net to 42 cents net per thousand. Permission to boost the rate was given the gas company by the State Utilities Commission. In addition to the 42-cent rate, the new schedule calls for a 30-cent rate on low pressure line between Perrysburg and Bowling Green. This rate formerly was 25 cents for 1,000 feet.

OKLAHOMA—Oklahoma City

The Consumers' Gas Company is asking for permission to increase its gas rates.

PENNSYLVANIA—Jefferson County

The Revere Natural Gas Company has increased its rate from 27 cents to 32 cents per thousand.

It is a wise man who so guards his affairs that he leaves little to chance.—James Bryce

WEST VIRGINIA—Charleston

The Hope Natural Gas Company is asking permission to increase its rates

GENERAL

ARKANSAS Little Rock

The Arkansas Natural Gas Company has contracted for [illegible] cubic feet per day additional supply of gas with a Louisiana concern

CALIFORNIA—Kern County

Naval Reserve No. 2 is located in the West Side fields of Kern County. This reserve includes 15,000 acres granted to the Southern Pacific Railroad as land grants. Most production will be lost if this land is to remain undeveloped as it will if set aside for the use of the Naval Reserve

Kern County

A distributing pipe line is to be constructed in this county by the Producers Gas & Fuel Company an issue of 12,000 shares of stock having been authorized for the purpose of financing the project

DISTRICT OF COLUMBIA—Washington

The order issued from the office of the Fuel Administrator in connection with the use of the United Fuel Gas Company operating in West Virginia gas fields and supplying companies in Louisville, Lexington and Frankfort Ky. wants the city of Washington supplied first for domestic purposes

ILLINOIS—Moline

The Moline City Oil & Gas Company has organized in this city for the purpose of developing gas properties and will commence drilling operations at once. The company has taken offices in the Peoples Bank Building of this city

Robinson

The Wabash Gas Company is building an artificial gas plant to take the place of the natural gas system which has not adequate

INDIANA—Anderson

The Central Indiana Gas Company has completed the engineering of its artificial gas plant and is now supplying artificial gas to augment its natural gas resources

Cambridge

Authority is asked by the Cambridge Natural Gas Company to issue $60,000 preferred stock the proceeds to be used for improvements

Liberty

Selma Davis C. W. Pigman A. Short and William Beckwith all Liberty business men have secured and now own the properties of the Liberty Gas Light & Fuel Company

Winchester

A gas well drilled twenty five years ago on the Davis farm three miles southwest of Winchester and abandoned for some unknown reason a few years ago has come back to life. The farm is owned by a Richmond [illegible] company. While attempting to loosen the iron cap Henry Davis owner of the farm narrowly escaped serious injuries when the gas pressure burst it into an [illegible] geyser more than one hundred feet high. Several hundred acres of land are included in the territory where the well is located and it is believed that a new flow of gas has been discovered

KANSAS—Elk County

The Rose Oil & Refining Co. No. 1 on the J. A. Morgan farm in the northwest of [illegible] is a [illegible] cubic foot gas well

Kansas City

According to report the mayor favors a plan advanced by the Gas Consumers League to operate a municipal artificial gas plant during the winter conserving the natural gas supply for the summer, for which period it is adequate

Kansas City

The Empire Gas & Fuel Company through its office in this city has adopted a very effective method of telling its consumers through the daily press of developments in the natural gas situation. A series of advertisements were prepared under the direction of R. J. Morrison who distributed them to sixty newspapers. The advertisements have been appearing in practically all of the daily newspapers in the towns in which the Kansas Natural Gas Company, the Western Natural Gas Company, the Southwestern Gas Company, the Empire Pipe Line Company do business although these advertisements the Empire Gas & Fuel Company has contracts for a million and a half people

Oswego

The Nelson et al well [illegible] northwest of here, in the Bartlett pool is [illegible] producing wells are reported to have been completed. The average gas production from these wells is estimated at between [illegible] cubic feet per day

Reno County

[illegible] in this county by the Hutchinson Gas Company. The drilling will be continued to a depth of [illegible] feet. Agreements [illegible] have been leased by the company.

KENTUCKY—Green County

[illegible] an artificial gas plant as auxiliary to the natural gas [illegible]

There are some defeats more triumphant than victories.—Montaigne

Louisville

The Charles C. Stoll Oil Co. has purchased a lease on 50 acres of producing land from the Furnace Oil Co. in the Irvine (Ky.) field, for $220,000.

The franchise assessment of the Louisville Gas & Electric Company has been increased from $6,000,000 to $13,000,000. The company's greatly increased business is responsible for this increase.

Three employes of the Louisville Gas & Electric Company have received commissions as a result of their training at the Second Officers' Reserve Camp —Robert Montgomery and Fulton Mandeville, First Lieutenants, and Walter L. Dawkins, Second Lieutenant.

LOUISIANA—New Orleans

The supply of gas from the Terrebonne district, it is said, is sufficient to take care of the needs of New Orleans. The Fuel Administration is advocating the speedy piping of the city, and the laying of a pipe line from the gas field to bring the gas into the city as a measure of coal conservation. Development work in this territory is receiving every encouragement.

NEW YORK—Batavia

It is reported that manufacturers of Batavia have expressed themselves in favor of abandoning the use of natural gas next winter in order that householders may have it all.

The Alden-Batavia Natural Gas Company is paying taxes on special franchise valuation of $240,700.

Dunkirk

The South Shore Natural Gas Company suffered severe loss recently through a fire in its meter plant.

Elmira

The Elmira Water, Light & Railway Company has contracted with the Potter Gas Corporation for a supply of 1,500,000 cubic feet of natural gas daily during the winter.

Madison County

W. E. Lewis of Utica is drilling on a farm three miles east of Cazenovia. Gas was found at a depth of 1,650 feet, but drilling is being continued to a lower level.

Pavilion

The Pavilion Natural Gas Company recently completed a good gasser on the farm of Patrick Quinlan one mile south of Pavilion. The Company is now drilling on the Patrick Doran farm, two miles west of here.

OHIO—Belmont County

In Meade district, E. J. Gallagher & Co.'s test on the T. J. McKelvey farm is a gasser in the Berea grit.

Bowling Green

A third gas well has been completed on the Normal college farm at a depth of 1,150 feet.

Cincinnati

The Union Gas & Electric Company has completed its artificial gas plant which is to be commissioned in periods of natural gas shortage. The plant will have a capacity of 15,000,000 cubic feet per day.

Lancaster

The Logan Natural Gas Company of Columbus has succeeded in increasing its supply of gas so that all consumers are taken care of, domestic as well as industrial.

Lima

It is reported that in the recent past the Medina Gas Company has drilled in six natural gas wells.

Mount Vernon

A court decision handed down in the local common pleas court would indicate that the use of pumps or compressors to increase the flow of natural gas in pipe lines is permissible.

Muskingum County

One mile west of Production in Cass Township George Guthrie & Co. have completed a test on the Thomas Little farm. It is a fair gasser.

Pleasants County

In Lafayette district, West Virginia, the Monongahela Oil Company has drilled a test on the Thornton Wagner farm through the Maxon sand. It is a gasser in that formation.

OKLAHOMA—Ada

The American Oil & Refining Company has completed a large gasser on the Bauhaus farm in section 17-4-6. The gas was uncovered at a depth of 1,300 feet. The capacity of the well is estimated at 28,600,000 cubic feet.

Bartlesville

It is reported that the Tahlequah Gas Company is now supplying gas in this city.

Bartlesville

With the completion of the new eight-story Masonic Temple now under construction in this city, the Quapaw Gas Company will establish itself in very handsome quarters, comprising six floors of the new building.

Cushing

Natural gas is now being distributed here by the Yale Natural Gas Company.

Enid

The Southwestern Refining Company at Enid, Okla., is rapidly completing its plant and will start operations February 1. The Oil State Refining Company has begun construction of its new plant and expects to start operations April 1. Both of these refineries use natural gas fuel under contract from the Oklahoma Gas & Electric Company, Enid division. The first named refinery has a capacity of 1,500 barrels and the latter 2,500 barrels daily.

Haskell District

In the Haskell district, the Caney River Gas Co. completed a 3,500,000-foot gas well in No. 2 on the Harrison farm, in the northwest of the southeast quarter of Section 17-15-16. The well was drilled to 1,207 feet.

Healdton Field

An eight-unit casinghead gasoline plant is being built by the Superior Petroleum & Gasoline Company

Chiefly the mould of a man's fortune is in his own hands.—Bacon

on the Wirt Franklin farm Section S 4 1 The lease on which the plant is to be operated is the property of the Roxana Petroleum Company The Superior Petroleum & Gasoline Company has the gas rights to all of the Roxana leases as well as to other properties in the field

Jefferson County

The County Fuel Administrator is urging haste on the part of companies selling natural gas for fuel purposes in installing their pipe lines into communities of this county where industries are located which can use gas for fuel

Okmulgee

The Sperry Oil Co completed a two-million-foot gas well on the McMahon purchase in Section 21 14 14

The Hanson Oil Co has a one-million-foot gasser in No 2 on the Veldes farm in Section 12 14 14

Osage

A one-million-foot gasser is reported by H V Foster on his No 10 in the southwest of the southwest quarter of Section 28 26 9

Pittsburgh County

At Featherstone this county the Cardinal Oil Company brought in a 10-million-foot well recently

Stephens County

According to report the Comanche gas field located in the north of Stephens County is rapidly decreasing in production Companies drawing their supply of gas from this field are looking for leases to seek other sources

PENNSYLVANIA—Allegheny County

In the Coraopolis district the Bradsham Development Company has completed a test on the Bradsham farm It is a gasser in the Gordon sand

Clarington

The Jefferson County Gas Company has recently acquired for $25,000 the properties of the Baden Gas Company and the Shuler Lumber & Company gas plant

Rhoadsh

The business of the Rock Run Fuel Company has been placed in the hands of a receiver

Erie

According to report the Pennsylvania Gas Company is extending its service in this city

Jefferson County

A gasser said to be producing 4 million feet has been brought in on the farm of A L and M S Southward The flow was found at a depth of 2,750 feet

Johnsonburg

The Consumers Gas Company has secured the control of the Midland Gas Company's supply of 3 million cubic feet of gas daily A connecting line of five miles to the main line of the Consumers Gas Company is under construction

Old City

The United Natural Gas Company during the gas shortage issued a general order to all of its offices in this and other states to the effect that a maximum pressure must be maintained in the plants and the service given over entire system Classes which include churches and schools

TEXAS Fort Worth

A stretch of seven miles of pipe line is being relayed by the Lone Star Gas Company

Waco

Artificial gas of 650 B T U will be manufactured here by the local natural gas company to augment its supply of natural gas which is proving inadequate to the demands made on it during severe weather

WEST VIRGINIA—Calhoun County

On Annamessah Creek Sheridan district Martin Crawley gave his second test on the Hall and Vice Mitchell farm a 4 1/2 on the Big Injun sand It is a fair gasser estimated at 1 000 000 cubic feet a day and also is good for 50 barrels of oil

Coalburg

The United Fuel Gas Company recently acquired the properties of the Kanawha Coal & Gas Company by purchase

Harrison County

On Indian Run Eagle district the same company has a gasser on the Big Injun sand at a test on the E V Robinson farm

Jackson County

On Sycamore Run Ravenswood district the United Fuel Gas Company has completed a test on the Sarah Van Winkle farm as a gasser in the salt sand

Kanawha County

On Pocatalico River Union district No 18 has come in as a gasser in the salt sand It is a gasser of 3 000 000 cubic feet a day

Lewis County

On Stone Coal Creek the Equitable Gas Company has completed a test on the Nutter farm It is a gasser in the Big Injun sand On the same district the same company has a test on the Hall Davis farm as a gasser in the same sand

Marion County

On Whiteday Creek Mannington district the South Penn Oil Company has brought in No 4 on the I F Watson farm as a gasser in the Big Injun sand It is a gasser of 3 000 000

Marshall County

On Fish Creek Meade district eight and three-quarters miles from Moundsville the Natural Gas Company of West Virginia has completed a test on the Big Injun sand The Natural Gas Company of West Virginia has also completed a test on the Sarah Van Winkle farm as a gasser in the salt sand

Monongalia County

On Muddy Creek district the Natural Gas Company has completed a test on the Jones farm as a gasser in the salt sand

Liberty exists in proportion to wholesome restraint —Webster

Parkersburg

The Hope Natural Gas Company is looking first after the needs of its domestic consumers, cutting off industrial users during periods of shortage.

Ritchie County

On Beesons Run, Clay district, the Carnegie Natural Gas Company's test on the Mary J. Sims farm is a light gasser in the Big Injun sand.

Roane County

On Cotton Tree Run, Walton district, the United Fuel Gas Company has a Big Injun sand gasser at its test on the W. D. C. Steele farm.

On Rock Creek, Walton district, the Carter Oil Company drilled its No. 4 on the C. E. Marks farm from the salt sand to the Big Injun formation. This well was formerly a gasser in the salt sand and is now showing for a light pumper in the lower sand.

Tyler County

In McElry district, the Pittsburgh & West Virginia Gas Company's test on the Jacob McCullough farm is a gasser in the Big Injun sand.

In the Centerville district, the Manufacturers' Light and Heat Company's test on the S. J. Straight farm is a light gasser in the Gordon sand.

Weston

Drilling of gas wells was stopped by many large development companies in Lewis County gas fields, in order to conserve the gas used under boilers for use in dwellings and factories.

The Keener Natural Gas Company recently took over the natural gas franchise of the Weston Gas Company as well as that company's distributing system. The wells owned by the Weston Company were not included in the deal.

Wetzel County

The Carnegie Natural Gas Company has completed No. 2 on the Patrick Noon farm, located on Long Drain Run, Church district. It is a gasser in the Gordon sand.

On Fish Creek, in Grant district, the Hope Natural Gas Company drilled a test on the A. J. Wichterman farm into the Gordon sand and developed a fair gas pressure.

On the north fork of Hughes River, Clay district, the Philadelphia Company's test on the B. H. Hickman farm is a gasser in the Maxon sand.

On Fish Creek, Church district, the Manufacturers' Light and Heat Company has a Gordon sand gasser at its test on the S. E. Stewart farm. One mile east of Pine Grove, Grant district, the Hope Natural Gas Company has completed in the Gordon sand its second test on the A. J. Wichterman. It is a fair gasser. In the same district the same company has drilled a test on the C. L. Newman farm through the Gordon and developed a light gas pressure.

In Grant district, the Philadelphia Company has drilled a test on the T. M. Haskins farm through the Fourth sand. It is a gasser in that formation. In the same locality the Manufacturers' Light and Heat Company's second test on the William Thomas farm is a gasser in the same formation.

Wirt County

On West Fork River, Coal district, the Clarksburg Light and Heat Company has a gasser in the 50-foot sand on the S. D. Gore Farm. The Reserve Gas Company's test on the Edwin Curry farm is a gasser in the Fifth sand.

WYOMING—Casper

According to report, the New York Oil Company and the Curtis Petroleum Company, drilling in combination at Iron Creek in the Wyoming territory have a gas well down 750 feet, four feet into the oil sand that will go over three million feet of gas a day. The drill is going down still further. The gas is wet and carries a heavy percentage of gasoline. It is intended to drill the well to 1,600 feet.

Cowley

A plant comprising sixty buildings has been completed by the Midland Carbon Company to house its carbon black manufacturing equipment. The plant has now reached two-thirds of its proposed size. When the entire plant has been completed and is in commission it will require a supply of 25,000,000 cubic feet of gas. The gas is piped from the Byron fields. A gasoline plant is being built by the Occidental Oil & Gas Company who will recover gasoline from the gas before it reaches the plant of the Midland Company, where the dry gas will be used for the making of carbon black.

ALBERTA—Calgary

The Calgary Petroleum Products Co. has made an offer to the city of Calgary to pipe gas from its wells at Okotoks to the city limits at a price of 12½ cents per 1,000 cubic feet, guaranteeing at least 1,000,000 cubic feet a day. The company controls two wells in the Calgary field, with an estimated production of 4,000,000 cubic feet per day of wet gas. A plant is now being constructed for the extraction of the gasoline, and the proposal is for the sale of the gas residue to the city. The Canadian Western Natural Gas, Light, Heat & Power Co. holds a franchise for Calgary, supplying gas from the Bow Island field; but a recent decision of the appellate division of the Supreme Court holds that the city has the right to distribute gas in districts annexed to Calgary since this company was granted its franchise. Under the proposal of the Calgary Petroleum Products Co. the gas from the Dingman wells would be piped to Calgary by the company and distributed by the city in the annexed areas.

Gain not base gains; base gains are the same as losses.—Hesiod

STANDARD OIL SUBSIDIARIES

BY JO. P. CAPPEAU SONS

Year of 1917

		Open	High	Low	Last
[illegible]	Anglo American	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Atlantic Ref	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Borne Scrymser	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Buckeye Pipe	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Chesebrough	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Colonial	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Continental	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Crescent	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Cumberland	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Eureka	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Galena Com	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Galena Pref	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Illinois Pipe	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Indiana Pipe	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	National Transit	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	New York Transit	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Northern Pipe	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Ohio Oil	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Prairie Oil	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Prairie Pipe Line	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Solar Refining	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Southern Pipe	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]	[illegible]	
[illegible]	South Penn Oil	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	South West Penn Pipe	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]	[illegible]	
[illegible]	S O of California	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	S O of Indiana	[illegible]	[illegible]		[illegible]
[illegible]	S O of Kansas	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]	[illegible]	
[illegible]	S O of Kentucky	[illegible]	[illegible]		[illegible]
[illegible]	S O of Nebraska	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	S O of New Jersey	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	S O of New York	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	S O of Ohio	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Swan & Finch	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Union Tank	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Vacuum Oil	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Washington Oil	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Penn Mex	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	International Petroleum	[illegible]	[illegible]	[illegible]	[illegible]

INDEPENDENT OIL COMPANIES

[illegible]	Elk Basin	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Pierce Oil	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Midwest Refining	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Tropical Oil	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Cosden Refining	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Sapulpa Refining	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Northwest Oil	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Northwest Oil Pfd	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Okla Producing & Refining	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Atlantic Petroleum	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Merritt Oil	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Midwest	[illegible]	[illegible]	[illegible]	[illegible]

FINANCIAL REPORT

BY JO. P. CAPPEAU SONS

Year of 1917

Stocks	Sales	Open	High	Low	Last	Bid	Ask
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mfg L & H	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]

42

NEW INGERSOLL-RAND BULLETINS.

The Ingersoll-Rand Company has recently issued the following Bulletins descriptive of their Pumps and Drills:

Form 859—Four-page leaflet on I-R Pocket Oil Flask.

Form 858—Steam Condensing Plant leaflet.

Form 3118—Thirty-two-page catalog on Compressors and Vacuum Pumps for extraction of gasoline from natural gas.

Form 4302—Twenty-page catalog on Sergeant Rock Drills.

Copies may be had upon making request of the Company's nearest branch office.

When Efficiency is the Watch-word

RESULTS COUNT!

DOES 5% GAIN IN EFFICIENCY APPEAL TO YOU

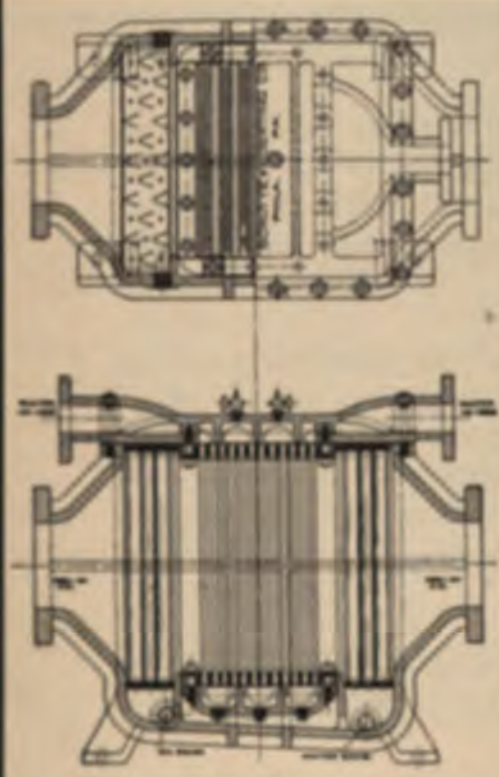

Fig. 1253

In the process of recovering Gasoline from Natural Gas by the compression system, efficient cooling units are an essential feature.

By installing **S. & K. After-Coolers** on the Gas Compressors and cooling the compressed gas by means of Boiler Feed Water circulated thru the tubes of the Cooler, an actual gain of

5%

in efficiency of your boilers can be secured.

The **S. & K.** cooling units as illustrated are the most efficient and compact units it is possible to secure.

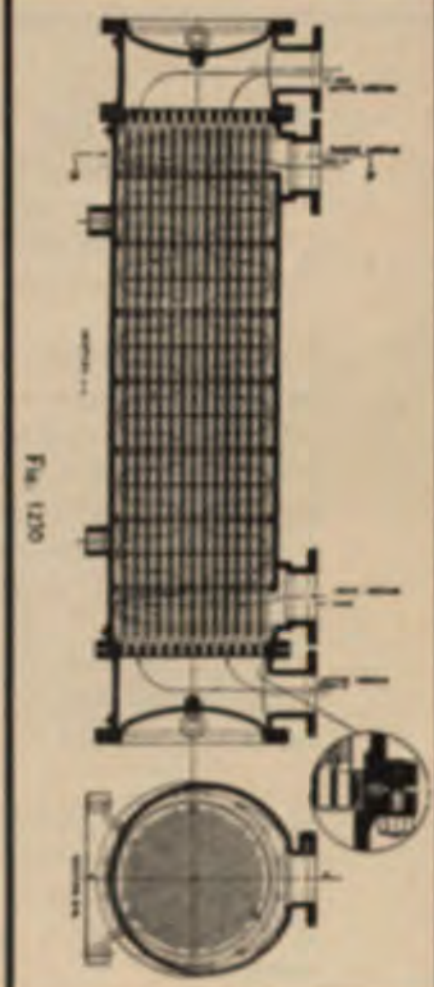

Fig. 1255

Heat Exchangers and Distillers

for use in Gasoline Absorption Systems are furnished by the

S. & K. CO. as shown ←

and are unsurpassed for low water requirements, weight, compactness and final results.

Send for Catalog No. 12 Illustrating the S & K Heat Transmission Apparatus

SCHUTTE & KOERTING CO.

Thompson & 12th Street, PHILADELPHIA, PA.

NEW YORK – 50 Church St.
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PITTSBURGH – Oliver Building
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Everything For Oil and Gas Wells

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"OILWELL" EST'D. 1862 C O TRADE MARK. REGISTERED.

THE DEEPEST WELL IN THE WORLD

Well No. 4100 being drilled by the Hope Natural Gas Co. on the Mary Gaff farm near Clarksburg, W. Va. On Jan. 29, 1918, the depth was 7,393 feet.

"OILWELL" EQUIPMENT IS IN USE ON THIS WELL

"We MAKE the machinery
That DRILLS the wells
That PRODUCE the oil
That the WORLD needs
For motive POWER"

OIL WELL SUPPLY CO.

PITTSBURGH

NEW YORK SAN FRANCISCO LOS ANGELES TAMPICO LONDON

Natural Gas and Gasoline JOURNAL

SUBSCRIPTION—
$2.00 IN THE U. S.

CONTENTS FOR FEBRUARY, 1918

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THIS NUMBER 2

PUBLISHER'S NOTICE

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HARRIS S. BIGELOW, *Secretary.*

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CONTENTS OF THIS ISSUE

INDEX OF PAST 1918 ISSUES

MEMBERS OF ASSOCIATION OF NATURAL GAS SUPPLY MEN

DAVID O. HOLBROOK, President, [illegible] Building, Pittsburgh

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Columbus Gas Stove Co., Huntington, W. Va.
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Columbus Htg. & Vent. Co., Columbus
[illegible] St. Louis
[illegible] Mt. Vernon, O.
[illegible] New York City
Cutler Hammer Mfg. Co., The, Milwaukee

[illegible] Jersey City
[illegible]
[illegible] Burner & Welding Co., Pittsburgh
[illegible] Engineering Co., Dayton, O.
[illegible] Apparatus Co., Pittsburgh
[illegible] Mfg. Co., Bradford, Pa.

[illegible]
[illegible]

[illegible] Pa.
[illegible] Mass.
[illegible]
[illegible] Pittsburgh
[illegible]

[illegible] Palmyra, N. Y.
[illegible]
[illegible] Cleveland
[illegible]
[illegible] Providence
[illegible]
[illegible]
[illegible]
[illegible] Akron, O.
[illegible]
[illegible]
[illegible] Gas Burner & Eng. Co., Pittsburgh

[illegible] Pittsburgh
[illegible] Muncie, Ind.
[illegible] Mfg. Co., Erie
Hart Mfg. Co., Cleveland
[illegible] Mfg. Co., Chicago
[illegible] & Co., Inc., Butler, Pa.
Hewitt Rubber Co., Pittsburgh
[illegible] Hamilton, O.
Hope Engineering & Supply Co., Pittsburgh

Ideal Heating Co., The, [illegible]
Imperial Belting Co., Chicago, Ill.
Ingersoll-Rand Co., Pittsburgh
International Hale [illegible] Providence
[illegible] Natural Gas Co., Buffalo, N. Y.

[illegible] Mfg. Co., Erie
[illegible] Water Heater Co., St. Louis
Jones & Laughlin Steel Co., Pittsburg, Pa.

[illegible] Iron Works, Steubenville, O.
[illegible] Stevens [illegible] Ohio
[illegible] A. & Sons Rope Co., St. Louis
[illegible] Automatic Steam Reg. Co., Cleveland
[illegible] Mfg. Corp., Pittsburgh

Ludlow Valve Mfg. Co., Pittsburgh

Macomber & Whyte Rope Co., Chicago
Manhattan Rubber Mfg. Co., Passaic, N. J.
Mark Mfg. Co., Chicago
Maxon Premix Burner Co., Muncie, Ind.
[illegible] Mfg. Co., [illegible] Mass.
[illegible] Metal Works, Erie
Minneapolis Heat Reg. Co., Minneapolis
[illegible] Iron Wks., Quincy, Ill.
[illegible] Safety Iron Co., Philadelphia
[illegible] Mfg. Co., The, Chicago
[illegible] & Co. Inc., Pittsburgh
[illegible] Mfg. Co., Kane, Pa.
Mueller H. Mfg. Co., Decatur, Ill.

Nathan Mfg. Co., New York City
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Natural Gas & Gasoline Journal, Buffalo
New Bedford Cordage Co., New York City
New York Belting & Packing Co., New York
[illegible] A. T. & Son Co., Marietta, O.

[illegible] Gas Journal, Tulsa, Okla.
[illegible] Oil City, Pa.
Oil Trade Journal, New York
[illegible] Pittsburgh
[illegible] Chicago

Parkersburg Mach. Co., Parkersburg, W. Va.
Parkersburg Rig & Reel Co., Parkersburg, W. Va.
[illegible] Heater Co., Pittsburgh
[illegible] Furnace & Stove Co., Warren, Pa.
Pittsburg Meter Co., East Pittsburg
[illegible] Brazing & Mach. Co., Pittsburgh
[illegible] Valve & Fittings Co., Pittsburgh
[illegible] Pittsburgh
[illegible] Pittsburgh
[illegible] Mass.
[illegible] New York [illegible]
[illegible] Morgantown, W. Va.

[illegible] Toledo
[illegible] Pa.
[illegible] Cleveland
[illegible] Youngstown, O.
[illegible] Mass.
[illegible] Pa.
[illegible] Mfg. Co., [illegible] Pa.
[illegible] Pa.
[illegible] Packer & Mach. Co., [illegible]
[illegible] N. J.
[illegible] Newark, N. J.
[illegible] Mfg. Co., Pittsburgh

[illegible] Pa.
[illegible] Mfg. Co., Pittsburgh
[illegible] Cleveland [illegible]
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[illegible] Pa.
[illegible] Pittsburgh
[illegible] Conn.
[illegible] Philadelphia
[illegible] Springfield, O.

[illegible] Pittsburgh
[illegible] Buffalo
[illegible] Toledo
[illegible] Pittsburgh

[illegible]
[illegible] N. Y.

[illegible] N. Y.
[illegible] Pittsburgh
[illegible] Mfg. Co., Pittsburgh
[illegible] Wheeling
[illegible] Pa.
[illegible] Pump & Mach. Co., Buffalo
[illegible] Mass.

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ANNUAL CONVENTION NATURAL GAS ASSOCIATION OF AMERICA AND ANNUAL EXHIBIT OF ASSOCIATION OF NATURAL GAS SUPPLY MEN—MAY 21 AND 22 AT PITTSBURGH, PA.

OVER HERE!

SAY you red-blooded fellow Over Here, take down the receiver and listen to a line of talk that ought to get under the hide and into the heart of men of your brand.

You are a skilled man. You have been fighting life's game in a country where every man has an even chance to make the most of himself. You are an American, and all that you are, and all that you hope to be, reflects to the credit of a democracy.

That democracy is being assailed by the most damnable foe that ever fired a cannon, that ever drove home a bayonet, that ever ravaged a neutral state, that ever sunk a hospital ship, that ever shelled women and children in lifeboats, that ever crucified and castrated captured enemy soldiers, that ever cut the right hands off boy children in captured territory, that ever raped women by the thousand, that ever lived to fasten its demon clutches on the throat of civilization.

Almighty God will not permit the unleashed hellishness of Kaiserism to engulf the world. No sane thinking man can conceive of an all wise and loving supreme Deity permitting our section of the world to become under German leadership—the stench of the universe, but now, not tomorrow—right now—Almighty God needs the help of trained men.

It has been said repeatedly by men who ought to know what they are talking about, that this war will be won in the air. Uncle Sam is building an air fleet that will astound the fighting world. Factories from Maine to California are working day and night on aeroplane parts. Guns and oil and gasoline and cameras and other material parts of these war machines are coming along as fast as skilled organized American factories can bring them out. Already they are being assembled, and that acme of the American get-together spirit, The Liberty motor, is being installed.

Ever since this great war started the Government has been establishing aviation schools to perfect the bird men who will be the eyes of the national army. These schools have already turned out a mighty healthy number of those fearless chaps who can climb to dizzy heights, loop the loop, spiral with the engine cut off, repair a jammed machine gun, and get it into action before they reach the ground, and there are thousands more well on the road to their commissions, and they are getting into the seats of the new machines almost before the paint is dry on the initials U. S. A.

The machines and many of the fliers are taken care of, but there is a crying need of trained men to care for these machines, and those men will be forthcoming when the need is known.

But let's get down to cases. Do you drive an automobile? Thank God, if you do and enlist.

Do you know anything about a gasoline engine? Thank God, if you do and enlist

Are you a machinist or a machinist's helper? Thank God that your time in the land of the free has been spent learning a useful trade, and enlist

Do you know skilled men, and have you any influence with them? If you have, put that influence to work, put your shoulder to the wheel, remind yourself that war is now the business of America, and that we are threatened with all those things Germany has taught the world to expect from her. Spot your skilled men, and if they are not working on war essentials shoot some of your brand of Americanism into them

Men of draft age, if these remarks reach you, reach for your hat and start for the nearest recruiting station and enlist in the aviation section of the Signal Corps

If you are 18, 19 or 20 years old, enlist and become a man

If you are between 32 and 40 years of age and qualified enlist and become one of those who know no obligation greater than their love of country

There has never been a greater appeal to skilled men. There probably will never be a greater need of skilled men called upon to perform a duty so essential

In God's name, you skilled men, recognize this emergency. Know a need when you see one. Discern between German made news and American made news. This is no six months war. It is a fight between people and despotism, and it is a finish fight

Uncle Sam NEEDS skilled men. He [illegible] need you. In humanity's name, sign this blank with a hand that doesn't shake. It's an opening for a body blow at Autocracy

HERE IS A LIST OF THE KIND OF MEN WANTED

[illegible]

FROM THE EDITORIAL MAIL BAG

CO-OPERATION URGED TO RAISE OIL EMBARGO.

THE following statement has been issued by the Petroleum War Service Committee:

The public must expect a radical curtailment of public utilities, munition factories and all industrial activities dependent upon oil shipments, unless immediate relief can be had from the embargoes the railroads have placed against the movement of tank cars, both loaded and empty.

The petroleum industry has, accordingly, made an urgent appeal to the Director General of Railways, at the very earliest possible moment to order the railroads to give the same preferred movement to tank cars that is being given to coal cars.

So much attention has been focused on the shortage of coal that the public and the railroad authorities may have lost sight of the fact that fuel oil, gasoline and lubricating oils, are just as essential to the industrial and domestic life of the country as coal. In fact, industrial plants with a full coal supply cannot run without oil.

Unless some radical steps are taken to speed up the movement of tank cars for petroleum products, the railroads themselves will run short of lubricating oil. Already the failure of the railroads to haul tank cars has forced a number of plants to shut down for lack of petroleum products. The Pennsylvania Railroad, for instance, early in January, notified shippers that it would not accept for shipment tank cars loaded with fuel oil and other petroleum products.

While deliveries by tank cars under normal railroad conditions is 18,000,000 barrels a month, in December, due to the failure of the roads to haul loaded tank cars, or to return empty cars to loading points, the deliveries amounted to only 12,400,000 barrels, a deficit of 5,600,000 barrels, or 31 per cent. In January, according to the performance of the roads for the first 15 days, deliveries will show a decrease of 45 per cent as compared to the normal amount. The shortage in deliveries in December was greater than the entire production of gasoline and naphtha products in the United States during the same period.

Due to the shortage of coal many plants are depending entirely upon fuel oil to operate their plants. Oil used to manufacture gas is an absolute essential at this time, when the demands for gas for domestic purposes—heating, lighting and cooking—are greater than ever before. A supply can be furnished to gas companies only by tank cars.

If the farmer, public utilities, shipyards and munition manufacturers are to secure adequate supplies to maintain their operations as at present, it is of the utmost importance that all of the present tank car equipment be utilized to its maximum carrying capacity. The Petroleum Committee feels that th should be brought most forcibly to the attention the governmental authorities, and representations this effcet have been made to the Director General Railways and to the Oil Administrator of the Fu Administration.

BULLETIN ON OIL ACCOUNTING

THE Bureau of Mines, Department of the I terior, has recently issued Bulletin No. 1 on "Cost Accounting for Oil Producers," l Clarence G. Smith.

In the Bulletin are set forth various methods whi may be employed in oil accounting. The explanatio and descriptions are couched in terms easily unde stood.

We quote the following statement by the auth of the paper:

"Prior to the actual development of an oil pro erty, it is difficult to determine the quantity of under the property and the rate at which this oil c be brought to the surface—factors that determine t ultimate value of the property. Consequently, the has been much confusion in devising accounting sy tems that, during the entire life of a property, w show costs and profits from which the producer c determine whether his property is being worked a profit or otherwise. The Bureau of Mines pu lishes this report in recognition of a distinct need f a simple treatise on accounting methods adapted the peculiarities of the petroleum industry."

DEVELOPMENT WORK IN TERREBONNE PARISH.

THE recent bringing in of the third large g well by the McCormick interests in Terr bonne Parish, La., one half mile west of the other two wells, has the tendency to increa faith in this territory, and should their fourth w which is now drilling four miles north of the prese wells come in with equal volume, New Orleans w be assured of an abundant supply of natural gas.

No effort is being made at present to finance t building of a pipe line to New Orleans, as the secu ing of sufficient material and labor at this time practically out of the question, but with the furth development of the field, there is no reason why Ne Orleans should not be numbered among the natu gas cities in the near future

If the end be well, all is well. Romanorum.

UNIQUE METHOD OF STARTING GAS ENGINES.

By T. J. HAUGHT

A FEW years ago while the writer was in charge of a plant consisting of eight high stage and six low stage gas compressors each direct connected to a 13x24 inch twin single acting gas engine, the following method was adopted for starting the low stage units.

A branch line from the discharge line to the high stage compressors was led around to the low stage compressors and was branch connected to the intake line of each pump between the pump and gate valve in suction line.

When starting one of the low stage units which due to the added friction and inertia of the larger parts were rather slow about starting with the gas and air mixture as the others were started, it was only necessary to admit the high pressure to the intake to the pump and the unit would immediately start off with a good rate of speed as soon as the valves were working the valve in starting line was closed and the discharge opened to the intermediate pressure and also to field or suction pressure.

Of course this method could not be employed on compressors having poppet or automatic valves but there is no reason that it is not applicable to different types of mechanically operated valves.

On one occasion when due to some wire trouble the entire plant shut down unexpectedly and the first attempt to start resulted in using the supply of mixture without making any headway at starting the high stage pumps were started in the same manner by emptying that part of the discharge line immediate to the compressors and admitting the intake from the field to the compressors. As soon as a unit was started the intake was shut off and the pump allowed to run without load until ready to load all or several of them when the gate in main discharge line was opened and the load then applied in the usual manner.

Of course this was a little extravagant as the gas required to start each pump was blown to the air but it was an emergency in which it was considered wise to get things going in the shortest possible time even at a sacrifice of economy.

When five or six units were started they were loaded and the balance started in the usual manner with the mixture under pressure which method is now or should be obsolete.

PROCEEDINGS RECEIVED

The printed proceedings of the thirteenth annual convention of the Southwestern Electrical and Gas Association held at Dallas Tex. April 1917 are being sent to members.

The volume contains complete reprints of the papers presented at the convention and verbatim discussions as well as reports of all committees of the various sections that make up the organizations.

WINNERS OF PRIZES IN CONTEST HELD AT BUFFALO CONVENTION

AT the Convention of the Natural Gas Association of America held in Buffalo N. Y. May 1917, seven prizes were offered for the best papers submitted. Just as this issue was going to press a list of the winners was received from the office of the Secretary of the Association. They are as follows:

1st Prize Mr. W. C. Kramer [illegible] Arkansas Natural Gas [illegible] Neb. $100

2nd Prize Mr. F. F. Schmidt [illegible] $75

3rd Prize F. F. Lehman [illegible] Manager [illegible] $50

4th Prize J. R. Shaffer [illegible] $25

5th Prize Mr. [illegible] $10

Mr. [illegible] Manager [illegible] Pittsburgh Pa.

6th Prize Mr. [illegible] $10

[illegible] Natural Gas [illegible]

Many excellent papers were presented and the committee found itself well supplied with deserving candidates for the prizes. It is the plan of the Association to publish in full all of the papers submitted in the near future as many of the operators with which the contestants are connected.

VALUABLE PUBLICATION IN OIL AND GAS FIELD

THE [illegible] Bureau of Mines has just issued Bulletin [illegible] entitled, The [illegible] This bulletin contains a vast amount of most interesting and valuable matter on oil and gas resources with numerous maps, pages of drilling records and advertising interspersed the pages being of unequal size.

In the year in which the world's supply of petroleum and gas must be measured by large and rapidly increasing rates of consumption, this volume [illegible]

The Bureau of Oil and Gas [illegible] at the close of the [illegible] The price is $2.50.

Push on—keep moving. Morton.

GOVERNMENT EXPERIMENT STATION AT BARTLESVILLE.

SECRETARY OF THE INTERIOR LANE has designated Bartlesville, Okla., as the location of the new experimental station of the Bureau of Mines for the investigation of problems relating to the petroleum and natural gas industries. The station is one of three new experimental stations for the establishment of which the sum of $75,000 was appropriated by the last Congress. The two other stations have been located at Minneapolis, Minn., for the study of iron and manganese problems and at Columbus, Ohio, for research connected with the ceramic and clay-working industries.

The selection of Bartlesville was due to its location in the heart of the great Mid-Continent oil and gas field. The selection was influenced also by the offer of a free site and by the raising of $50,000 by the citizens of the town. This sum of money will be applied to the building of offices and laboratories and the purchase of engineering and chemical equipment.

The technical staff of the new experimental station will study various problems having practical commercial application to the petroleum and natural gas industries, including questions of production, transportation, storage and refining of petroleum, and various problems connected with the technology of natural gas.

It has been the policy to establish experimental stations in different parts of the United States where various phases of the mining industries could be studied at first hand, such stations likewise serving as centers for keeping in close touch with the practical needs of the industries throughout the country. Several experimental stations have been established in the past for studying problems of mining, metallurgy and of other branches of the mineral industries. These have given excellent results and there have been increasing demands for the establishment of new stations to represent other districts and other phases of the mineral industries.

Bartlesville was selected by Secretary Lane because of its obvious advantage as an oil center and because of the financial aid proffered as well as the possibilities for State and local co-operation.

The purpose of this experimental station, is to aid in increasing the efficiency of the petroleum industry, and investigations are not to be limited to any one field nor to any one branch, but will cover problems of production, transportation, storage and refining and problems connected with natural gas. For the most part, the problems taken up will be directly applicable to commercial development, and where it is found necessary to start a field in theoretical research, such investigations will eventually lead into some practical application to the industry.

Though emphasis is to be laid on the practical side of the industry, some misconception may exist in the minds of many about what is of practical importance. In many phases of the industry, basic elementary facts necessary for the development of new processes or the increasing of efficiency in established processes are lacking, and in such cases it may be desirable to carry out investigations that are not in themselves directly practical though they will provide the knowledge upon which commercial results of tremendous value may be founded. Such investigations have provided the foundations for advancement made in engineering and in many industries and without them the wonderful strides made in our present civilization would have been impossible.

One of the greatest needs of the petroleum industry has been the co-ordination of scientific research with the practical side of the industry, for compared with other mineral industries, it has been singularly backward in this respect. Seldom does the practical man in the oil business realize how much of his every day work, his tools and equipment are derived directly or indirectly from the most scientific and abstruse technical and engineering investigations.

The station is aimed to act as an intermediary between the facts evolved by scientific investigations and the needs of the oil industries. That is, men will be employed who will be able to gather scientific data and find out how they may be applied to the practical needs of the industry.

The problems that may be attacked in such a station are endless. When one begins a close study of the industry, new problems and new means for increasing efficiency continually disclose themselves. In considering the problems presented, the difficulty will not be in finding problems, but in determining which problems should best be attacked first. Methods for extracting more oil from the oil sands, for determining the best spacing of wells, for estimating the future production of wells, for solving water problems, for reducing the evaporation losses in the field, in storage and in the refineries, dehydration of oils, cracking methods, reduction of fuel consumption and heat losses in refineries, and the recovery of gasoline from natural gas are but a few of the endless problems about which inquiries are made of the bureau every day by men in commercial life.

In order to make the work of this station most useful, continual co-operation will be needed from the industry. This means encouragement and recognition of the work going on, aiding the men with advice and information, suggesting problems, and at times co-operating in practical tests on the properties or in the plants of operating companies. The amount of benefit that the industry as a whole and each individual will derive, will depend largely on the encouragement and assistance rendered the station. It is, therefore, largely dependent on the industry itself how successful this experimental station will be and how much the members of the industry will individually and collectively be benefited.

Truth is as impossible to be soiled by any outward touch as the sunbeam. Milton.

Completing of Great Project

Great Pipeline for Natural Gas Constructed by Doherty Interests in Record Time — Interesting Account of How the Work Was Accomplished.

BY R. C. MORRISON.

COMPLETION within a trifle more than four months of 113 miles of new pipeline by the gas organization of the Empire Gas & Fuel Companies of Kansas City, Mo., and Bartlesville, Okla., will be among the notable natural gas achievements of 1918 in the Mid-Continent section. The forty-three miles of 16-inch line joining the Blackwell, Okla., field to the Empire system, recently placed in service, was the last of the improvements finished.

Beside the Blackwell field two other gas fields were made a part of the Empire's system of 3,000 miles of supply pipeline—the Osage-Hominy field and that in Northern Oklahoma developed by the American Pipeline Company, which was purchased in November by Cities Service Company, Henry L. Doherty's holding company and parent organization of the Empire. The American properties were fifty miles of new pipeline, mainly 12-inch; 288 square miles of leased gas territory; a modern compressor station at Caney, Kansas, and a private telephone system.

The three new fields will better materially the supplies of gas in cities and towns in Missouri, Kansas and Northern Oklahoma embraced by the Empire system—a market with a population of one and one-half million. Construction of the new lines, which, by the way, represent an expenditure of more than two and one-half million dollars, was pushed from the very beginning of work September 10, and it is believed a new mark has been set for rapid pipeline building.

In crediting the Empire gas division with having established a record, consideration should be given the difficulties of rugged country and unfavorable weather, the pipe shortage, the almost unprecedented scarcity of men and abnormal shipping conditions, under which the work was done. Further, in addition to building 113 miles of new line, seventy-five miles of pipe for the work was reclaimed from the ground. The two phases of the work—reclamation and construction—went forward simultaneously.

CUT FOR BLACKWELL LINE AT SILVER CREEK. SITE OF WALNUT RIVER CROSSING IN SOUTHERN KANSAS.

The Blackwell line was completed in adverse weather that scarcely could have been less favorable. The severe storm of January in the Mid-Continent region, with its heavy snow and below-zero temperatures, placed a burden on the men that required all their energy and zeal to carry. In some of the worst weather they worked at opening roads for hauling of

Nothing is so difficult but that it may be found out by seeking. Terence.

pipe, cleaning ditch and even at pipe laying. The result was that many became ill from exposure.

More than half of the 43-mile Blackwell line was laid in hills and upland prairies of Southern Kansas, where it was necessary to use dynamite to open a ditch for the line. Several of the hills were of sheer limestone, rising perpendicularly to a height of forty or fifty feet. Others were less steep. But in all of the hill country there was rock and it required ten tons of dynamite to blast out the ditch for that section of the improvements alone.

The bluff at Silver Creek crossing, three miles southwest of Burden, Kansas, was perhaps the most difficult of the ascents. A blasting gang worked there a month, in solid limestone, opening a way for the line. When the work was finished two tons of dynamite had been used and the ditch had been shot away to a depth of thirty feet.

The Arkansas River, which the line crosses near Arkansas City, Kan., constituted more than a geographical division of the work. The hilly country was north of that stream; south of it the right of way led through comparatively smooth, loamy farm land. The latter condition gave the opportunity for the use of a 19-ton ditching machine which plowed a ditch forty-four by twenty-six inches at a speed of a mile in each twenty-four hours. With the machine, eight men did the work of 175, and did it better than it could have been accomplished by hand. It was the most extensive use ever made of ditching machinery in the Mid-Continent.

The Arkansas River crossing itself offered a unique problem. At the point of crossing the river bed is 1,300 feet wide, is sandy and treacherous in the spring of the year when the stream nearly always runs "bank full." The 16-inch line was divided into 10-inch lines for the crossing, each bowed against the current to provide greater resistive strength. The smaller lines were laid with screw joints, covered by rubber pack joints, in turn protected by one-half ton river clamps.

The Osage-Hominy line, a 12-inch, was laid under natural difficulties as great as those figuring in the Blackwell line construction, with the exception that it was completed in November, before the weather turned against the pipeliners. It is in the heart of the rugged Osage Nation, a section of Northern Oklahoma widely known for its wild and all but impassable hills. The Hominy line joins the system at the Empire compressor station at Bigheart, Okla.

Men for the big undertaking were recruited in Chicago, San Francisco, Cincinnati, Galveston and other cities nearer the scene of the work by Empire employment agents. That was the only means of combatting the scarcity of labor that prevailed in the late summer.

The improvements proceeded under the immediate direction of Frank P. Fisher, assistant general manager of the Empire in charge of the gas division. In active charge of the work for Mr. Fisher was Ross M. Stuntz, superintendent of gas pipelines.

SENSE AND CENTS.

What One-third Cent's Worth of Gas Will Do—Rate Thirty Cents per 1,000 Cubic Feet.

1. Will cook the cereal, boil the coffee and boil eggs for the breakfast of a family of eight.
2. Will toast fifty slices of bread.
3. Will bake enough biscuits for the breakfast of a family of eight.
4. Will heat an ordinary bedroom for one hour.
5. Will heat enough water for shaving for the average man for three weeks.
6. Will heat the baby's bottle for ten feedings.
7. Will heat milady's curling iron every day for a month.
9. Will furnish twelve gallons of hot water.
10. Will furnish three hours' continuous ironing.
11. Will cook enough soup for a family of eight.
12. Will fry chops for two meals for a family of eight.
13. Will heat and operate a large domestic oven for half an hour.
14. After being heated, it will operate the oven for three-quarters of an hour.
15. Will singe twenty chickens.
16. Will fry four chickens.
17. Will fry enough waffles for eight people.
18. Will boil enough potatoes for a family of eight.
19. Will sterilize fourteen gallons of water for drinking purposes.
20. Will operate a Rutz lighter for three days—lighting the top burners as many times as would be necessary where a gas stove is used for preparing all the food of a family.
21. Will operate three large upright mantle lamps for one hour.
22. Will make six pounds of ice.
23. Will operate a one-horse-power gas engine for forty minutes.
24. Will operate a one-horse-power gas-fired steam boiler for thirteen and a half minutes.

What Three and One-third Cents' Worth of Gas Will Do—Rate Thirty Cents per 1,000 Cubic Feet.

1. Cook a five course dinner for six persons, as follows: (a) Cream of asparagus soup, toasted bread sticks; (b) creamed fish, mashed potatoes, sandwiches; (c) prime roast of beef (five pounds), lima beans, scalloped tomatoes, cauliflower with white sauce, baked yams, corn muffins; (d) grape fruit salad French dressing, crackers; (e) fancy charlotte.
2. Bake thirty biscuits and broil a three-pound steak for 1 cent or five times that quantity for five cents.
3. Bake one four-layer cake with chocolate filling for 1 cent or five four-layer cakes for five cents.
4. Bake five large angel cakes at five different times.
5. Fry one hundred waffles.
6. Heat water for eight hot baths in summer, five in winter.
7. Cook three meals for six persons.
8. Run a gas iron twenty hours.

Despatch is the soul of business. Chesterfield.

Natural Gas Service

A Series of Several Articles Bearing Upon the Subject Indicated Were Written for Customers of the Central Indiana Gas Company.

A DISTINCTIVE AND COMPLEX BUSINESS

GREAT SAVING IN FUEL BILLS

establishing beyond question the productiveness of the field and the capacity of the transportation and distribution systems to deliver the gas to the consumers.

During the entire period, covering three winter seasons, and extending into the fourth one, the peak-load of the coldest day was carried easily and there was more than enough gas for everyone. Careful estimates support the statement that during the past three years this company has by substituting natural for artificial gas in the towns and cities served, saved its customers in fuel bills the sum of one million dollars, an average of about one thousand dollars per day. This large saving was effected in the actual difference in price between the natural gas and the fuel it displaced. It does not take into account the indirect economies brought about by the cleaner, more convenient and more efficient product, nor the substantial competitive advantage it has undeniably given to the manufacturers of this section.

Three years of uninterrupted perfect service is something to point to in any line of industrial effort, especially in a business subject to the great peak-load demand of house-heating in cold weather, and when it can be shown that the patrons of the company have been saved a thousand dollars a day in fuel cost while it was going on. This is a large item to be applied on the credit side of the natural gas service account when considering the temporary interruptions that are always possible and sometimes occur, no matter how strenuous the effort to prevent them.

HOUSE HEATING CAUSES TROUBLE.

One of the characteristics of natural gas service is that wherever it has been introduced as fuel, the price has been low enough to permit its use for heating houses in winter. Herein is one of its most distinctive features and the one, in fact, which causes the greater part of the trouble, when trouble occurs, for all concerned. Notwithstanding its far greater heating power per cubic foot, ranging from 150 per cent. to almost double the heating value of artificial gas, natural gas always has been sold at a much lower price than artificial gas, and even in normal times of fuel demand and supply is a competitor of coal and other solid fuels for house-heating business.

Under ordinary circumstances, this load grows steadily larger and larger each year, as the people become more fully acquainted with the superiority and economy of the service. Long experience in the house-heating business has been a costly teacher to natural gas companies, and they know there is no exemption from the possibility of interrupted service due to the enormous demand for gas for heating houses in severely cold weather. They are familiar with the discomfort and suffering that may result from a so-called "shortage" and they take every opportunity to warn their customers to provide themsolves with auxiliary heating appliances and be prepared. Too often their advice, even their pleading, in this matter, goes unheeded, and when the fatal day comes a large part of the population is caught with no preparation whatever.

The gas company never sleeps on this proposition. It does everything known to the business to minimize the hazard of the house-heating demand. Field operations, transporting lines, compressing stations, distributing mains —every part of the system is planned on a scale many times larger than normal weather would require, in order that there may be plenty of gas for house-heating on the one or very few coldest days of the year, when the demand may be five times, ten times or even fifteen times as great as in the summer months.

There is a reasonable limit, of course, to expenditures for this purpose, and if it were to be extended, the cost of delivering gas throughout the year would be greater than the public should pay. With ordinary fuel conditions prevailng, the modern natural gas company is able to take care of the tremendous household load on the coldest days in winter, as three years of uninterrupted and unimpaired service in central Indiana show.

It is evident that only extraordinary conditions should cause a break-down in natural gas service in the cities supplied from the West Virginia fields. It is also evident that when the abnormal demand caused by extraordinary fuel conditions is piled on top of the maximum normal demand of the coldest days in winter, the natural gas system is going to be overloaded. This hazard will exist as long as abnormal conditions continue and severely cold weather is possible.

"SHORTAGE" OFTEN DUE TO "OVERLOAD."

When the demand for natural gas exceeds the supply, the machine, though working perfectly, is overloaded—it slows down or stops until such time as the demand falls again within its capacity. Thus, the so-called "gas shortage" which has occurred and which will, no doubt, occur again in every city supplied with natural gas, is not truly a shortage of supply at all, but an overload caused by excessive demand.

When the demand for coal or other solid fuels exceeds the supply, the price goes up, the demand is curtailed by stricter economy and by turning to other fuels, the supply is stimulated, and eventually the balance is restored by these various adjustments. A situation of this kind in the supply and price of solid fuel now exists and is exerting direct influence on the natural gas business.

Everyone is familiar with the extraordinary fuel conditions that have prevailed for months, especially in the manufacturing centers of the East and Middle West. How the great industrial activity of the Nation increased the demand for fuel of every kind, more particularly coal and oil; how the railroads, congested by swollen traffic in food stuffs and the increased output of the very factories clamoring for fuel, have been unable to carry the overload, how the prices of coal and oil have gone up and up until they have become almost prohibitive where these fuels can be obtained at all—these things are matters of common knowledge.

Under such extraordinary conditions, it is not strange that the natural gas companies, still supplying their superior fuel at the same old price, should promptly be given their share, perhaps more than their share, of the overload. That they have been and are still able to pull this abnormal load with only the possible brief interruption due to a few days of extremely cold weather, is a significant testimonial to

their reserve capacity and the perfect working efficiency of their transportation and distribution systems.

It should be remembered that the gas company is the last to fail under the enormous demand for fuel, whether for house-heating or to keep the factory fires burning, though its price is fixed now far below the price of other fuels. The shortage in the supply of coal and the consequent high price of that commodity, necessarily results in the consumption of a much larger quantity of gas for house-heating than would otherwise be used, and has forced many factories to larger use of gas to avoid a complete shut down for an indefinite period. In fact, so serious are the present conditions of supply and delivery of solid fuels, it would be difficult for many factories to remain in operation, and the fuel situation in thousands of homes would be extremely alarming, were it not for the great quantity of natural gas being delivered throughout Western Pennsylvania, Ohio and Indiana. It is not too much to say that in the existing fuel crisis in this great industrial section natural gas is proving to be the "stand-by" that is saving the whole situation.

ECONOMIC VALUE OF NATURAL GAS GREATER THAN EVER BEFORE.

The high prices of coal, coke and oil, and the difficulty of obtaining commodities have produced conditions closely approaching industrial and domestic calamity in this section of the country. Try to imagine the extent of this calamity if the six hundred millions and more cubic feet of natural gas that are daily being sent from the West Virginia fields into a million or more homes and thousands of factories were non-existent or should cease. Try to calculate what would happen to these homes and factories if they were compelled to depend all through the winter upon such solid fuel as they could get at exhorbitant prices, in the face of the existing shortage.

It is not reasonable to assume that in the absence of natural gas service all these people would have provided themselves with coal for the winter before the shortage became apparent. A few would have done so, no doubt, but the great majority would have followed their former custom of waiting till cold weather to lay in their coal and would have been unable to procure it when needed. Even had great numbers been provident enough to place their orders early, the shortage would have come that much sooner and the general result for the season would have been equally disastrous.

Factories now running full and extra time would have been forced to close down or greatly curtail production, men would have been idle and without earning power, and discomfort would have existed in thousands of homes all through the cold weather instead of during the very few days of impaired gas service. It is only just to the natural gas business that this view of the subject be brought to public attention.

The efficiency of the system which make it possible for Central Indiana to have natural gas service was never greater than at this very minute. Not a single element of this great system has failed in its intended work during the stress of an extraordinary demand that during brief periods and under certain conditions is so great as to exhaust its capacity. This is shown by its resumption of perfect service the instant the abnormal strain is relieved.

The economic value of natural gas service in homes and industries was never as great as it is today. Never before has it done such important work as it is doing and will continue to do while present conditions of fuel supply prevail.

Service may be again interrupted—it probably will be before the winter is over—but those who provide against this contingency will not suffer any great discomfort and for the remainder of the year will continue to enjoy the convenience and economy of this best and cheapest of all fuels.

ARTIFICIAL GAS COULD NOT MEET THE DEMANDS OF NATURAL GAS.

The difference between natural gas service and artificial gas service is fundamental, though both are economically applicable to the same uses in many instances. Natural gas having been provided by nature in vast storehouses, may be procured in such large quantities and at such low prices that it is available as fuel wherever heat is required. It is subject, therefore, to enormous and sudden peak-load demand and the supply is depleted in direct proportion to its daily consumption.

Artificial or manufactured gas is applicable in much more restricted fields. The large investment required for plant capacity and the cost of manufacture prevent its general use for heating houses in rigorous climates and for the wholesale demands of industrial enterprise. The supply, however, remains constant up to the maximum limit of the manufacturing equipment and can be interfered with only by accident or temporary shortage of gas-making materials.

Being used principally for cooking, water-heating, lighting and minor industrial requirements, subject only to a demand that continues comparatively stable throughout the year, and being necessarily sold at a price that prevents wastefulness, artificial gas, for the purposes to which it is applicable, possesses certain elements of steadiness and satisfactory results that in the minds of many consumers make it superior to natural gas, though more expensive. In this latitude it has no place in the field of house-heating economy, except as a mere auxiliary to solid fuel equipment in the home.

When from any cause, such as failing supply, or frequent interruptions of service, a community is willing to forego the great benefits of natural gas for heating houses, it might be found advantageous to return to manufactured gas for domestic purposes and eliminate all possibility of shortage in winter or at other times. Against the higher price would be found the distinct advantage of more dependable service within narrower limits.

While any source of natural gas supply holds up, however—while the gas is transported and distributed by efficient systems under management of competent

organizations and while this cheap and valuable service is subject only to the occasional temporary interruptions that come from a combination of extremely cold weather and abnormal fuel conditions, such a radical move as a return to artificial gas service should be considered with extraordinary care. In many cities where natural gas has been substituted for the manufactured product, artificial gas plants are kept in operating condition as reserve. A return to the artificial service would not be difficult or a particularly serious matter for the companies, further than causing the surrender of a great volume of business. It is the public that would be most concerned in such a change and any modern progressive gas company would strive to meet the public desire whenever it is given expression.

CAPITAL INVESTMENT MUST BE WITHIN REASON.

The element of transportation is of over-shadowing importance in the production and delivery of natural gas. Most of the gas fields in various sections of the country are at considerable distance from the centers of population and industry to be supplied. Before the gas can be marketed, great lines of large pipe must be laid, often in mountainous country, under rivers, over hills and valleys. To accelerate the flow of gas and to build up "pressure" or "storage" that will meet the varying demand from hour to hour, powerful compressors must be installed along these lines and kept constantly at work.

In planning a transportation system for natural gas, the best engineering skill is utilized, combined with the experience of men who have spent many years in the business. It is necessary to give the lines the greatest possible capacity, with reasonable regard to the amount of capital investment that can be procured and supported by the income from sales of gas.

To obtain this income and make use of the product of the gas fields over wide areas, it is necessary to lay these pipe lines to points many miles from the wells. The towns and cities of Central Indiana, for instance, receive their gas from wells 300 miles distant in West Virginia. It is also necessary, from the standpoint of the investor and the public, that these lines and compressor stations be sufficient to meet the largest demand of all classes of consumers under normal or expected conditions.

It is possible to overload a gas transportation system, just as it is possible to overload a railroad, telegraph or telephone system. To build so extensively as to make an overload impossible at any time under any conditions, would be to tax the service, and, therefore, the public, with an investment burden that would in great measure destroy the usefulness and economy of the enterprise.

When there is an occasional "shortage" of gas during the very few coldest days of winter, it is quite natural for the consumer to ask why the company does not lay another pipe line. As a matter of fact, additional pipe lines are generally constructed at once when any inadequacy or lack of balance becomes apparent at any particular point in the system. But for a gas transportation company to greatly enlarge or perhaps double its capacity to meet an abnormal demand on one or a half dozen days in a year or several years, would be as unreasonable as for a railroad company to lay an extra line of main track to be used only for the same brief period. The public would have to bear the unjustified expense in the end, and the service would be unreasonably expensive all the year around. In a sense, the law of supply and demand would be violated by over-building and true economy would not be possible to such an undertaking.

LARGE SALES OF NATURAL GAS NECESSARY TO LIFE OF BUSINESS.

The animating idea behind every natural gas undertaking is, of course, to make money—to convey this splendid product from the fields to market and dispose of it under conditions that will give a fair return on the capital invested and a reasonable compensation for the skill, experience and risk involved. Unless these conditions prevail the service cannot be and remain satisfactory.

The vast sums of capital required can be procured only when it appears that the enterprise can be conducted at a profit. Interest charges, taxes, operating expense and depreciation of plant begin at the beginning and never cease. Risk of accident and shortage are always present.

Under these circumstances, natural gas companies find it necessary to make every effort to develop their business as rapidly as possible and to take on consumers as they come. Furthermore, the public utility business carries a moral obligation to serve all alike. To refuse or neglect to serve any particular class of customers desiring fuel would be violating the principles of public utility duty and restricting the growth of the business to a point that would make it unprofitable and eventually impossible.

If there were no industrial or house-heating consumption to contribute to the earnings of the company, the natural gas business would degenerate at once to an artificial gas basis. The price would have to be increased to a figure much higher per cubic foot than the usual price of artificial gas because of the higher heating value of the natural product and the smaller volume required to do the work. The lower cost of producing natural gas would be overbalanced by the great cost of transportation from the fields to the user. It would still be subject to possible interruption. It would not be as satisfactory to the public as first-class artificial gas service.

The idea has been advanced by students of public utility service that the final solution of the gas question will be found in artificial service for the cooking, water-heating, lighting and minor domestic fuel requirements of the home and the use of natural gas in the industries. This idea is based on the theory, no doubt, that the manufactured gas is equally satisfactory for domestic use, but that it cannot do the work required in factories, where natural gas produces

STOP BUYING--THEN WHAT?

WORK OF PETROLEUM COMMITTEE

Petroleum War Service Committee Meets with Dr. Garfield and Mr. M. L. Requa

The God who gave us life gave us liberty at the same time. Jefferson

Mr. Requa stated that it was his desire that the Petroleum War Service Committee should for the present continue its activities without change, to the end that there should not be any interruption in the continuous flow of petroleum products to the Allies or for our domestic uses.

In accordance with the above request that the Petroleum War Service Committee should continue to represent the industry and perform the functions previously committed to it, Mr. Bedford stated that the committee had agreed to continue to act and render every service possible.

The Petroleum War Service Committee has, to its regret, been advised of the resignation of Mr. Joseph F. Guffey, as the Petroleum Administrator for the War Industries Board. Mr. Guffey is President of the Natural Gas Association of America and is at the head of one of the vast gas producing companies having its headquarters in Pittsburgh.

Mr. Guffey had been handling all questions in connection with the purchase of Petroleum products for shipment to the Allied Governments.

The Petroleum Committee wishes to record in this formal manner its appreciation of the fact that it at all times found Mr. Guffey most painstaking in the discharge of his public duties. By reason of his intimate knowledge of the oil business and his broad-spirited disposition to engage the support of everybody concerned, it has been possible for the Petroleum Committee to co-operate harmoniously and effectively with the War Industries Board, with the result that during the past nine months, all of the requirements of the Allied Governments for petroleum products have been taken care of by the Petroleum Committee without any delay whatsoever.

TRUCKS AND TRAILERS.

HAULING, delivering and emergency-service are three great factors in the producing of profit or loss results in gas company service.

When it comes to light deliveries, the small trailer can be used successfully, to haul auxiliary loads behind light delivery cars, thus in many cases doubling the capacity of the automobile at only a nominal additional cost for trailer and power and maintenance.

Even though one buys the highest priced motor-equipment, there must necessarily be charges made against "power-plant" maintenance and repairs, for each motor car is a power plant within itself, and in many cases these charges mount into a considerable sum during the year.

There are engine repairs on the motor car, not only, but there is large tire maintenance, the cost of this latter is accentuated by virtue of the heavy load of the automobile itself, the weight of motor, etc. These, in addition to the carriage-load, the tires must carry.

The area in the body of the auto for the carrying of deliveries, is limited; Perhaps not over 50% of the length over all of the car, being available.

On the face of it one can see that to haul a trailer behind a light delivery car, means but one set of motor-maintenance-charges, it does not add tire expense more than as a nominal item, for the trailers are light, no *"traction"* is required of the tires, yet the *capacity* of the trailer is, *"over all,"* 100% of the vehicle area, with but a short pole coupling it to the automobile.

Note, therefore, that the capacity of a light delivery car, for carrying deliveries, may be *doubled* by using a trailer, at but a slight additional cost for maintenance, and with but a slight additional charge for fuel, and without adding to wages account for driver or for delivery assistant.

The pull is nominal, therefore the additional traction on the part of the delivery car is but a small item. In other words, trailers will, even when loaded, pull along on level road with one or two fingers of the hand acting as the pulling-coupling. A trailer is simply a roller, it rolls along with but a bit of power expended.

The gas field has found the automobile indispensable, and there remain for automobile manufacturers quantities of orders in the field, as quantities more of vehicles of this nature will be needed, than have yet been purchased. Then the trailer manufacturer is now simply coming into his own. He has both capacity and economy in his favor, as an auxiliary to the motor.

In this matter of motor cars and trailers reference should not be limited to simply light delivery cars and light trailers, for heavy cars plus heavy trailers are in just as economical and successful use, while the tractor or truck is performing other service, instead of holding the "power-plant" and expensive equipment of the truck, while the trailer is being loaded and the load discharged.

Motor-truck-manufacturers and trailer-builders are provided with endless data that may be made of value to those having supplies and equipment to haul. The gas interests are only now awaking to the exceeding advantage to be found in the trailer, though they are already showing appreciation of the value of motor vehicles in their business, by becoming liberal buyers of that type of equipment.

YOUR MISTAKES.

CAN you make something good come out of your mistakes?

Will you?

These questions assume that you make mistakes sometimes. It is, possibly, a compliment, for it is said "A wise man makes mistakes, a fool never."

Can you label that mistake so clearly in your mind that you will never forget it? Will you try to do so? If you will, you'll be making something good come out of your errors.

When you are convinced that you have made a mistake, own it, frankly and fairly. Your very frankness will dispel half the displeasure of your employer, or your customer—whichever the mistake affected.

A fair employer or a fair customer will condone one careless error where they would not be justified in overlooking many such.

Make your mistakes, taken to heart, count for something.

Our greatest danger lies in the neglect of duty, not in its performance.

Wise men say nothing in dangerous times. Seldon.

Oxy-Acetylene Welding

Remarks at the International Acetylene Convention
by Lucius S. Bigelow.

The President:—I have pleasure in calling on Mr. Lucius S. Bigelow, Editor and Publisher of two very important journals in the gas industry. One is called THE NATURAL GAS AND GASOLINE JOURNAL for artificial gas, and the other of these important publications is THE GAS INDUSTRY. We feel very much gratified to have Mr. Bigelow address us.

THE question of the cutting and welding of pipe in the gas fields is today one that is exceedingly important, especially in the natural gas field.

The old way was to haul as many Y's and T's, crosses and drips out into the field as it was thought would be required on a line. The construction work of some of those lines is carried on very many miles from any center. It was necessary to haul couplings on the pipe, and the fittings, of course, were in the aggregate very heavy. Nowadays in the natural gas field a very great deal of this work of providing T's and Y's and crosses, etc., is work of construction right in the field.

Your industry has a large opportunity in welding pipe lines and casings, and cutting up old lines and casings in the natural gas field, and it has a growing opportunity in the artificial gas field.

In the matter of manufacturing these parts, I would say that the work of manufacturing such fittings is often accomplished 40 or 50 miles from a railroad center in the field on the job. This saves the hauling of couplings and fittings of one kind and another that have heretofore been sent out on and with the pipe, so that alone in the matter of hauling there is great saving.

Then if there were any parts left over under the old system, it became necessary to haul those to some other point on the line or back to the supply base, so there was an additional hauling charge, whereas with only the pipe hauled into the field, and the construction work done on the job, only as many parts are built-up as are required for the work in hand.

You see there is no hauling away of things left over. There are no left-overs. It is very much like the boy who called on his friend for the core to the apple, and the boy said, "There ain't goin' to be no core." That is exactly the status of this work in the natural gas field.

Then again your welding has taken the place of fittings to such an extent, that it has made a decided change in the manufacturing field of fittings.

When it comes to pumping stations, regulator installations, etc., a natural gas line requires a very great many fittings. Every L and every T heretofore used meant a large piece because much of the pipe is large. Now they weld on the job instead of using those fittings. There again not simply on the straight pipe line but in that part of the work welding is taking the place of fittings.

Again, when they want to take up a line, it is not necessary that the lengths of pipe taken up, should be of the same length as were laid down, because we can cut the line into lengths just as we please.

I have known of certain cases where they have cut the old lines with oxy-acetylene to certain lengths to fit the cars, so that they could ship those pieces of pipe to best advantage away to other work. There is a convenience. As I say, in the gas field there is large opportunity.

Now, then, the recovery of gasoline from natural gas has become a very large operation. I know of one natural gas company that is recovering now 37,000 gallons of gasoline per day and selling it at about 20 cents a gallon. Most of that was lost because of the long distance lines and in the drip.

The percentage of loss in value of gas at the burning point through gasoline recovery is less than two per cent today, so that the gas companies are not robbing the consumers by recovering the gasoline. They are following a process of recovery which means conservation and economy, and therefore are serving the people faithfully, notwithstanding the fact that in some instances the public has the idea that the gas companies are robbing them.

In connection with gasoline recovery, this has meant the building up of a great many recovery plants. They have the absorption, and they have what is called the cracking process. The one is applied to casinghead gas, which is a wet gas at the oil well that has been generally wasted in order to get the oil, and the other is applied to dry gas, the gas that is generally used for burning. I don't mean by that that all dry gas has gasoline. Much Western New York gas has very little, but largely dry gas has gasoline in it, and its recovery has meant the building of a great, great many recovery plants.

These plants must all be built on lines, and must be connected with lines, and there must be piping in the structure. Nowadays instead of fittings, the plan is to use welding equipment. Here you see there is an added field in the natural gas enterprise.

When it comes to the matter of casing (the tube that is let down into the well as drilled) where casing was

er down with brought on a the fitting formed an obstruction on the outside of the casing and left the inside rough. whereas with welding the casing in lengths one after another is now lung up. The first length is lowered and the next section is then welded onto the head of the first section and lowered this section after section is welded and lowered without an obstruction on the outside of the pipe to interfere with the lowering of the pipe satisfactorily into the drilling, or lifting it from an old well to use it elsewhere, as the well itself there is a field of oxy-acetylene welding.

In the artificial field there is, as I said, a growing need by reason of the fact that whereas all of the artificial gas was formerly passed under low pressure through cast-iron pipe, much of that today is under high pressure, required for suburban service, and in the coupling of towns together on a main line or on laterals that are all steel or wrought-iron pipe.

With long-distance service in the artificial gas field, high-pressure service increases in demand, thus increasing the opportunity *there* for oxy-acetylene welding and cutting and the manufacture of T's, L's, crosses, etc., all of which pertains in that field as it does in the other.

It seems to me, therefore, that each of those fields of gas, because they are so entirely different, one from the other, each needs the direct and unremitting attention of the acetylene industry.

Some few companies have done missionary work in the gas field, and this work has brought about a knowledge of the possibilities to the gas-men in this type of construction, but it is one of the things that should be entered into, as generally by the welding interests.

BEAUTIFUL TRIBUTE TO TRAVELLING MAN.

HIS heart is light. He wears a smile. He is glad to see you. He holds his head up high. He is dressed in the latest fashion. He is clean within and without. He is good natured. He is smart. He has courage. He is an optimist. Beneath the beetle's horny shell, folded away out of sight, lies a pair of thin membranous, iridescent wings. Chafed by the warm southwest wind, it spreads them out in a summer evening and soars away in the mysterious distance. And the salesman, footsore, weary, tempted by an hour of solitude, forgets his goods and his line, shuffles out of the uniform you have learned to know and gives himself up to communion with his inner self. Look at him closely. These lines in his face did not all come from smiling. That droop in his shoulder did not come from holding it head up. The hand that grasped yours so gladly lies numb and limp. The courage that bid him face a lion in his den desert him when the expected letter from home does not appear. The optimist, the smart man, the man with the fund of good nature with whom he sits alone and lets his tongue for the kiss of the absent wife babe take the terse out of him.

When times are dull and when the business world is sour, when "nothing doing" stalks through the land a pestilence and paralyses trade, the salesman perpetuating the traditions of his calling continues to spread gospel of optimism that comes into its own at last. the smile and handshake of the salesman, his resourcefulness and versatility, his politeness and good fellowship are the very foundation stones of humanity in business.

But with all that, remember he is only human, and remember the beetle and its silken, sensitive, delicate wings which you cannot see; and when you turn a salesman down, don't forget that he is man, and that you are not being if you are not his brother.

THE SPIRIT OF SAFETY.

While the "Spirit of Safety" is Here Expressed, Let Safety Itself Be a Bodily Trait.

WHAT is it, this Spirit of Safety? We have heard and read considerable about the Spirit of Safety, but it is probable that all have not caught its real meaning and significance. We realize that, since the birth of industries, there has not been any phase of industrial activity which has accomplished more in all the years of its operation than has the Safety movement in its few short years of effort.

Why is this activity making for itself a place which ranks all others? It is because it is a common basis of thought and purpose. It is inspiring men to do things for their fellow men and for their families, to render an unselfish service and to recognize man-value in its true measure.

"Help the Other Fellow." That's the Spirit of Safety, and in the end that is what spells success. It brings out the best there is in every man and it strikes at the very source of poverty and misery, of oppression and gloom. It's the spirit that draws all men together by a common bond. It is a spirit of accomplishment worthy of the most sincere thought of the best minds and of the best thought and consideration of lesser minds, and is attained by a united purposeful effort of persevering men. It is reflected in the daily work and the home life of every man who is endeavoring to be guided by this Spirit of Safety; in more efficient work and better working conditions; in happier faces and more cheerful surroundings, in brighter homes and in more contented wives and mothers, because of the assurance of safety of husbands and sons; in better fed, better clad and better educated children.

Heed, then, the Spirit of Safety. Be cautious and careful of yourself; thoughtful and considerate of your fellow-men; kind and provident in your home and good things to all men. In these things lie the greatest achievements of right purpose and true success.

They that govern the most make the least noise. Selden.

Producing Gasoline

Casinghead Gasoline Industry Makes Great Strides Attaching Commercial Value to What Was Formerly Wasted.

THE producing of fuel from gas for driving internal combustion engines has so rapidly grown into an industry of vast proportions, as not easily to be comprehended. Many there be who have but a very indefinite idea regarding the industry which is divided into three sections, namely, gasoline recovered at the oil refinery, gasoline recovered from casinghead gas, and gasoline recovered from dry gas.

mulations of gasoline were kept to cleanse clothing of workers and for removing greasy accumulation from employes' hands, but the product which we nowadays so familiarly call "gas," namely, gasoline, and for which we pay in general from 24 to 27 cents a gallon, was then a drug on the market. To get rid of it was a problem that the producer was up against.

Let us jump over the intervening period and look upon the gasoline industry as of today.

RIVERSIDE-WESTERN OIL COMPANY'S GASOLINE PLANT NO. 2.

Small amounts of condensate, gasoline and water, were formerly obtained, collected largely from "drips" on gas pump lines, but there was in those days merely a limited demand for this by-product, and since its appearance in the gas was detrimental to the rubbers used in couplings, it was considered on that account and for other reasons, a nuisance.

Grease on the hands and overalls was found to give way when gasoline was applied, therefore small accu-

There are now plants scattered all over the country, recovering gasoline and selling it at what in those earlier days would have been considered fairy story prices, as unlikely to ever pertain as the submarine in the tale of Jules Verne, "Twenty Thousand Leagues Under the Sea."

The U-boat of today, changing entirely the method of warfare of the sea, and the internal combustion engine of aviation service, the new air factor, the auto-

mobile, and the gas power engine in general, parallel one another in the field of marvels, making use of gasoline in tremendous volume as was never anticipated by those who were the forerunners in the present gasoline field.

The gasoline recovery plants that are scattered here and there throughout the field, have not the appearance of great institutions, yet their equipment is such as to make them vast factors today, providing gasoline for the pleasure car, the commercial vehicle, the air armies of the entente and the allies, the submarines of both of these factions, the ambulances of today (doing work in a manner impossible with the old-time horse-equipped vehicle) the almost impregnable "Tank" used in approaching the enemies lines, over craters produced by exploding shells, and over trenches, and through barbed wire entanglements, etc., and as well in transporting armies, their supplies, munitions, etc., etc.

The gasoline plants of the country are of vital importance in this warfare of ours, and every man employed should feel himself of immense value to the government, and as much a part of the war mechanism as the man who throws the grenade, who fires the gas-bomb, who discharges the rapid firing gun, who operates big ordnance, who stand waist-deep in mud and water in the trenches; in other words, the men of the gasoline plants might be termed the men behi the internal combustion engine, as important in eve sense in their particular way, as the "men behind t gun," in their way.

A few illustrations of existing gasoline recove plants will indicate to those natural gas men who ha had little to do with field service, what some of the plants are like. We are showing several that ha been loaned us through courtesy of the Bessemer G Engine Company of Grove City, Pa.

NO. 4 PLANT OF RIVERSIDE-WESTERN OIL CO. NINE MILES WEST OF DELAWARE, OKLA.

RIVERSIDE-WESTERN OIL COMPANY'S NO. 5 PLANT N DELAWARE, OKLA.

Wishing, of all employments, is the worst. Young.

RIVERSIDE-WESTERN OIL COMPANY'S PLANT NO. 3 LOCATED NEAR ERAM, OKLA.

RIVERSIDE-WESTERN OIL COMPANY'S PLANT NO. 1.

INTERIOR VIEW OF GASOLINE PLANT NO. 1 OF RIVERSIDE-WESTERN OIL COMPANY.

The manly part is to do with might and main what you can do. Emerson.

MOVING IN CYCLES.

WE all realize in a general way that large sums of money being expended in the world today for army equipment, munitions of war, etc., are not getting away from the United States, yet few seem to realize fully the fact that in a very vast way this money is remaining in the United States, even though loaned through the United States government, by the peoples of this country.

We do not mention the foregoing in order to pat ourselves on the back as exceedingly clever people, but simply to indicate what is true, namely, that *our country is full of money,* and while living is high, wages are also high, and therefore to a large extent matters in general balance themselves.

Concerns that cannot advance their prices for one or another reason, and yet that must pay high prices for their raw materials, are among the unfortunate ones, bearing a burden that we all hope will be of more or less short duration.

In view of the fact that concerns in many instances have assumed the responsibility of having advanced their salary rates, and in view of the vast increase in price of raw materials, etc., there is one thing we must do—namely, be progressive, keep money moving and *keep business going.*

We must be judicious "spenders," and continue the judicious buying of products, thus to keep money in circulation, thus to keep everybody employed, and to insure incomes for all.

Even in these times the most desirable business is not long going to hunt the non-progressive business house, any more than in times of peace. The manufacturer must hunt his business, if he would have the type of patrons that he most desires.

No doubt an institution under present conditions may for a time without aggressive work find plenty to do, but what the wise manufacturer is after now is to build up a line of patrons that he considers "choice," and the only way to gain such, is to keep constantly before them ("out of sight, out of mind") and to actively go after their business. This is a time when manufacturers may be choosers, yet to be a chooser, one must make publicity and activity his motto.

The present sounds the call, *"build for the future."* There is plenty of money at hand with which to pay for progressive work, and the institution that uses a good reasonable portion of this "easy money" to make itself widely known, and to install itself securely with the best buyers in its particular line, is a mighty wise concern.

A concern that says, *"Because we have plenty of business now,"* or *"because we have more business now than we can cope with in view of shortage of raw materials, or because of difficulty in receiving and making shipments we will quietly settle down and keep still,"* is adopting the most approved ditch-digging method with which to excavate a commercial grave, in which to pla the self-satisfied, money-hedging-institution.

There never was a time better than the present which to make one's concern best known in its particul line of industry, since some will be "slackers" in tl direction even though they have plenty of money, a thus leave the field at the disposal of the active ones.

MARKING TIME.

ALL those who have had actual military experien and as well those who have stood by a watched troops that *ceased to move,* yet co tinued stepping, will know exactly what is mea by the expression, "marking time."

When troops are "marking time," *they are making progress;* they are wearing out sole leather, they are usi up energy, they are inviting fatigue. Just so in busine when enterprises mark time though they are not at actual standstill, they are not making progress, they a expending energy, without gaining ground, they a largely wasting the productiveness of their employ forces.

Commercial concerns cannot "mark time" witho losing ground, even though during the process of "mar ing time" the "overhead" is being taken care of in t income from that which is produced during that peri of semi-activity. Others, as a result, are overtaki and some passing, and there lies a fatal result.

Recently the manager of a concern in conversati regarding business, said, "We are marking time." I felt that the times required that his concern should so, but when the matter was carefully discussed, he car to see that to "mark time" meant to actually lose grou *in commercial lines,* since various of the other commerc interests in his field had not ceased to march on, a would thus leave him behind.

When left behind, it does not mean simply a lit more pressure, in order to catch up. It means excessi high tension, excessive wear and tear, excessive co way beyond simply reasonable normal activity that go with continued progressive advance. Where you g these forced conditions in order to catch up, such abnormal physical and mental fatigue, cost of abnorm aggressiveness, etc., it means excessive wear and tear an institution and its peopl.

The right way is not to "mark time." The right w is to keep on the move. We would offer the wor "Progress," rather than "mark time" as the slogan every concern in the United States during these w times, thus not allowing one's competitors to walk aw with the business in sight whether little or much, b cause they are progressing while others are "marki time."

The secret of success is constancy to purpose. Disraeli.

RESULTS OF DRILLING—LATEST REPORTS

PENNSYLVANIA FIELD

ALLEGANY FIELD

[illegible] Gas

BRADFORD FIELD

[illegible] Dry
[illegible] Gas
[illegible] Gas

[illegible] 8
[illegible] gas wells 2

MIDDLE FIELD

[illegible] Gas
[illegible] Gas
[illegible] Dry

[illegible] 1
[illegible] gas wells 2

VENANGO CLARION

[illegible] Gas
[illegible] Dry

Iefferson County

[illegible] Dry
[illegible] Dry
[illegible] Gas

[illegible] 1
[illegible] gas wells 2

BUTLER ARMSTRONG

[illegible] Dry
[illegible] Dry
[illegible] Gas
[illegible] Dry

[illegible] 1
[illegible] gas wells 2

SOUTHWESTERN PENNSYLVANIA

Washington

[illegible] Dry

Jacksonville

[illegible] Dry

Irwin City

[illegible] Dry
[illegible] Gas

Jefferson

[illegible] Gas
[illegible] Gas

Mattoon

[illegible] Dry
[illegible] Gas
[illegible] Dry

Mt Morris

[illegible] Gas
[illegible] Dry
[illegible] Gas
[illegible] Gas
[illegible] Gas
[illegible] Gas

[illegible] Dry
[illegible] Gas

WEST VIRGINIA

Monongalia—

[illegible] Gas
[illegible] Gas

[illegible] Gas
[illegible] Gas
[illegible] Gas
[illegible] Gas
[illegible] Gas
[illegible] Dry
[illegible] Dry
[illegible] Gas

Doddridge

[illegible] Dry
[illegible] Dry

Ritchie Co.

[illegible] Dry
[illegible] Dry

Wetzel and Tyler

[illegible] Dry
[illegible] Gas
[illegible] Gas
[illegible] Gas
[illegible] Gas
[illegible] Gas
[illegible] Gas
[illegible] Dry

Marshall Co.

[illegible] Gas
[illegible] Gas
[illegible] Gas
[illegible] Gas

Wood Co.

[illegible] Dry
[illegible] Dry

Ritchie Co.

[illegible] Dry
[illegible] Dry

Wetzel

[illegible] Dry
[illegible] Dry

Doddridge

[illegible] Gas
[illegible] Gas
[illegible] Gas
[illegible] Gas
[illegible] Gas
[illegible] Gas
[illegible] Gas
[illegible] Dry

[illegible] Dry
[illegible] Gas

SOUTHEASTERN OHIO

[illegible] Gas

Washington

[illegible] Gas

Meigs Co.

[illegible] Gas

Morgan

[illegible] Gas

Meigs

[illegible] Gas
[illegible] Gas

Life is not so short but that there is always time enough for courtesy — Emerson.

Athens Co.—	
Grovner, Geo. W. Ashburn & Co. 5	Dry
Morgan Co.—	
Penrose, Mosier & Co. 1	Dry
Marietta—	
Burton, Bush & Co. 1	Dry
Adkins, Alvin Adkins 7	Dry
Grimes, W. A. Decker 1	Dry
Beaver, Austin Oil 1	Dry
Edwards, Charles Hanlon & Co. 1	Dry
Riggs, J. H. Kiggins & Co. 12	Dry
Beech hrs., W. R. Metcalf & Co. 2	Dry
Rousch, Patterson Bros. 4	Dry
Cugle, S. J. Bogard & Co. 1	Dry
Herron, Taylor & Dye 1	Dry
Harrison Co.—	
Heavlin, Westgate & Black 1	Gas
Marinacci, Hugus & Sutton 1	Dry
Jefferson Co.—	
Burriss, Lewis & Co. 1	Dry
Belmont Co.—	
McKelvey, H. J. Gallager & Co. 1	Gas
Dry	18
Gas	3

PENNSYLVANIA FIELDS.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry	Gas
Allegany	7	13	0	1
Bradford	30	80	1	2
Middle Field	19	49	1	2
Venango-Clarion	34	41	3	2
Butler-Armstrong	15	15	3	2
Southwest Penna.	36	750	7	9
West Virginia	124	1,162	19	29
Southeast Ohio	76	589	18	3
Total	341	2,699	52	50

CENTRAL OHIO.

LICKING COUNTY.

Licking—J. L. Diltz, Columbus Nat. G. 1	Gas

KNOX COUNTY.

Pike—Earl Loney, Ohio Fuel Sup. 1	Dry
Morris—Anna J. Love, Upham Gas 1	Gas
Dry	1
Gas	1

ASHLAND COUNTY.

Hanover—Geo. Wolfe, Ohio Fuel Sup. 1	Gas
Mohican—Winbigler, Logan Gas & Fuel 1	Gas
Montgomery—Wile, Ohio Fuel Sup. 1	Gas
Gas	3

MEDINA COUNTY.

Litchfield—Scoville, Joe H. Artman 2	Dry
Brunswick—Ferriman, Ohio Fuel Sup. 1	Gas
Lafayette—Tuttler, Ohio Fuel Sup. 1	Gas
C. D. Whitman, Medina Gas & Fuel 1	Dry
Medina—F. E. Horton, Medina G. & F. 1	Gas
J. & K. Mate, Medina Gas & Fuel 1	Gas
John Walker, Medina Gas & Fuel 2	Gas
Dry	2
Gas	5

WAYNE COUNTY.

Congress—Miller-Spring, Logan G. & F. 4	G
Cannan—Badger, Logan Gas & Fuel 1	G
H. Bowman, Logan Gas & Fuel 1	G
Geo. Irvine, Ohio Fuel Supply 1	G
W. Davidson, Medina Gas & Fuel 1	G
Wayne—McDonald, Hartman & Co. 1	G
Clinton—Aylesworth, East Ohio Gas 1	G
Gas	

RICHLAND COUNTY.

Worthington—Forbes, Logan Gas & F. 1	I

CUYAHOGA COUNTY.

Dover—W. H. Lawrence, Logan G. & F. 2	G
C. W. Winslow, Melrose Oil & Gas 1	G
F. Cipra, Melrose Oil & Gas 1	G
J. &. H. Borth, East Ohio Gas 2	G
Geo. Elliott, East Ohio Gas 1	G
Gas	

VINTON COUNTY.

Richland—Atwood, Ohio Fuel Supply 2	G
Luther H. Stone, Ohio Fuel Sup. 1	G
Gas	

PERRY COUNTY.

Thorn—W. A. Boring, Ohio Fuel Sup. 4	G
Wm. Culp, Heisey Gas 2	G
School lot, Heisy Gas 1	G
Gas	

HOCKING COUNTY.

Salt Creek—Tisdall, Logan Gas & Fuel 4	G
D. Karschner, Ohio Fuel Supply 1	G
Gas	

HOLMES COUNTY.

Ripley—T. & I. Hague, Medina G. & F. 2	G
Washington—Sprang, Logan G. & F. 1	G
Gas	

COSHOCTON COUNTY.

Mill Creek—Shoemaker, Medina G. & F. 1	G
Guy Crawford, Medina G. & F. 2	I
Dry	
Gas	

CENTRAL OHIO FIELDS.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry	G
Licking	1	0	0	
Fairfield	0	0	0	
Knox	2	0	1	
Ashland	3	0	0	
Medina	7	0	2	
Lorain	0	0	0	
Wayne	7	0	0	
Richland	1	0	1	
Cuyahoga	5	0	0	
Vinton	2	0	0	
Jackson	0	0	0	
Perry	3	0	0	
Hocking	2	0	0	
Holmes	2	0	0	
Coshocton	2	0	1	
Marion	0	0	0	
Total	37	0	5	

All that is human must retrograde if it do not advance. Gibbon.

LIMA FIELD

WOOD COUNTY

[illegible] M. I. Donehy, Brennan Oil 31 — Dry
[illegible] I. McCullough, Sun Oil 14 — Dry
[illegible] Johnson, W. F. Johnson 2 — Dry

Dry 3

INDIANA FIELD

DELAWARE COUNTY

[illegible] Thrap Thomas H. Condon 1 — Dry

RANDOLPH COUNTY

[illegible] Humphries Meeks Gas 1 — Dry

PIKE COUNTY

[illegible] John N. Sutton Ohio Oil 6 — Dry
[illegible] Smith M. Murphy estate 6 — Dry
[illegible] Mrs. M. Murphy estate 6 — Dry
[illegible] Trapler Sore & Moreland 1 — Dry

Dry 4

SULLIVAN COUNTY

[illegible] Springer Ohio Oil 1 — Dry
[illegible] I. R. Riggs 1 — Dry

Dry 2

INDIANA FIELD

SUMMARY OF COMPLETED WORK

	Dec.			Nov. 17		
	Comp.	Prod.	Dry	Comp.	Prod.	Dry
[illegible]	1	60	1	6	1	6
[illegible]ware	1	1	1	0	0	1
Randolph	1	0	1	0	0	0
[illegible]	2	110	1	3	150	2
Pike	11	1[illegible]	4	5	80	1
[illegible]	5	2[illegible]	2	3	115	2
Wayne	0	0	0	1	2	0
Other	0	0	0	2	84	1
Total	21	6[illegible]	9	11	43[illegible]	13

KENTUCKY TENNESSEE

WAYNE COUNTY

[illegible] Smith, Wood Oil 2 — Dry
[illegible] Lewis Neely 12 — Dry

Dry 2

WOLFE COUNTY

[illegible] Phil Wynn 1 — Dry
[illegible] White Bros. & Huff 2 — Dry

Dry 3

MORGAN COUNTY

[illegible] City—Frank Hudson, Oklahoma Kentucky
[illegible] — Gas

[illegible] Dry
[illegible] Gas
[illegible] Gas production

ESTILL COUNTY

Irvine C. Rice, Empire Oil & Gas 11 — Dry
Bud Rawlins, Crown Oil 34 — Dry
Geo. M. Reed Sr., Ohio Oil 8 — Dry
Geo. Reed, Ohio Oil 1 — Dry
A. J. Rawlings, Crown Oil 31 — Dry
A. J. Rawlings, Crown Oil 33 — Dry
Wm. Clay, Crown Oil 6 — Dry
Wade Parks, Clark et al 4 — Dry
John Reed, Stanton Oil 1 — Dry

Dry 9

POWELL COUNTY

Pilot, J. M. Nobles, P. J. White 42 — Dry
H. C. Baker, Pilot Knob Oil 11 — Dry
A. Stewart, Beckett Iseman Oil & Gas 1 — Dry
S. Hall, Ohio Valley Oil 1 — Dry
S. Hall, Ohio Valley Oil 2 — Dry

Dry 6

LEE COUNTY

Barbourville, S. S. Quillen, Reed & Schumacher 1 — Dry
J. D. Kincaid, Illinois Oil 1 — Dry
Whiteman, Kentucky Petr. & Pet. 2 — Dry

Dry 3

ALLEN COUNTY

[illegible] — Dry
[illegible] — Dry
[illegible] A. Edwards — Dry

Dry 3

WHITLEY COUNTY

[illegible] — Gas

McCREARY COUNTY

[illegible] — Dry

LINCOLN COUNTY

[illegible] — Dry
[illegible] — Dry

Dry 2

JOHNSON COUNTY

[illegible] — Dry

WARREN COUNTY

[illegible] — Dry

PULASKI COUNTY

[illegible] — Dry
[illegible] — Dry
[illegible] — Gas

Dry 3
Gas 1

LOGAN COUNTY

[illegible] — Dry
[illegible] — Dry
[illegible] — Dry

Dry 3

JACKSON COUNTY

[illegible] — Dry

Straight venture, straight hole. Tenn.

BOYLE COUNTY.

Junction City—Sutherland, Berwald et al. 1 ..... Dry

OWSLEY COUNTY.

Boonville—Turkey Foot Lumber, Henry Oil 1 ..... Dry

GRAYSON COUNTY.

Leitchfield—Majors, Carl Dresser 1 ..... Dry

MADISON COUNTY.

Red House—Cobb, Parks & Bunch 1 ..... Dry

LA RUE COUNTY.

Silvia—Crabtree, W. Tempelman et al. 1 ..... Dry

MONTGOMERY COUNTY.

Willoughby—Mt. Willoughby, Leod et al. 1 ..... Dry

GREENUP COUNTY.

Seaton, Unknown parties 1 ..... Dry

MARION COUNTY.

Bradfordsville—Jones Fork, Unknown 1 ..... Dry

TAYLOR COUNTY.

Campbellsville—Davis J. W. Cashdollar 1 ..... Dry

GREENE COUNTY.

Whitewood—White, Morrison Develop. 1 ..... Gas
R. A. White, Morrison Development 2 ..... Gas
C. Buchanan, Morrison Development 1 ..... Gas
Joe Vance, Morrison Development 1 ..... Gas
Versailles—Field, J. H. Kearney & Son 1 ..... Gas

Gas 5

KENTUCKY-TENNESSEE.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry
Wayne	2	0	2
Wolfe	5	40	2
Lawrence	3	18	0
Morgan	2	0	1
Estill	28	219	9
Powell	35	569	5
Lee	14	229	3
Bath	3	15	0
Allen	12	365	3
Floyd	1	1	0
Metcalf	1	5	0
Whitley	1	0	0
McCreary	1	0	1
Lincoln	4	10	2
Knox	4	35	0
Johnson	1	0	1
Warren	1	0	1
Pulaski	3	0	2
Logan	3	0	3
Jackson	2	25	1
Boyle	1	0	1
Owsley	1	0	1
Grayson	1	0	1
Madison	1	0	1
LaRue	1	0	1
Simpson	1	5	0
Montgomery	1	0	1
Greenup	1	0	1
Marion	1	0	1
Taylor	1	0	1
Monroe	1	5	0
Greene	4	0	1
Woodford	1	0	0
Total	142	1,541	45

ILLINOIS FIELD.

CLARK COUNTY.

Casey—W. Dehl, Hudson Oil 22 ..... Dry
Koughest, Geo. H. Stahr et al. 4 ..... Dry

Dry 2

CRAWFORD COUNTY.

Oblong—W. D. Walker, Mahusta Oil 15 ..... Dry
W. D. Walker, Mahusta Oil 16 ..... Dry
Prairie—S. S. Green, Watson et al. 2 ..... Dry
C. W. Daron, McNally et al. 1 ..... Dry
A. L. Maxwell, Sheets et al. 4 ..... Dry

Dry 5

LAWRENCE COUNTY.

Dennison—J. J. Buchannan, Fisher Oil 1 ..... Dry
Petty—Piper, Snowdon Bros. et al. 31 ..... Dry

Dry 2

CLINTON COUNTY.

Carrigan—W. S. Gerrish, F. J. Casey 1 ..... Dry

WABASH COUNTY.

Friendship—Price, Midland Oil & Gas 1 ..... Dry

KANSAS.

MONTGOMERY COUNTY.

33-34-15, Grother, Mahutska & Samuel 3 ..... Dry
28-34-15, Grother, Mahutska & Samuel 4 ..... Gas
16-33-15, McGuston, A. S. Riley 2 ..... Dry
19-34-17, Berkhart, Ed. Karns 2 ..... Dry
29-34-17, Day, Jesse Graham 2 ..... Gas
11-24-15, Gordon, National Ref. 1 ..... Dry
10-33-14, Fee, Frankston Oil 2 ..... Gas
17-27-14, Wilson, Tidal Oil 10 ..... Dry
17-24-14, Wilson, Tidal Oil 11 ..... Dry
4-33-15, Robinson, Northland Oil 3 ..... Dry
19-33-14, Sullivan, Rothrock, Dickens & Jones 1 ..... Dry

Gas production 500,000
Dry 8
Gas 3

BUTLER COUNTY.

16-25-5, Robinson, Theta Oil 1 ..... Dry
8-27-4, Kollenberg, Peoples Oil & Gas 1 ..... Dry
9-27-5, Marshall, Gold Dollar Oil 1 ..... Dry
14-27-5, Morgan, Morgan Oil 1 ..... Dry
18-28-4, Freed, Freed Oil & Gas 4 ..... Dry
22-28-4, Varner, Empire Gas & Fuel 7 ..... Dry
29-28-4, Chance, Empire Gas & Fuel 2 ..... Dry
1-27-4, Churchill, Cosden & Co. 1 ..... Dry
34-24-5, Hill, Bradford et al 1 ..... Dry
14-28-4, Shreve, Mid-Kansas Oil 16 ..... Dry
34-24-5, Hill, R. H. Hazlett 1 ..... Dry
22-28-4, Brown, Monitor Oil 5 ..... Gas

Dry 11
Gas 1
Gas production 1,000,000

CHAUTAUQUA COUNTY.

11-34-11, Tout, Tulsa parties 3 ..... Dry
Near Peru, W. F. Lemmon 1 ..... Gas
13-33-12, Aiken, Link Oil 2 ..... Dry
34-32-13, Gilbert, Sachem Oil 1 ..... Dry
23-32-12, Holladay, Mary Holladay 1 ..... Gas
8-35-12, Mayfield, Osage-Cherokee Oil 2 ..... Dry
5-35-12, Paulus, E. A. Durham 14 ..... Dry

The greatest of faults, I should say, is to be conscious of none. Carlyle.

[illegible] Madden Richard [illegible] Dev
[illegible] Howell Sachem Oil [illegible] Gas
[illegible] Powell Eva J Argue [illegible] Dev.
[illegible] Stephens N J Hay et al [illegible] Dev.
[illegible] Flood Kewanee Oil [illegible] Dev.
[illegible] Hewitt, Elgin Oil [illegible] Dev
[illegible] Vaughn Walter Argue [illegible] Dev.

[illegible]

production [illegible]

NEOSHO COUNTY

[illegible] Reed J H Evans & Sun [illegible] Dev
[illegible] Forghart Commonwealth Oil [illegible] Dev.
[illegible] Eagle Republic Oil & Gas [illegible] Dev
[illegible] Kesler & Johnson Riverside Oil & Gas [illegible] Dev
[illegible] Engel Republic Oil & Gas [illegible] Dev

MIAMI FRANKLIN AND DOUGLAS COUNTIES

[illegible] Cunningham Electric Oil & Gas [illegible] Dev
[illegible] Hunter Greystone Oil & Gas [illegible] Dev.
[illegible] Davis Walnut Oil & Gas [illegible] Dev
[illegible] Crane J F Wolff [illegible] Dev.
[illegible] Perry Miami Oil [illegible] Dev.
[illegible] Davis Walnut Creek Oil & Gas [illegible]
[illegible] Rademoff R O [illegible] Dev
[illegible] Perry Wood [illegible] Dev.
[illegible] Lathan W R Butler [illegible] Dev
[illegible] Rieser Davis Oil & Gas [illegible] Dev.
[illegible] Smith Valentine Oil & Gas [illegible] Dev
[illegible] [illegible] Gas

WILSON COUNTY

[illegible] Lange Miller [illegible]
[illegible] Martin Davis Oil & Gas [illegible]
[illegible] Argo P O & Gas [illegible]
[illegible] McClarren Casey [illegible]

WILDCATS

Coweta
[illegible] Swaney Davis & [illegible]
[illegible] 4 Counts
[illegible] Sample Davis & Gas [illegible]
Coweta
[illegible] Wilson Applegate [illegible] & [illegible]
[illegible] Woolf Sanders [illegible]
[illegible] Swaney Davis [illegible]
[illegible] 4 Counts
[illegible] Swaney Wasserman [illegible]
[illegible] Sample Davis & Gas [illegible]
[illegible] Johnson Battle Creek [illegible]
[illegible] Johnson Davis [illegible]
[illegible] Markham Davis [illegible]
[illegible] Rubins Wilson [illegible]
[illegible] Johnson Davis & Walker [illegible]

[illegible]

OKLAHOMA

WASHINGTON COUNTY

[illegible] Shellberg & Sons [illegible]
[illegible] Cattenden [illegible] & Walker [illegible]

[illegible] Mallard [illegible] Gas
[illegible] Davis [illegible] Dev

[illegible] Dev
[illegible] Gas
[illegible] Gas production [illegible]

CHEROKEE SHALLOW SANDS

[illegible] Palmer Amalgamated Petro [illegible] Dev
[illegible] Warman Warrington & Gas [illegible] Dev
[illegible] Davis Oil [illegible] Dev
[illegible] Harman Warren Gas & Oil [illegible] Dev
[illegible] Pearman Kramer Oil & Kansas [illegible] Dev
[illegible] Foreman Carter Oil [illegible] Dev
[illegible] Palmer Oil Corporation [illegible] Dev
[illegible] Walter Davis [illegible] Dev
[illegible] [illegible] Schaeffer et al [illegible] Dev
[illegible] [illegible] Gas Corporation [illegible] Dev
[illegible] [illegible] Oil & Gas Co [illegible] Dev

[illegible] Dev

OSAGE COUNTY

[illegible] [illegible] Davis Osage National [illegible] Gas
[illegible] Wilkinson [illegible] Dev.
[illegible] Kendall [illegible] Dev
[illegible] [illegible] Oil & Gas [illegible] Dev
[illegible] [illegible] [illegible] Gas
[illegible] [illegible] Dev
[illegible] St Louis & Gas Corporation [illegible] Dev
[illegible] Wilson Wilson [illegible] Dev

[illegible] Dev
[illegible] Gas
[illegible] Gas [illegible]

TULSA CREEK POOL BIRD AND KELLYVILLE

[illegible] Dev
[illegible] Dev
[illegible] Dev
[illegible] Dev
[illegible] Gas
[illegible] Dev
[illegible] Dev
[illegible] Dev
[illegible] Dev
[illegible] Dev
[illegible] Dev
[illegible] Dev
[illegible] Dev

They're only truly great who are truly good. Chapman.

22-16-13, Bear, R. Mook et al 1 ..... Dry
11-16-14, Ward, Sherman & Craig 1 ..... Gas
19-18-13, Clifford, Moss & Bailey 1 ..... Dry
19-18-13, Pittman, Moss & Bailey 1 ..... Dry
28-19-12, Yargee, Pennok Oil 3 ..... Gas
20-19-12, Colbert, Kilmer et al 8 ..... Dry

Dry 38
Gas 8
Gas production 28,000,000

MUSKOGEE, WAGONER AND ROGERS COUNTIES.

10-21-14, Young, W C. Brusey et al 2 ..... Dry
28-14-16, Brown, Lochiel Oil & Gas 2 ..... Dry
22-13-16, Thompson, Pelican Oil & Gas 2 ..... Dry
22-18-15, Apuelka, Fox et al 2 ..... Dry
25-17-14, Riverbed, Davis & Younger 5 ..... Dry
25-18-14, Nave, Cunningham et al 12 ..... Dry
25-16-14, Harrison, Reagan, Peterson et al 1 ..... Dry
11-13-15, Sevier Navajo Petroleum 2 ..... Gas
34-15-16, Richards, Minneokla Oil & Gas 1 ..... Gas
25-16-14, Gypsy Oil ..... Dry
31-15-15, Mayson, Okla. Oil Wells 3 ..... Dry
36-15-16, Durant, Okla. P. & R. 1 ..... Dry
3-14-15, Capps, Rose et al 1 ..... Dry
11-13-15, Baxter & Winemiller 1 ..... Dry
30-15-16, Howard, Boynton Oil & Gas 5 ..... Gas
23-15-15, Friday, French et al 2 ..... Dry
17-15-16, Fields, Melba Oil 3 ..... Dry
28-18-15, Apuelka Fox Hall et al 2 ..... Dry
18-14-17, Lewis, Eastern Okla. Prod. 1 ..... Dry
34-15-15, Franklin, Rose et al 2 ..... Dry
20-15-16, Givens, Kistler et al 1 ..... Dry
13-13-15, Choctaw Oil ..... Dry
11-13-15, Navajo Oil 2 ..... Gas
20-15-16, Taylor, Kistler et al ..... Dry
34-16-15, Richards, Minnetonka Oil 1 ..... Gas

Dry 20
Gas 5
Gas production 15,000,000

OKMULGEE-MORRIS.

29-12-12, Randall, Mitchell Oil 16 ..... Dry
1-14-13, Brandiger, S. Drew 9 ..... Dry
31-14-13, Haynes, Galbreath et al. 1 ..... Dry
4-14-14, Hudson, Okla Prod. & Refg. 4 ..... Dry
10-14-14, Stevens, Magnolia Petroleum 17 ..... Dry
16-15-14, Nelson, Selby O. & G. 9 ..... Dry
30-15-14, Starr, Magnolia Petroleum 15 ..... Dry
34-13-14, Fat, J. Ribold et al ..... Gas
11-16-12, Brown, Bailey 1 ..... Dry
27-16-13, Moore, A. Braden 1 ..... Gas
6-16-13, Murray, Hubbard et al ..... Dry
29-12-12, Randall, Mitchell et al. 16 ..... Dry
34-14-14, Fat, Mountain Rock Oil 3 ..... Gas
25-15-13, Kelley Caney River Gas 1 ..... Dry
24-13-10, Wolverine Oil ..... Gas
32-13-14, J. Ribold 3 ..... Gas
10-16-11, Lowe, Sunset Petroleum 1 ..... Dry
11-16-12, Barnett, Barley et al 1 ..... Dry
13-16-12, Welch, Terrell et al 1 ..... Gas
12-14-12, Douglas, Swindler et al 1 ..... Dry
22-14-12, Colbert, Fields et al 1 ..... Dry
30-14-12, Ulrich, Alexander et al 1 ..... Dry
7-13-14, Milan, Okla. State Oil 5 ..... Dry
34-13-14, Fat, J. Rebold et al 4 ..... Dry
3-16-12, Whetstone, State Petroleum 5 ..... Dry
15-14-12, Huckaby, Kimbley et al 1 ..... Dry
36-14-12, Haynes, King et al 1 ..... Dry
33-15-13, Robes, Tida Oil 2 ..... Dry
17-13-14, Tilliver, Okla. State Oil 5 ..... Dry
24-15-11, Cobb, Topaz Oil 2 ..... Dry
22-14-11, Thompson, Savoy Oil 1 ..... Dry
13-16-11, Postoak, J. O. Mitchell 1 ..... Gas

Dry 25
Gas 7
Gas production 30,000,000

BALD HILL AND BOOCH SANDS.

31-14-13, Hays, Kansas Drg. 1 ..... Dry
5-14-14, Rentie, Marion Oil 5 ..... Gas
29-14-14, Ashley, Sperry Oil & Gas 6 ..... Gas
30-14-14, Thomas, W. B. Pine 2 ..... Gas
10-14-14, Stevens, Magnolia Petroleum 17 ..... Dry
10-14-14, Dill, Magnolia Petroleum 17 ..... Dry
7-14-15, Rentie, Levine et al 1 ..... Dry
5-14-14, Rentie, Marion Oil & Gas 2 ..... Gas
33-15-13, Smith, Tidal Oil 2 ..... Dry
1-15-14, McIntosh, Texas Oil 4 ..... Dry
21-15-14, Osborne, Mass-Okla Oil 3 ..... Dry
32-14-14, Ashley, Hanson O. & G. 2 ..... Gas

Dry 7
Gas 5
Gas production 18,000,000

CLEVELAND, PAWNEE, MANNFORD AND JENNINGS.

11-20- 8, Mayfield, Jennings Bros. 5 ..... Dry
22-20- 8, Buel, Concord Oil 1 ..... Dry
14-20- 8, English-Okla. Oil 1 ..... Dry

Dry 3

CUSHING AND SHAMROCK.

10-18-7, Nettie, Texas Oil 4 ..... Dry
16-17-7, West, P. O. & G. 21 ..... Gas
30-17-7, Benson, Cushing Development 1 ..... Dry

Dry 2
Gas 1
Gas Production 3,500,000

GARFIELD AND NOBLE COUNTIES.

24-23-2, Deal, Hansen et al 1 ..... Dry

BLACKWELL, NEWKIRK AND PONCA CITY.

5-28-1, Briney 101 Ranch Oil 1, 2 ..... Dry
31-29-1, Schmidt, Jones & Buel 3 ..... Gas
30-29-1, Hobaugh, Junction Oil 1 ..... Gas
31-29-1, Smith, Bermont Oil 4 ..... Gas

Dry 1
Gas 3
Gas production 69,000,000

HEALDTON.

16-1-2, Murphy et al 1 ..... Dry
17-2-3, Nunnelly, Summit Oil 1 ..... Dry
29-2-3, Daugherty, Phillips Petroleum 4 ..... Gas
29-2-3, Pruitt, Gypsy Oil 1 ..... Gas
11- 4- 3, Skidmore Lone Jack Oil 1 ..... Dry
30-3-3, Homer, Czarina Oil 3 ..... Dry
16-4-3, Carter, Sinclair Gulf 3 ..... Dry
29-2-3, Pruitt, Gypsy Oil 1 ..... Gas

Dry 5
Gas 3
Gas production 80,000,000

WILDCATS.

Pontotoc County—
20-4-8, Watters, Cornish et al 1 ..... Dry
11-3-5, Kreiger, Barnsdall Oil 1 ..... Dry
1-4-6, Benedum & Trees 1 ..... Dry
21-5-8, Gilmore, Plains Oil & Gas 1 ..... Dry
Okmulgee County—
24-13-17, Evans, Bassett et al 1 ..... Dry

County—
)F. Russell, Sinclair & Marland : Gas
iberg County—
R. Bascomb, Choctaw Oil : Dry
kens County—
)W. Watson, Lone Star Gas : Dry
County—
Van Doran, Topley et al : Dry
an County—
Bellele Gillette & Cowden : Dry
er County—
)W. Chambers, W. Critchlow : Dry
)W. Loughridge, Fiveside O. & G. : Dry
ware County—
)W. C. G. Wrightsman : Dry
held County—
)W. Campbell, Sharp O. & G. : Dry
iberg County
& Pears Cardinal Oil : Gas
ma County—
nW. Keyes et al : Gas
da County—
Ed Drake, Cowden Oil & Gas : Dry
ola County
L. Bunde Logan Oil & Gas : Dry
County—
)f Caldwell Watchorn et al : Dry
held County
L. Agatha Fortuna Oil : Gas
& Messner, Otter Creek Oil & Gas : Dry
taw County
A. Bowman King Boon Oil : Dry

18

production

KANSAS

SUMMARY OF COMPLETED OPERATIONS

	Comp	Prod	Dry	Gas
[illegible]	44	[illegible]	8	2
[illegible]	58	[illegible]	11	4
	[illegible]	[illegible]	15	1
	24	212	1	0
Franklin Douglas	46	[illegible]	12	1
B	13	151	4	0
[illegible]	40	[illegible]	1	0
[illegible]ato	36	434	9	2
Total	198	[illegible]	66	10

OKLAHOMA

SUMMARY OF WELLS COMPLETED

	Comp	Prod	Dry	Gas
[illegible]	91	[illegible]	12	0
[illegible]	40	[illegible]	5	2
	55	[illegible]	10	2
[illegible]	222	[illegible]	48	22
[illegible]	21	[illegible]	1	1
[illegible]	1	[illegible]	1	0
[illegible] Shawnee	10	[illegible]	2	1
[illegible]	14	[illegible]	3	0
[illegible]	41	[illegible]	2	2
[illegible]	33	95	21	4
Total	612	[illegible]	104	36

MID-CONTINENT.

SUMMARY OF COMPLETED OPERATIONS

	Comp	Prod	Dry	Gas
Oklahoma	612	[illegible]	104	36
Kansas	198	[illegible]	66	10
Arkansas	0	0	0	0
Total	810	[illegible]	170	46

TEXAS PANHANDLE.

WICHITA AND WILBARGER COUNTIES

Electra—
Waggoner, The Texas Co. 143 Dry
Smith, Empire Gas & Fuel : Dry
Fuleche, Great Western Oil : Dry
Tate, Trammel et al : Dry

Dry 4

BURKBURNETT

Roller, Whale Oil 3 Dry
Belderdack, Munts Oil : Dry
Fowler C. B. Hammond 2 Dry
Bolderdack, Donegan et al 6 Dry
Roller, Shegogg & Turner : Dry
Cropper, Texahoma Oil & Gas 21 Dry
Bentley, Stanfield et al : Dry
Daniels, Hall & Parer : Dry
Belderdack, Munz Oil 2 Dry
Van Lauterman Anderson & Bright : Dry

Dry 10

PETROLIA

Edwards Hapgood Texas & [illegible] Dry
Landon Metropolitan Oil : Dry

Dry 2

WILDCATS

Stephens County
Proctor Texas & Pacific Coal : Dry
Winston Texas & Pacific Coal : Dry
Wichita County
Love, Bunch Railroad Lease : Dry

Dry 1

NORTH LOUISIANA

Miscellaneous
[illegible] Sallinge Atlas Oil 2 Dry
[illegible] Community Atlas Oil : Dry
[illegible] State Atlas Oil & G. : Dry
[illegible] White Arkansas Nat. Gas Co. Dry
Rosser
[illegible] Caplis The Texas Co. 2 Gas

Dry 4
Gas 1

NORTH LOUISIANA

SUMMARY OF COMPLETED WORK

	Comp	Prod	Dry	Gas
Caddo	2	[illegible]	0	2
De Soto	0	0	0	0
Red River	0	0	0	0
Bossier	1		1	1
Miscell	4	0	4	0
Total	14	[illegible]	6	1

Discontent is the want of self reliance it is infirmity of will. Emerson.

GULF COAST.

DAMON MOUND.

Masterson, Texas Exploration 3 ..... Gas

GULF COAST.

SUMMARY OF COMPLETED WORK.

Dist.	Comp.	Prod.	Dry
Anse LaButte	0	0	0
Batson	0	0	0
Damon Mound	4	350	2
Edgerly	4	1,700	0
Goose Creek	17	14,200	5
Humble	27	447	11
Jennings	2	240	0
Markham	0	0	0
Spindletop	4	375	1
Saratoga	0	0	0
Sour Lake	2	0	2
Vinton	3	4,075	1
New Iberia	1	0	1
Piedras Pintas	0	0	0
Miscellaneous	21	75	17
Total	85	21,462	40

STANDARD OIL SUBSIDIARIES.

January 1st to January 20th, inclusive.

BY JO. P. CAPPEAU SONS.

		Open	High	Low	Last
£1	Anglo-American	17	17½	13	13
$100	Atlantic Ref.	925	950	875	920
100	Borne-Scrymser	450	450	430	430
50	Buckeye Pipe	96	98	93	95
100	Cheesebrough	300	300	300	300
100	Colonial	10	10	10	10
100	Continental	450	480	430	480
50	Crescent	30	32	30	32
100	Cumberland	125	125	120	125
100	Eureka	190	200	185	200
100	Galena, Com.	140	140	130	130
100	Galena, Pref.	128	133	120	120
100	Illinois Pipe	190	195	185	185
50	Indiana Pipe	95	100	93	98
12½	National Transit	12½	12½	12	12½
100	New York Transit	190	190	180	180
100	Northern Pipe	95	98	93	98
25	Ohio Oil	305	345	300	332
100	Prairie Oil	425	460	415	450
100	Prairie Pipe Line	257	260	240	250
100	Solar Refining	300	300	280	290
100	Southern Pipe	175	175	160	170
100	South Penn. Oil	290	293	270	290
100	South West Penn. Pipe	100	100	95	95
100	S. O. of California	225	235	218	233
100	S. O. of Indiana	210	650	590	630
100	S. O. of Kansas	450	470	430	460
100	S. O. of Kentucky	310	310	300	300
100	S. O. of Nebraska	480	500	475	480
100	S. O. of New Jersey	525	547	520	545
100	S. O. of New York	255	270	247	279
100	S. O. of Ohio	420	480	410	410
100	Swan & Finch	95	95	90	95
100	Union Tank	86	86	83	83
100	Vacuum Oil	350	360	330	350
10	Washington Oil	25	25	25	25
25	Penn-Mex.	40	42	35	42
5	International Pet.	13½	13½	12¾	12¾

Independent Oil Companies:

		Open	High	Low	Last
25	Pierce Oil	11	11¼	9½	9½
50	Midwest Refining	110	110	103	104
25	Tropical Oil	5	5½	5¼	5½
5	Cosden Refining	7⅞	7⅞	6¾	7
5	Sapulpa Refining	8⅞	9¾	8¼	8½
5	Cosden Oil & Gas, Pfd.	3¾	3¾	3½	3½
5	Okla. Producing & Ref.	7⅛	7¼	6¾	6⅞
5	Atlantic Petroleum	3½	3¾	3½	3½
10	Merritt Oil	21	23½	20¾	21½
1	Midwest Oil	97	115	95	115

FINANCIAL REPORT.

January 1st to January 20th, inclusive.

BY JO. P. CAPPEAU SONS.

	Sales	Open	High	Low	Last
Columbia G. & E.	820	32	34½	30¼	32
Fayette Gas	...	..	..	..	129
Mfg. L. & H.	3,007	52¼	53	51⅛	51⅛
Ohio Fuel Supply	12,935	41¾	45	41½	44
Ohio Fuel Oil	530	15½	15⅞	15½	15⅝
Oklahoma Gas	770	25	25	25	25
Pgh. Oil & Gas	300	5½	5¾	5½	5¾
Pure Oil Com.	...	..	..	..	24½
Cent. Kentucky Gas	...	..	..	..	22
Lone Star Gas	165	95	96	95	96
Union Gas	...	..	..	..	153½

There is nothing so powerful as truth,—and often nothing so strange. Webster.

AROUND THE BELT

New Wells, New Pipe Lines, New Contracts, Additions and Extensions. A Fund of Valuable News Collected for the Journal Through Many Sources

TRADE PERSONALS

It is noted that the names appearing in this department will be of extraordinary interest to the live element of the natural gas field. Those wishing to learn of matters pertaining to men interested in the field of artificial gas should refer to THE GAS INDUSTRY magazine now published at the Pearl Street Buffalo, N. Y. office. It does its work among persons entirely in artificial gas matters. That magazine is published by the same people who put out THE NATURAL GAS INDUSTRY, each magazine being conducted for its respective field. In this way each magazine is of much efficiency in the industry it serves. Publisher's Note.

[illegible] Hanna of Parker Gas Well Supply Co. has been connected with the Empire Gas & Fuel Company at Eldorado, Kan.

[illegible] Hall, formerly New Business Manager of the Wagner Gas & Power Company, Wichita, has been promoted to Sales Manager.

[illegible] Lewis, Kansas City, Vice President of the Empire Oil & Gas Company, Independence.

[illegible] Wood, of Pawhuska, Okla., Assistant Superintendent of the Northwestern [illegible] Company, has been promoted to Superintendent.

[illegible] Powers, Pipe Line Superintendent of the Empire Gas & Fuel Company, Bartlesville, Okla., has been appointed Superintendent of Production, succeeding W. [illegible].

[illegible] Jones, Assistant Manager of the Eldorado, Kan., plant of the Empire Gas & Fuel Company, has been appointed Manager of the Augusta, Kan., plant, succeeding Judge James H. Reed, who has been promoted to Superintendent of the Eldorado, Kan., plant.

[illegible] Kerr, previously Assistant Superintendent of the Bartlesville, Okla., district of the Empire Gas & Fuel Company, has been appointed Superintendent of the Augusta, Kan., district, succeeding Judge James H. Reed, who has been promoted to Superintendent of the Eldorado, Kan., district.

[illegible] Carters for Mr. [illegible] has been appointed Assistant Manager of the Augusta, Kan., district of the Empire Gas & Fuel Company, succeeding Mr. Carters, who has been promoted to Manager of the Eldorado, Kan., district.

[illegible] Manager of the Southern Division of the Northwestern [illegible] Company, has been transferred to the Northern Division, with headquarters at [illegible], succeeding W. B. [illegible], who has been promoted to Manager of the Southern Division, with headquarters at Drumright, Okla., succeeding [illegible], who has been transferred to the Northern Division, with headquarters at [illegible].

[illegible] has recently been appointed Superintendent of Production for the Empire Gas & Fuel Company at Eldorado, Kan.

DECEASED

[illegible] A. [illegible], Superintendent of the Southern Division of the Northwestern [illegible] Company, has been killed in an automobile accident.

[illegible] Manager of the Augusta, Kan., district of the Empire Gas & Fuel Company, died suddenly of heart disease.

PER CUBIC FOOT—RATES

ARKANSAS

[illegible]

KANSAS

[illegible]

OKLAHOMA

[illegible]

TEXAS

[illegible]

NEW YORK

[illegible]

A great man is made up of qualities that meet or make great occasions. Lowell

tribution and sale to the Hornell Gas Light Company and the Canisteo Gas Light Company. In all but four places the company's customers are paying 40 cents a thousand with the three cents discount.

Corning

The Crystal City Gas Company recently raised its rate schedule.

PENNSYLVANIA—Butler

The T. W. Phillips Gas & Oil Company has increased its rates from 27 cents per thousand to 30 cents per thousand.

Warren

Warren has withdrawn its suit against the Pennsylvania Gas Company in the matter of objecting against the raise in gas rates At a meeting of the borough council it was decided not to take further action in the suit brought by the cities of Warren, Erie and Corry against the gas company.

The decision was reached after data were secured showing that the gas company spent more than $500,000 last year in search of gas and intends to drill 50 more wells this year.

NEW FRANCHISES

ALABAMA—Birmingham

The Dixie Gas Company has applied to the local municipal authorities for a natural gas franchise. W. F. Aldrich is President, and Edward R. Lovewell is Secretary of the company.

ARKANSAS—Little Rock

The city has granted a natural gas franchise to the Arkansas-Louisiana Gas & Development Company of Monroe, La. The company has agreed to have its system completed within twelve months or forfeit $20,000.

OHIO—Urbana

The franchise of the Ohio Fuel & Supply Company in this city expires in March. A new franchise is being considered.

TEXAS—Dallas

The Dallas Gas Company has been granted a new service-at-cost franchise. The maximum price of gas to the consumer is fixed at 50 cents a thousand, this being the rate now in effect.

GENERAL

ALABAMA—Birmingham

It is reported that the leases of the Dixie Gas Company on the Aldrich Dome, near this city, will be actively developed during the coming spring. The program as laid out includes the laying of pipe lines and marketing of gas.

ARKANSAS—Arkansas City

The Arkansas Valley Railway Light & Power Company has employed several girls in the capacity of meter readers. If the innovation is a success the force will be enlarged.

CALIFORNIA—McKittrick

It is reported that the Pacific Light & Fuel Company is laying a gas line from the Belridge field to McKittrick in order to increase the supply. The company supplies gas for domestic and industrial needs of the city and vicinity, having formerly secured their gas from the Associated wells about McKittrick. The new line, which is nearing completion, will draw from the Belridge Oil Company's wells. The minimum price received for gas is $1.50 per 1,000 cubic feet.

Stockton

Natural gas is being used to operate a motor car owned by Pengilly & Clark, a local business house. The gas in contained in a rubber bag fastened on top of the cover of the car. The tube of the gas bag is attached to the carburetor by means of a check valve. One part gas and nine parts air is the mixture used.

DISTRICT OF COLUMBIA—Washington

A club-house has been fitted up at No. 1329 K Street, this city, for the convenience of men connected with the Doherty organization who come to Washington on business. The officers of the club are: J. C. McDowell, in general charge of Doherty natural gas and oil operations, president; H. D. Williams, Buffalo, N. Y., counsel for the Dominion Gas Company, Ltd., etc., vice-president; George Williams, manager of the new business department, chairman of the house committee, and Carl H. Henrichson, formerly of the Toledo new business department, secretary. The latter resides at the club and is responsible for its maintenance.

ILLINOIS—Chicago

The Federal Oil Company, owned exclusively by women, recently held its annual meeting. The former officers were re-elected as follows: President, Mrs. H. H. Honore; Vice-President, Mrs. Elizabeth Doyle; Treasurer, Mrs. Elmer Burgess.

INDIANA—Pike County

A . B. Bement is reported to have drilled in a 1,000,000-foot well in his test on the Jane Fettinger farm, Section 19, at a depth of 936 to 950 feet.

KANSAS—Chautauqua County

The Prairie Oil Company owns 61 producing oil wells in this county, as well as one large gasser.

Paola

Oklahoma interests have drilled in a well on the Lister farm, 13 miles northwest of here, which at a depth of 710 feet has a good showing of gas.

A large gasser is reported by the Missouri Oil & Gas Company on the Hogan farm, Section 9-17-23, at a depth of only 370 feet.

Wellsville

KENTUCKY—Louisville

LOUISIANA—Alexandria

Bossier Parish

MONTANA Great Falls

NEW YORK Buffalo

Dunkirk

OHIO Ashland County

Cincinnati

Columbus

Cuyahoga County

Most people judge men only by success or by fortune La Rochefoucauld

Doylestown

The East Ohio Gas Company has a very good well on the F. W. Galehouse farm, two miles south of this city The gas was found in the Trenton rock.

Hocking County

In the Brinkhaven development in Tiverton Township, the Logan Natural Gas Company drilled a second test on the Lewis Reece farm through the Clinton sand. This location is 800 feet east of the first test on this farm. Nothing was found in the second test but a gas pressure, with an estimated capacity of 500,000 cubic feet a day.

Holmes County

In Washington Township the Logan Gas & Fuel Company drilled in a large gasser in a test on the E. J. Lozier farm, Section 3.

Lima

In the local Common Pleas court it was ruled that the Lima Natural Gas Company is not responsible for accidents that might grow out of low gas pressure.

Medina County

In Homer Township the Ohio Fuel Supply Company drilled a very light gas well in a test on the Ella A. Fike farm, Section 35, and a fair gas well on the Fred Hardinger farm, in Medina Township.

In Lafayette Township, the Ohio Fuel Supply Company drilled a good gas well in a test on the Levi Lance farm, Section 32, and a light gas well in No. 2 on the Howard Huff farm, Section 23.

Mentor

The Lake Shore Chemical Company, owners of the Mentor Knitting Mills property, struck two gas wells at Mentor, the production of which is said to be sufficient to furnish 2,500,000 feet of gas to Painesville a day. The Chemical Company is said to be consulting with the Painesville Gas Company with a view to furnishing gas for this city.

Wayne County

In Franklin Township, the Ohio Oil Company drilled a light gas well in No. 9 on the W. P. Snyder farm, Section 23.

OKLAHOMA—Bald Hill

West of Bald Hill on the S. Colbert farm, in the east half of the northeast quarter of Section 9-14-13, French and others on the S. Colbert farm have a well giving 2,500,000 feet of gas and spraying oil in considerable quantity.

Bixby

The Magnolia Petroleum Company has a 5,500,000-foot gasser in its No. 4 on the Moore farm, in the southeast of the northwest quarter of Section 34-16-13.

Boynton

In the Boynton pool, Probst & Morrison have a 6,000,000-foot gasser in their No. 2 on the Gracie Beams farm, Section 19-14-16, at a depth of 1,670 feet. The Minnekota Oil Company, in Section 34-16-15, has a gasser which is being converted into an oil well.

Butler County

The Lucky Eight Oil & Gas Company reports a g gasser in its No. 2 on the Piper farm, Section 13-2

Gas has been struck by H. J. Parker and others their No. 2 on the W. E. Brown farm, Section 22-2

Garfield County

In the Garber district, the Oil State Petroleum C pany struck a gas sand in its No. 1 on the Barnes fa in the northwest quarter of Section 15-22-3. This v is on the Reiger anticline and is a mile and a half no west of the 4,000-foot dry hole drilled by Glenn Braden. The flow of gas found at 1,340 feet registe 10,000,000 cubic feet daily. It has been mudded in the well will be drilled deeper, the oil sand being pected at 1,500 feet or less.

The Ben Franks Oil & Gas Company, at a depth 1,340 feet in its No. 1 on the Allen farm, had 1,000, feet of gas. This well is in the southwest quarter Section 16-22-3 west. The well will be drilled deeper is producing gas at 1,220 feet.

Gas was struck by the Kanotex Oil Company sand at 1,185 feet in its test on the Haynes farm, in northwest corner of Section 9-21-3 west. The wel being cleaned out and will be drilled deeper. Jus short distance away from the Kanotex well is the of the Amber Oil Company on the Cain farm, wh got a flow of gas at 1,220 feet.

Kay County

The Cherokee Oil & Gas Company has a 5,000,0 foot gas well in its test on the Smythman farm, in west half of the southwest quarter of Section 15-2 west. The sand was found at 800 feet.

Lawton

A natural gas plant and distributing system are ing installed by the Lawton Gas & Electric Comp in this city.

Muskogee

The Prairie Oil & Gas Company is drilling on John Tiger farm, Section 15-14-7. The well will drilled to the Tucker sand, and has so far cost its o ers $100,000.

Muskogee County

Cosden & Company completed a 1,000,000-foot g ser in its No. 3 on the Reynolds farm, in Section 5-15, Haskell district. Peterson and others drilled a 000,000-foot gasser on the Asbury farm, in Sect 20-16-15.

Oklahoma City

Consumers have been objecting to the plan of Oklahoma Natural Gas Company to recover gaso from the gas before it is distributed on the ground t the quality of the gas is impaired by the process. company, to meet this situation, offered to send gas in its original state for four days, to be followed four days during which the gas delivered would without gasoline content, the gas having pas through the gasoline recovery apparatus. The city ficials, however, held to their point of asking for l oratory tests.

Philosophy is nothing but discretion. Selden.

Okmulgee

Medford and others have [illegible] gas well [illegible] the Chat James farm, in the southeast quarter of section 16-12-14. The gas comes from a sand at [illegible] feet.

In the Okmulgee-Morris district the Nile Oil Company after getting 1,500,000 feet of gas in sand at [illegible] feet in its No. 6 on the N. Alexander [illegible] feet and then [illegible] a [illegible]. It is in the northwest corner of the section.

In the Bald Hill district the Sperry Oil & Gas Company's No. 14 Grayson in the northwest of the northeast of section 21-13-14 showed [illegible] feet of gas [illegible] feet and [illegible] feet at 1,760 to feet.

Osage

In the Osage district the American Pipe Line Company has a 15-[illegible] gasser with a 12-pound [illegible] the northwest of Section 25-27-8. The [illegible] gas sand was found at [illegible] feet and the hole was [illegible] feet.

The Osage & Oklahoma Oil Company's No. 211 in the [illegible] quarter of Section [illegible] is a good [illegible] gas well. It has a sand at [illegible] feet.

The Barnsdall Oil Company on the St. John district [illegible] building. Some [illegible] No. 1.

Nowata

[illegible]

Tulsa County

[illegible]

PENNSYLVANIA—Ceres

[illegible]

Greene County

[illegible]

Cambria

[illegible]

Clay

[illegible]

Sheffield

The Interstate Gas Company reports a loss of about $15,000 when one of its gasoline plants was destroyed by fire.

Warren

It is said that the coming spring will mark the beginning of one of the greatest booms in gas and oil in the history of Northwestern Pennsylvania. The [illegible] gas in the [illegible] fields are getting [illegible] on a [illegible] that they did in 1917.

The [illegible] well in the [illegible] field, which is now drilling, will be the present year's [illegible] gas [illegible] are the Warren-McKean [illegible] Pine Forest and Jefferson.

TEXAS—Coleman County

A [illegible] gasser was completed [illegible] on the Cross ranch northeast [illegible] at a depth of [illegible] feet. The well is [illegible].

Fort Worth

It is reported that a deal has been [illegible] between the Texas & [illegible] and the Texas & Pacific [illegible] Company, in which [illegible] Eastland and Stephens counties [illegible].

[illegible]

Ranger

[illegible]

Stephens County

[illegible]

WEST VIRGINIA—Braxton County

[illegible]

Calhoun County

[illegible]

Doddridge County

[illegible]

WEST VIRGINIA

[illegible]

Fame sometimes hath created something of nothing.—Butler.

The Hope Natural Gas Company is drilling a deep test on the M. A. Goff farm, located on Owens Run, near Bridgeport, Simpson district. This well has now reached a total depth of 7,363 feet, the deepest of any in the world. An 8-inch hole was carried down to a depth of 7,260 feet and then a liner was placed and the hole reduced in size from 8 to 6-inch. It is thought there will be no trouble in reaching a depth of 8,000 feet.

The well next in depth of which there is any record is located in Silesia-Austria. The drilling was financed by the Austrian Government and the well is said to have reached a depth of 7,349 feet. The method of drilling differed from that of the Hope Gas Company. The Hope Company uses a steel cable and the Austrians used the coring and rotary method, taking out the core in sections.

Kanawha County

On Kelly's Creek, Cabin Creek district, Frank Smith's second test on the Melly B. Thompkins farm, is a gasser in the Berea grit. In the same locality, the Montgomery Oil & Gas Company got a gasser at No. 7 on the Sarah B. Watson farm. The Columbia Carbon Company completed its well on the Spruce lot, getting a gasser with a capacity of 3,500,000 cubic feet a day.

Lewis County

On Wolf Pen Run, Freeman's Creek district, the Reserve Gas Company has completed a test on the Calvin Flesher farm. It is a fair gasser in the Big Injun sand.

Marion County

In Mannington district, the Hope Natural Gas Company has drilled on the J. L. Hamilton farm and it is a fair gasser. The Carnegie Natural Gas Company has drilled its test on the Mary A. Shaw farm and is a light gasser. The Wildwood Oil Company drilled its test on the N. H. and M. Debolt farm and developed a light gas pressure.

In Mannington district, the Carter Oil Company made the location for a test on the George Robbins farm, and F. W. Bartlett is rigging up another test on the John Huey heirs farm.

Marshall County

On Big Run, Liberty district, the Manufacturers' Light & Heat Company has now drilled its test on the J. M. Rhine farm through the Big Injun sand. A fair gas pressure was developed in that formation.

On Bens Run, Liberty district, the Manufacturers' Light & Heat Company is due in the Gordon on the Samuel Ernest farm.

On Grave Creek, Cameron district, the same company's test on the J. I. Dorsey farm is a light gasser in the Gordon sand.

On Fishing Creek, Liberty district, the Carnegie Natural Gas Company has drilled No. 3 on the H. G. Fair farm into the Maxon sand, developing a very good gasser. The capacity of the well is estimated at 15,000,000 cubic feet a day.

Monongalia County

On Thomas Run, Clay district, the Manufacturers' Light & Heat Company drilled its first test on the A. Varner farm, a gasser in the top of the Big Injun sand, 15 feet deeper into that formation and it is showing for a five-barrel pumper.

Preston County

In Kingwood district, the Southern West Virginia Gas Company has started to drill a test on the Dr. Graham farm.

Roane County

In Walton district, the Lotty Oil & Gas Company has the rig completed for a test on the Robert N. Greene farm.

Wetzel County

The Philadelphia Company's No. 4 on the W. E. Higginbotham farm has been drilled through the Fourth Sand. It is a gasser in that formation.

WYOMING—Hidden Dome

According to geologists, prospects for oil and gas in this section are excellent.

Salt Creek

The casinghead gasoline plant of the Midwest Refining Company has been tested out and found satisfactory. The plant and 56-mile pipe line to Casper represents an investment of $400,000.

ALBERTA Calgary

The Calgary Petroleum Products Company, together with California capitalists is building a casinghead gasoline plant where the Petroleum Company's product from its No. 2 gasser will be utilized in the making of gasoline. The company's No 1 well in Section 6-20-2 is producing both oil and gas. The total production of gas from the two weels is estimated at about 5,000,000 cubic feet.

Edmonton

The Northern Natural Gas & Development Company has a 5,000,000-cubic foot gasser in its No. 7 well in the Viking field.

Natural Gas and Gasoline
JOURNAL

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CONTENTS OF THIS ISSUE

AROUND THE BELT—

INDEX OF PAST 1918 ISSUES

MEMBERS OF ASSOCIATION OF NATURAL GAS SUPPLY MEN

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Borden Company, Warren, Ohio
Bovaird & Seyfang Mfg Co., Bradford, Pa
Bristol Co., The, Waterbury, Conn
Broderick & Bascom Rope Co., St Louis
Bryant Heater & Mfg Co., Cleveland
Buffalo Cooperative Stove Co., Buffalo
Builders Iron Fdy., Providence
Byers, A M Co., Pittsburgh

Carnegie Steel Co., Pittsburgh
Chagrin Falls Mfg Co., Pittsburgh
Cincinnati Rubber Mfg Co., Cincinnati
Clark & Norton Mfg Co., Wellsville, N Y
Cleveland Gas Motor Co., Cleveland
Clinton Mfg Co., Pittsburgh
Columbia Gas Stove Co., Huntington, W Va
Columbian Rope Co., Auburn, N Y
Columbus Mfg & Vent'g Co., Columbus
Continental Supply Co., St Louis
Cooper C & G Co., Mt Vernon, O
Crandall Pottes Co., New York City
Cutler Hammer Mfg Co., The, Milwaukee

Davis Bournonville Co., Jersey City
Dayton Pipe Coupling Co., Dayton
Dayton U G Gas Burner & Welding Co., Pittsburgh
Dementhon Engineering Co., Dayton, O
Draeger Oxygen Apparatus Co., Pittsburgh
Dresser S M Mfg Co., Bradford, Pa

Economic Meter Co., Pittsburgh
Empire Stove Co., Hamilton, O

Fairy Stove Mfg Co., Philadelphia, Pa
Fairbanks, The Morse, Mass
Fairbanks, The Canton, O
Fink & Lindsay Co., Pittsburgh
Fuel, The Journal, Houston, Texas

Gas Apparatus Co., Palmyra, N Y
Gas Age, The, New York City
Gas Appliance Co., Cleveland
Gas Record, Chicago
Geneva Pipe Bending Co., Providence
Geneva Gas Light Co., Kenosha
German Stove Co., Erie
Gilbert Machine Works, Hanover, N Y
Goodwin B F Co., Akron, O
Gregory Supply Co., Cincinnati
Grinnell Gas Appliance Co., The, Cleveland, Ohio
Groves Gas Burner & Eng Co., Pittsburgh

Hammon Cooper Co., Pittsburgh
Hayward Co., Monroe, Ind
Hays Mfg Co., Erie
Hart Mfg Co., Cleveland
Hazard Mfg Co., Chicago
Hester C M Stove & Co., Inc., Butler, Pa
Hewitt Rubber Co., Pittsburgh
Hewitt, Thomas, Brewster Co., Hamilton, O
Hope Engineering & Supply Co., Pittsburgh

Ideal Heating Co., The, Columbus
Imperial Belting Co., Chicago, Ill
Improved Band Co., Pittsburgh
International Nickle Gas Meter Company, Providence
Iroquois Natural Gas Co., Buffalo, N Y

Jarecki Mfg Co., Erie
Jelly Water Heater Co., St Louis
Jones & Laughlin Steel Co., Pittsburg, Pa

LaBelle Iron Works, Steubenville, O
Lehmann Stoveng Co., Columbus, Ohio
Lewthan, A & Sons Rope Co., St Louis
Lorain Automatic Draft Reg Co., Cleveland
Lucey Mfg Corp., Pittsburgh

Ludlow Valve Mfg Co., Pittsburgh

Macomber & Whyte Rope Co., Chicago
Manhattan Rubber Mfg Co., Passaic, N J
Mark Mfg Co., Chicago
Mason Pressure Burner Co., Monroe, Ind
Mesh Oven Mfg Co., Newburyport, Mass
Metric Metal Works, Erie
Minneapolis Heat Reg Co., Minneapolis
Monitor Iron Wks., Quincy, Ill
Monitor Safety Iron Co., Philadelphia
Moon Mfg Co., The, Chicago
Moore, Lee C. & Co., Inc., Pittsburgh
Moore Mfg Co., Kane, Pa
Mueller H Mfg Co., Decatur, Ill

Nathan Mfg Co., New York City
National Supply Co., Pittsburgh
National Transit Pump & Mach Co., Oil City, Pa
National Tube Co., Pittsburgh
Natural Gas & Gasoline Journal, Buffalo
New Bedford Cordage Co., New York City
New York Belting & Packing Co., New York
Nye A T & Son Co., Marietta, O

Oil & Gas Journal, Tulsa, Okla
Oil City Boiler Wks., Oil City, Pa
Oil Trade Journal, New York
Oil Well Supply Co., Pittsburgh
Oswald Apparatus Co., Chicago

Parkersburg Mach Co., Parkersburg, W Va
Parkersburg Rig & Reel Co., Parkersburg, W Va
Peerless Heater Co., Pittsburgh
Pennsylvania Furnace & Stove Co., Warren, Pa
Pittsburg Meter Co., East Pittsburg
Pittsburg Reinforced Piping & Mach Co., Pittsburgh
Pittsburg Valve, Fdy & Const Co., Pittsburgh
Pittsburgh Water Htr Co., Pittsburgh
Plymouth Cordage Co., Plymouth, Mass
Pratt & Cady Co., Inc., New York, N Y
Premier Supply Co., Massillon, O

Reading Stove Wks Co., Reading, Pa
Reed Valve Pump Co., Canton, Ohio
Reliance Stove Co., Cleveland
Republic Iron & Steel Co., Youngstown, O
Revere Rubber Co., Chelsea, Mass
Rome Mfg Co., Ltd., Mercer, Pa
Rowlands Mfg Co., Ltd., Franklin, Pa
Russell T H & Co., Oil City, Pa
Rutenber Motor & Mach Co., Coffeyville, Kansas

Sanitary Tube & Supply Co., Trenton, N J
Schaefer & Budenberg Mfg Co., Pittsburgh
Schmidt Heater Co., The, Cleveland, Ohio
Scott Co., Cincinnati, O
Siegel Light Co., New York City
Smith Corner Tube Co., Inc., Erie, Pa
Spang Chalfant & Co., Pittsburgh
Sprague Meter Co., Bridgeport, Conn
Stevens Gas Iron Co., Philadelphia
Superior Gas Engine Co., Springfield, O

Tate Jones & Co., Inc., Pittsburgh
Taylor W P Co., Buffalo
Toledo Pipe Threading Mach Co., Toledo, O
Trump Mfg Co., Pittsburgh

United Steel Co., Columbus
Utica Valve & Packing Co., Utica, N Y

Watson Co., Jamestown, N Y
Westinghouse Meter Co., Pittsburgh
Westinghouse Electric & Mfg Co., Pittsburgh
Wheeling Steel & Iron Co., Wheeling
White Tractor Co., Oil City, Pa
Worthington Pump & Mach Corp., Buffalo
Wright Wire Co., Worcester, Mass

Youngstown Sheet & Tube Co., Youngstown, O

ANNUAL CONVENTION NATURAL GAS ASSOCIATION OF AMERICA AND ANNUAL CONVENTION ASSOCIATION OF NATURAL GAS SUPPLY MEN- MAY 21 AND 22 AT PITTSBURGH, PA

THE ASSOCIATION OF NATURAL GAS SUPPLY MEN

PITTSBURGH, PA.,

Feb. 18, 1918.

Natural Gas and Gasoline Journal,
Buffalo, N. Y.

Gentlemen:-

As you are no doubt aware, the Directors of the Natural Gas Association have decided to change the place of meeting of their Association to Pittsburgh, Pa., and also have requested that we eliminate the exhibit feature this year, due to the abnormal conditions which we are undergoing at the present time.

Your directors were more than glad to concede to this request, and so this year we will all meet in Pittsburgh wiihout the exhibit feature. The convention will last only two days, and our Association will probably give a luncheon, or something of the sort to the visiting delegates.

Yours very truly,

(Signed) *Larmour Adams*

Secretary.

FROM THE EDITORIAL MAIL BAG

SUMMER AND WINTER GAS

The Problem of Summer Quantity Sold, Discussed in Gas-Man's Letter

As a result of the question arising how may a gas company in the natural gas business keep its summer sales up to winter standard, we received a letter of inquiry from Mr. George C. Reynolds, President of the Consumers Gas Company, [illegible], N. Y., which company has plants also at [illegible], N. Y., and Montour Falls, N. Y.

Our readers will be interested to note what Mr. Reynolds has to say, and we direct especial attention to the closing lines of his letter. There he solicits [illegible] from other gas men.

Mr. Reynolds' situation is no doubt the same as that of many others; therefore his question and any answers that may be received by the Editor of The Natural Gas [illegible] will prove of interest and [illegible] to others in the field.

Consumers Natural Gas Company

[illegible], N. Y., [illegible]

[illegible]

[illegible], N. Y.

Gentlemen:

One of the great problems in the natural gas business [illegible] in winter.

[illegible] manufacturers [illegible] because of the [illegible]

Another objection is that [illegible] the spring and fall we have unseasonable weather resulting in shortage of gas [illegible] the manufacturers who have been temporarily connected and [illegible] to all the domestic consumers.

Calendar months and warm weather [illegible] correspond [illegible] the majority of gas companies that have [illegible] manufacturing plants during certain months of the year and thereby have given [illegible] service especially in spring and fall.

After a considerable study of these problems we have come to the conclusion that the best policy for a natural gas company is to own some kind of a manufacturing plant with the following features: (a) such plant must be one that will not be injured by temporary shutdowns; (b) it ought to be one in which very little labor is employed, so that the gas superintendent and employees can do most of the work; (c) it should be one in which fuel is the most essential feature of the business.

It is easier to describe the nature of plant in which to periodically use natural gas as above described than it is to find such an ideal business. Some of the gas companies in this country may have solved these problems satisfactorily. We should like to find out what the best solution is.

Questions relating to the natural gas business are frequently answered in your magazine and I [illegible] subscribers to answer [illegible] questions [illegible] their experience.

Assuring you of our gratitude for any suggestions [illegible], I am,

Very respectfully yours,

CONSUMERS NATURAL GAS CO.

[illegible] Reynolds, President

SHIPYARD VOLUNTEERS

T[illegible] the neigh[illegible] skilled [illegible] regarding this [illegible] Mr. [illegible] at Washington [illegible]

[illegible]

A thought is often original, though you have uttered it a hundred times. Holmes

Those who are selected will be taken upon the basis of their qualifications, and will be assigned in accordance therewith.

The government requires the ships to get supplies to our men and our allies on the other side of the Atlantic. This is a needed service and every man who enters it will be recognized as doing "his part," equally with the men who are on the other side waiting to be served by the ships that these men will provide.

GAS, VERSUS CAR-DELIVERIES.

What Would Have Happened This Winter Had There Been No Gas, in View of the Car Shortage.

ONE of the daily newspapers of Columbus, Ohio, published an interesting statement, and it was surely a clever piece of business to thus put the matter before the gas consumers of that Ohio city. The article read as follows:

"On one day this month more than 3,000 tons of coal substitute was delivered to the homes of Columbus, without fuss or confusion. This substitute coal did not interfere with the shipment of war necessities by tying up even one railroad car or one delivery wagon. It was delivered right into the homes of Columbus, without effort on the part of the people receiving it. Of course it has taken an investment of millions of dollars in compressing stations, pipe lines and other equipment, to make this possible, but then that is another story.

"I wonder if the people of Columbus fully appreciate the value of the remarkably low-priced fuel which has for years been ready for their use by simply turning a valve? I refer to natural gas. It is hard to grasp what gas has meant to the city of Columbus and the whole State of Ohio. We hear so much about the great efforts to bring forward the coal supply that we may lose track of the fact that the gas companies have been delivering millions of cubic feet more gas this winter than ever before, to fill the need where the coal supply has been insufficient.

"In conversation with a number of gas men today I find that on that one Saturday, when the blizzard was with us, and the thermometer hitting 12 below, the local gas companies delivered about 65,000,000 cubic feet of gas to the homes of Columbus. These men figured out the fact that this amount of fuel represented, in heat value, more than 187 carloads of coal, which would require four trains of 46 cars of 35,000 pounds capacity.

"These same men state that an average of almost 50,000,000 cubic feet of gas a day was served to the people of Columbus, all during this cold spell. Taking the proven B. T. U. values of run of mine coal and natural gas as a comparison, it is no exaggeration to say that the gas served to the homes of Columbus was equal to one ton and a half of coal delivered each month to every house and place of business in the city. Think of the tie-up in railroad and delivery service there might have been if we had not had the gas service which the gas companies have given us!

"Columbus has many things to boast about, and when it comes to getting folks to locate in Ohio, we should not forget to tell about natural gas service."

DOHERTY SYNDICATE OPERATES FROST GAS COMPANY.

THE Henry L. Doherty interests, located in Buffalo, N. Y., are seeking a transfer of the franchises, as well as the properties, known as the South Shore Natural Gas & Fuel Co., the Silver Creek Gas & Improvement Co., Fredonia Natural Gas Co., the Attica Natural Gas Co., the Ontario Gas Co., North Buffalo Natural Gas Fuel Co. and the Niagara Light, Heat & Power Co.

In January 1917 the stock of the South Shore Natural Gas & Fuel Company, the Silver Creek Gas & Improvement Company, and the Fredonia Natural Gas Light Company, was acquired by the Frost Gas Company.

These companies supply 11,317 consumers with a pipe line and distribution system of approximately 438 miles in length. They supply with natural gas for fuel, lighting and power Dunkirk, Fredonia, Westfield, Silver Creek and Mayville. The gas is obtained as far east as approximately twenty miles west of Buffalo and in the vicinity of Farnham. The North Buffalo Natural Gas Fuel Co. supplies natural gas for domestic consumption in the northerly part of Buffalo and the Niagara Light, Heat & Power Co. supplies manufactured gas in Tonawanda. The Niagara company is about to supply by-product gas in Tonawanda and North Tonawanda and will be required to make a large investment in pipe lines, apparatus and holders. It also supplies gas to Kenmore, ten miles east of which is the westerly end of the Alden-Batavia Natural Gas Co.'s pipe line and distribution system. The Alden-Batavia Natural Gas Co. and the Akron Natural Gas Co. are operated as one system, supplying 7,423 customers in Erie, Genesee, Wyoming, Monroe, Livingston and Ontario counties. The natural gas is obtained locally.

The following corporations are of New York state and all of them are operated from the Doherty offices in Buffalo.

In New York state the following companies are operated from the office in Buffalo: Alden-Batavia Natural Gas Co. Ltd., Akron Natural Gas Co. Ltd., Attica Natural Gas Co. Ltd., Ontario Gas Company, Ltd., North Buffalo Natural Gas Fuel Co., South Shore Natural Gas & Fuel Co., Silver Creek Gas & Improvement Co., Frost Gas Co. and Brocton Gas & Fuel Co.

The officers are as follows: F. M. Lowry, general manager; H. R. Davis, general superintendent; J. A. Richie, secretary-treasurer, while the Niagara Light & Power Co. is operated from Tonawanda with C. W. Wallace, general manager; H. W. Beckett, secretary-treasurer; E. H. Beam, new business manager.

Remember this,—that very little is needed to make a happy life.—Aurelius.

Questions and Answers

Prize Winning Paper in Contest Offered by Natural Gas Supply Men's Association.

THE

CASH PRIZE CONTEST

Question

Answer

Question

Answer

Question

Answer

Question

Answer

Question

Answer

Question

Answer

Question

Answer

Good company and good discourse are the very sinews of virtue Walton

carried to the bottom of the well by means of a pipe inside the tubing. The steam will completely dissolve the salt.

Question: How would you start packer in gas well where rubber is vulcanized to rock?

Answer: A practical way to start a packer vulcanized to the rock is to jar it loose by working the tubing up and down, which will eventually loosen it. This working up and down wears away the rubber so that the packer will pass the "ring bone" which is a slight shoulder or close place in the wall. The "ring bone," or the close place, in the way is the cause of the packer sticking.

Question: What is the largest size tap which it is practical to make in 2-in., 4-in., 6-in. and 8-in. line pipe?

Answer: The largest size tap it is practical to make in a 2-in., 4-in., 6-in. and 8-in. pipe without flattening the pipe so as to form a shoulder or corking after screwing in the connecting pipe, is as follows:

One-half inch tap in two-inch pipe.
One and a quarter inch tap in four-inch pipe.
Two inch tap in six-inch pipe.
Two and a half inch tap in eight-inch pipe.

Question: What are the chief constituents of natural gas and approximately what percentage of each?

Answer: Natural gas usually composed of the following gases:

$C.H_4$ (Marsh Gas), about 92 per cent.
C_2H_6 (Ethane), about 3 per cent.
H (Hydrogen), about 2 per cent.
N (Nitrogen), about 3 per cent.

The constituents of natural gas vary greatly—according to the locality—and the above composition is only approximate for most natural gases.

Question: In your opinion, which is the proper place to tap a line for the service—on the side, top or bottom?

Answer: The top is the best place to tap a main for a service on account of the following reasons:

1. To aid in keeping dirt out of the service, as dirt has a tendency to move to the low places.
2. By means of two ells the service can be swung from the main at any angle.
3. The danger of the service being broken off is lessened.
4. The tendency of having a strain put on the connection is lessened.

Question: Which has the most heat units per cubic foot, natural or artificial gas?

Answer: Natural gas has approximately twice the number of heat units per cubic foot that artificial gas has.

Question: What is the approximate value of the natural gas sold in the United States?

Answer: The amount of natural gas utilized in the United States during the year of 1916 amounted to approximately 700,000,000 cubic feet with a value of $5,560,000,000.

Question: What methods should be adopted for determining the efficiency of the line walkers?

Answer: The question of determining the efficiency of line walker depends on whether the line walker is covering field or trunk lines.

In fields where more than one line walker is employed, a simple way is to assign a different man to certain lines each time, so that no line walker knows what his work will be the next day.

On trunk or main lines, a good check on the efficiency of a line walker is by means of a portable clock, which the line walker carries. This clock is sealed and contains a weekly or monthly chart, giving date and time. The charts are changed and the clocks sealed at the main office, or by the man having charge of line walkers. Any number of distinct and different keys, no two alike, for punching the chart in the clock on the hour, quarter or half hour as desired, may be made. The keys are fixed in position so that line walker cannot fool with them or carry them around. The keys are to be located in such positions so that it would also be a necessity for the line walker to cover his beat in order to punch the chart, which gives a record of the date and time he was at the place. The chart will tell if the line walker has covered his beat—but will not tell if he is reporting all matters that he should. However, if he does not report all matters that fault will soon come to light.

Question: How can gas wells not in service be best prevented from drowning out?

Answer: Gas wells not in service can best be prevented from drowning out by means of a pumping outfit, or a syphon pipe, and then giving the well proper attention.

Question: How much more capacity has a twelve-inch line than a four-inch line twenty miles in length, both with two hundred pounds initial and forty pounds discharge pressure?

Answer: The carrying capacity of 4-inch line, 20 miles in length, with initial pressure of 200 lbs. and a discharge pressure is

$$Q = 42\ a.\ \sqrt{\frac{P_1^2 - P_2^2}{L}}$$

$$= 42 \times 34.10 \sqrt{\frac{214.7^2 - 54.72^2}{20}}$$

$Q = 66483$ cu. ft. per hour.

The carrying capacity of lines for same conditions vary as the 2.542 power of their diameter.

Therefore, $4^{2.542} : 12 : 12^{2.542} :: 66483 : X$

X=discharge of 12″=1,085,297 cu. ft. per hour.

By use of above formula, the discharge of the 12″ line is 1,084,096 cu. ft. per hour.

Therefore, the 12″ line has a capacity of $\frac{(1{,}084{,}096)}{(66483)}$ 1630 per cent. more than the capacity of the 4-inch line.

The appearance of things to the mind is the standard of action to man.—Epictetus.

Question: How much more capacity has an eight-inch line twenty miles in length with discharge pressure of forty pounds when initial pressure is raised from one hundred pounds to three hundred?

Answer: When size of pipe is 8-inch, length 20 miles, initial pressure 100 lbs. and discharge pressure 40 lbs.

$$\text{The discharge}=Q=42\ a.\sqrt{\frac{P_1^2\ P_2^2}{20}}$$

$$Q=42x198\sqrt{\frac{115^2-55^2}{20}}$$

$$Q=8316x\frac{13225-3025}{20}$$

$$=8316x\frac{10200}{20}$$

$$=8316x22.5$$

$$=187154 \text{ cu. ft. per hr.}$$

When initial pressure is raised to 300 lbs. and the discharge remains 40 lbs. with other conditions the same, the formula substitution becomes

$$Q=42x198\sqrt{\frac{315^2-55^2}{20}}$$

$$=8316x69.3$$

$$=576{,}698 \text{ cubic feet per hour.}$$

Thus percentage increase in the capacity of the line by increasing the initial pressure from 100 lbs. to 300 lbs. is $\frac{(576698)}{(187154)}$ or 308.0 per cent.

Question: Assuming that a line has a certain amount of leakage, quantity unknown, and the pressure of this line was reduced one-half, would the leakage be reduced one-half—or would the leakage be reduced more or less than one-half?

Answer: Because the pressure on the leaky line is reduced one-half, the leakage would not be reduced one-half, nor would it be reduced less than half. The reason for that being that discharge varies directly as the square root of the drop in pressure.

Question: Assuming a line one mile long, with initial pressure of 100 pounds and terminal pressure of 95 pounds. If the pressure at both points is reduced one-half, would the carrying capacity be reduced one-half?

Answer: Assuming a line a mile long, with initial pressure of 100 pounds and a terminal pressure of 95 pounds, the reducing of the pressure one-half at each end, would not reduce the carrying capacity exactly one half, but would reduce the carrying capacity about 48 per cent.

Question: What size meter is desirable in an ordinary eight-room house where gas is to be used for heating, lighting, cooking and other domestic purposes? Give reasons why, showing how the maximum consumption would compare with the maximum capacity of the meter.

Answer: A meter with capacity of 300 cubic feet per hour is usually used in the ordinary eight-room house.

Ordinarily in an eight-room house there would be approximately:

Seven heating stoves, with maximum consumption of 150 cu. ft. per hour.

One cooking stove, with maximum consumption of 20 cu. ft. per hour.

Thirty Welsbach mantle lights, with maximum consumption of 90 cu. ft. per hour.

One hot water heater, with maximum consumption of 10 cu. ft. per hour.

Total maximum consumption, 270 cu. ft. per hour.

The maximum consumption would rarely exceed 70 per cent. of a 300 cubic feet per hour meter, and the most of the time it rarely exceeds forty per cent. of the capacity of meter. Such variation in the loads of domestic meters are allowable, as a small positive meter will measure all volumes of gas within its capacity correctly.

DENVER BARS FAKE OIL STOCK SALES.

City Council Passes Ordinance Providing Fine and Jail Sentence for Promoters or Advertisers Making False Statements.

VIGILANCE Committees and Better Business Bureaus will be interested in legislation enacted in Denver to check the wave of fraudulent stock promotion schemes, chiefly oil, which are prevalent there.

Briefly, the Denver Ordinance forbids the sale of any "Fictitious, fraudulent, fake or spurious stocks" or to make misleading statements concerning the character, title or value of the property of any corporation or association when selling or offering for sale stock of such corporation or association."

It provides for the issuance of license fees of $300 for all stock exchanges and $10 for all stock brokers, the licenses to be issued by the Manager of Safety and Excise when satisfactory statements are made as to the character of the persons comprising the exchanges or brokerage firms. The Manager of Safety and Excise has the power to revoke licenses, and it is required that the city, in addition to stopping the sale or fake securities must advertise the facts in such cases. If a newspaper or other advertising medium accepts advertisements of fraudulent securities after such a condemnation the advertising medium will be guilty under the law.

The penalties provided are a fine of from $10 to $300 to which may be added from 5 to 90 days imprisonment.

This is believed to be the most drastic and sweeping law adopted by any American city to rid itself of the pest of fake stock peddlers.. Vigilance Committees and Better Business Bureaus in other parts of the country which are interested should write the Denver city clerk for copies of the Ordinance.

Work for safety means safety in work. The Commonwealther.

GASOLINE FROM NATURAL GAS.

SCIENTIFIC RECOVERY METHODS EMPLOYED.

BY H. A. FISHER.

THERE is no part of the oil and gas business that requires more and receives less scientific treatment than the manufacture of gasoline from Natural Gas. The refining of oil from crude to vasaline, paraffine, etc., is comparatively simple, easily understood and its problems have been worked out until there is 100% efficiency in every part of the work.

The manufacture of gasoline from natural gas is a new business. Because a quantity of gasoline could be produced with the crudest of apparatus the conclusion was "jumped at," that any old machinery or any kind of appliances were "good enough" for a gasoline plant. Assuming this the man who had a quantity of gas "guessed" it would make gasoline and put in a plant. If it failed he took the oil man's remedy of "cussing it out" and let it go at that. If he succeeded in getting some gasoline he was satisfied and never knew whether he was getting the amount he should or not.

That the average efficiency was far too low is shown by actual tests made by the writer of many plants in operation.

A small gasoline plant was making an average of 60 gallons per day. A test of the gas showed that he should get more. A change was made at the expense of not over $15.00 and the average production was 110 gallons per day.

Another gasoline plant was using 180,000 feet of gas and getting 75 gallon per day. It was 2½ gallon gas and his production should have been 350 gallons.

A gasoline plant was using 500,000 feet of gas per day and getting 500 gallons of gasoline. An inexpensive change in the appliances would have given a normal production which would have been 1250 gallons per day.

These are not unusual instances; they are typical cases and can be duplicated in scores of plants, in the Pennsylvanian and West Virginian fields. It undoubtedly is a fact that no owner of a gasoline plant can be sure that he is getting the results he should unless he has had his gas tested and his plant examined and tested scientifically through a term of months.

In explanation of the difficulties confronting the gasoline engineers allow me to cite a few instances that actually occurred in different plants.

The temperature of the gas as it was leaving the cooling coils was 60°, it was reduced to 58°—56°—54°, each change resulting in reduced production and it was necessary to come back to 58° at the best.

A plant using cooling water with a temperature of 54 changed the cooling system and increased the production 25%.

A release valve in a discharge gasoline line was moved from one end to the other of the line (over 100 feet), no other change was made but there was an increase in the production of 50 gallons per day.

In another plant the temperature of the cooling coils was reduced from 50° to 20° with 20% increase in the production.

Instances like these could be given almost without limit, but these will emphasize our claim that there is no part of the oil and gas business as intricate or requiring more scientific knowledge as the manufacture of gasoline from natural gas.

WATER REGULATOR.

Our illustration shows a water regulator for controlling water level in boilers. It serves as a safety device for keeping the proper amount of water in boilers, thus preventing accidents and saving costs for repairs. It also saves fuel, as the water is admitted in the same proportion that it is used, with a slight variation. This regulator has been tried out for two years, feeding two boilers

NEW WATER REGULATOR FOR GAS AND OIL FIELD WORK.

and sometimes three, and is said to have given entire satisfaction. There has been no cost for repairs. The only parts needing replacements would be valve seats, which would be a slight cost. Can be made for high or low pressure work, and is a great thing for use in gas and oil field work. It is patented by William H. Minekime, Water Valley, N. Y.

ABSORBING SUBSIDIARIES.

WORD has come to us that the Ohio Cities Gas Company is making material changes in connection with its subsidiaries, the plan being to take them over in fee. The subsidiaries referred to are, it is said, controlled by ownership of stock. The statement reads:—

"With the completion of plans now well advanced the Ohio Cities Gas Co. will hold in fee, and not through stock ownership, all of its ramified properties with the exception of those distributing natural gas. Although the name does not indicate it the Ohio Cities Gas Co. is a large oil producer. It has 2,700 wells in operation and produces 12,000 barrels a day. It is in the oil fields that it is making such big strides as an independent. That is why the stock of the Ohio Cities Gas Co. moves with other oil stocks."

Slight not what's near though aiming at what's far.—Euripides.

The Analysis of Gases

Methods of Analysis

BY PROFESSORS W. H. ELLIS, J. W. BAIN AND E. G. R. ARDAGH,
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Bureau of Mines, Ontario, Canada.

THE results of investigation have shown that the ordinary methods must be modified when applied to the examination of natural gas, and these conclusions have formed the basis of the present study.

Carbon dioxide was determined in the usual manner by absorption in potassium hydroxide solution.

Oxygen. Burrell and Seibert[1] have shown that alkaline pyrogallate is unsuitable for this determination and that phosphorus is also unreliable in the presence of large amounts of ethane and its higher homologues. In all the samples examined the ethane is comparatively low, and the higher members are present only in very small amounts so that no objection to the use of phosphorus could be raised on this ground. The usual form of phosphorus pipette was accordingly used, and nothing abnormal was observed during the investigation.

Carbon monoxide and olefine hydrocarbons: These have not been detected in the numerous samples analyzed by Burrell and Seibert[2], and accordingly our gases were first examined qualitatively with the aid of a dilute solution of palladium chloride[3]. About 100 c.c. of the gas was transferred to a glass holder and shaken with 5 c.c. of palladium chloride solution (0.5 g. $PdCl_2$ pe r100 c.c.); after standing for at least one hour, a sooty scum could be observed if these gases were present. To test the delicacy of this reaction, 0.3 c.c. ethylene was introduced into the gas holder with the palladium chloride solution, the color of the latter changed immediately and in 5 minutes a sooty scum appeared. With 0.1 c.c. of ethylene the action took place more slowly; 0.5 c.c. of illuminating gas gave a reaction practically immediately.

Hydrogen: Palladium black[4] heated to 100°C. was employed for the detection of this constituent, and its presence could not be determined with certainty in any of the samples.

Paraffin hydrocarbons: These were determined by the slow combustion method in a sample from which the carbon dioxide and oxygen had been removed and in which the absence of carbon monoxide, the olefine hydrocarbons and hydrogen had been proved by the methods just described. One hundred c.c. of oxygen were first passed into the pipette and about 25 c.c. of the sample was slowly admitted while the spiral of platinum wire was maintained at bright red heat. In order to assure the completeness of the combustion, the mixture was passed into and out of the pipette twenty-five times, and the total contraction was then noted. The carbon dioxide was absorbed as usual and the results were calculated on the assumption that methane and ethane only were present.

Hydrogen sulphide was determined by Tutwiler's method.[5] Harding and Johnson[6] show that this method invariably yields much too high results with coal gas, due no doubt to the presence of substances other than hydrogen sulphide which are acted upon by free iodine. In the case of natural gases, however, consisting practically entirely of paraffin hydrocarbons, such errors would not be encountered.

The burettes and pipettes were of the Hempel form. The burettes were of 100 c.c. capacity divided to 1/5 c.c. and water jacketed. For the determination of carbon dioxide and oxygen, water was used as the confining liquid, while mercury served for the combustions. The analyses were carried out in a room where the temperature was kept as close as possible to 20°C.

Apparatus Employed.

Several forms of the slow combustion pipette were tried which did not differ materially from the form recommended by Dennis.[1] It was found distinctly advantageous to introduce the two leads in the manner shown in the sketch. When the two leads were introduced separately through a double bored rubber stopper, it was difficult to make a gas-tight joint, and the effort to force the stopper home tightly resulted frequently in an objectionable distortion of the spiral. The latter was made of No. 32 platinum wire with about 20 turns of about 1 mm. diameter.

Detailed Method of Analysis.

The constituents for which tests were made and which were determined when present in the samples of natural gas examined are (1) Hydrogen sulphide, (2) Unsaturated hydrocarbons, (3) Carbon monoxide,

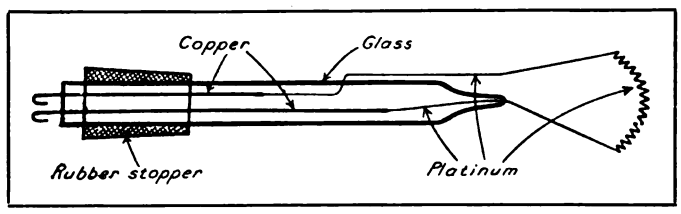
[1] Loc. Cit., 87.
[2] Loc. cit., 76.
[3] Loc. cit., 80; Phillips, F. C., Amer. Chem. Journ., Vol. XMI, 1894, p. 267.
[4] Dennis, "Gas Analysis," Macmillan, 1913, p. 188.
[5] Jour. Amer. Chem. Soc., Vol. XXIII (1901), pp. 173-7.
[6] Harding and Johnson, 8th Internat. Cong. App. Chem., 1912, Vol. XXV, p. 673.
[1] Dennis, loc. cit., p. 148.

(4) Hydrogen, (5) Carbon dioxide, (6) Oxygen, (7) Methane, (8) Ethane, (9) Propane.

For hydrogen sulphide a qualitative test was made with lead acetate paper at each gas well. When lead-paper was not blackened at the well, the quantitative estimation with iodine was, of course, omitted.

The following description sets forth in detail the procedure for gases on which all determinations were carried out:

Hydrogen sulphide was the first constituent determined; the sample collected in the glass holder being employed for this purpose. One hundred cubic centimetres of gas were drawn into Tutwiler's apparatus[2], mercury being used as confining liquid, about 5 c.c. of freshly-prepared starch solution were then sucked in, and standard iodine solution[3] (One litre contained 1.134 grams iodine. 1 c.c.=0.1 c.c. of hydrogen sulphide at 0° C. and 760 mm.) added a little at a time, shaking vigorously between each addition, until a standard blue color resulted Some time before the



APPARATUS FOR GAS ANALYSIS.

end-point was reached, a purplish-pink color developed, reminding one strongly of the titration of hydrogen sulphide obtained from pig iron by the evolution method. It is a rather interesting fact that after all the hydrogen sulphide had been oxydized by the iodine, some of these gases still possessed a sickening stench far more disagreeable than hydrogen sulphide and not at all like it. This odor may possibly be due to traces of mercaptans.

The gas-sample in which the hydrogen sulphide had been estimated, was then examined qualitatively for unsaturated hydrocarbons and carbon monoxide by shaking it with palladious chloride ($PdCl_2$) solution. The test was made by sucking about 5 c.c. of 0.5% palladious chloride solution into a small glass sampling tube of about 150 c.c. capacity, evacuating the same by means of a water pump, introducing the sample of gas to be tested, shaking vigorously for perhaps a minute and allowing to stand for some time. In not a single instance did any reducing action on the palladious chloride take place, even in cases where the gas samples were left for a whole day in contact with the reagent.

To determine the hydrogen, a sample of the gas, freed from hydrogen sulphide and saturated with water vapor, was mixed with oxygen and passed through a tube containing palladium-black heated in a boiling water-bath[1]. In every case the result was negative, or so nearly so as to be within the limits of error for the method.

To determine the carbon dioxide, 100 c.c. of the gas from which the hydrogen sulphide had been removed by shaking with a solution of lead acetate in distilled water slightly acid with acetic acid, were taken in a water-jacketed Hempel gas burette, water being used as confining liquid, and the carbon dioxide absorbed by potassium hydroxide (one of potassium hydroxide to two of water) in a Hempel gas pipette containing several rolls of iron wire gauze. The gas was passed back and forth into the pipette ten times to make perfectly certain of complete absorption; only, however, when the caustic potash was nearly exhausted did any further contraction take place after the gas had been passed twice into the pipette. The temperature of the water in the jacket was kept within 0.5° of 20°C. Before taking the reading, the burette was allowed to drain for two and one-half minutes.

After measuring the contraction due to absorption of the carbon dioxide, the gas was passed into the phosphorus pipette to remoxe oxygen. The use of phosphorus gave a very valuable qualitative (as well as quantitative) test for oxygen, since less than 0.1 c.c. of oxygen in 100 c.c. of gas will give a noticeable white fume. The pipette was filled completely with slender sticks of phosphorus. The few instances in which oxygen was found in small amounts probably indicate slight contamination of the samples with air.

After the removal of oxygen, the gas was passed into a water pipette from which samples could be conveniently taken for the estimation of the saturated hydrocarbons. The latter were determined by the method of slow combustion described by Dennis[2]. The confining liquid used both in the combustion pipette and in the gas-burette employed in connection therewith was mercury, water having too great a solvent action on carbon dioxide. The burette was water jacketed, and the temperature of the water was kept within at least half a degree of 20°C.

About 100 c.c. of oxygen were carefully measured and passed into the combustion pipette, then about 25 c.c. of residual gas were taken from the storage pipette, and its volume accurately read. The capillary connecting the burette and pipette was next cautiously freed from mercury and water, if any, the 110 volt current switched on, and the platinum spiral in the pipette brought to bright redness by cautiously manipulating a simple "nichrome" rheostat placed in series with a lamp resistance. The gas was now allowed to flow into the combustion pipette at the rate of about 10 c.c. per minute, the flow being controlled by a screw pinch-cock. The rate of flow permissible depends, however, very largely upon the form, size, position and temperature of the spiral, and possibly upon the shape of the pipette, also. Combustion took place perfectly quietly. Great care must be taken to avoid shooting a single particle of mercury into the combustion pipette, since a drop striking the white hot wire will cut it like a knife. When all the sample had been run in, the gas was run backwards and forwards between the combustion pipette and the burette about fifteen times, not

[2] Jour. Amer. Chem. Soc., Vol. XXIII (1901), pp. 173-7.
[3] Hempel, "Gas Analysis," 1902 edition, pp. 237, 303.
[1] Dennis, loc. cit., p. 196.
[2] Dennis, loc. cit., pp. 147-154.

To be conscious that you are ignorant is a great step to knowledge. Disraeli.

A creative economy is the fuel of magnificence Emerson

to gasify and was then measured. The non-condensable portion was again liquefied, and a second small condensate was thus obtained.

The entire fraction condensed was then analyzed by the slow combustion method, and in some instances the non-condensable portion also.

Circumstances would not permit the application of this method to all the samples taken, so that those which were high in ethane, as determined by a combustion on the whole sample, were selected. It is obvious that the presence of propane or butane or both in any gas, would lead, in the ordinary combustion method, to the conclusion that the amount of ethane present was higher than the real value, and hence those samples which were highest in ethane were examined first.

	Ethane by combustion on whole sample.	Ethane, propane, etc., by liquefaction.
Kent No. 2	10.8%	10.6%
Lambton No. 1	17.6%	11.6%
Lambton No. 2	18.4%	9.1%
Brant No. 1	9.5%	7.8%
Brant No. 2	19.0%	14.7%
Haldimand No. 2	11.4%	10.8%
Haldimand No. 7	16.3%	10.8%
Welland No. 1	17.3%	15.6%
Haldimand No. 1	21.3%	17.6%

It is unnecessary to give the details of the analysis of each of these condensates, but it will suffice to quote one for illustration.

In the case of Brant No. 2 the condensate yielded the following results:

	Sample No. 1.	Sample No. 2.
Volume of gas taken	14.4	15.0
Volume of oxygen added	98.8	99.9
Total volume	113.2	114.9
Contraction	78.7	78.3
Volume after potassium hydroxide absorption	51.7	50.1
Volume of carbon dioxide	27.0	28.2
Ethane	12.60	12.75
Methane	0.98	1.80

In all the condensates analyzed only methane and ethane could be found, with the exception of Brant No. 1, Lambton 1 and 2, and Haldimand 1. Butane appears to be entirely absent in these gases.

Reverting to Brant No. 2, the above data furnish two concordant values, 12.60 and 12.75 per cent. of ethane in the gas, but these figures are much lower than 19.0, the percentage determined by combustion on the entire sample without liquefaction. A comparison of the values set down in the table shows that this is also the case in Lambton No. 1 and Haldimand No. 7, and we have endeavored to find some reason for these discrepancies. The condensations were usually carried out in duplicate and when some experience had been obtained, the volumes of condensate from two samples of the same gas did not vary by more than 1 c.c. on a 100 c.c. portion. A series of determinations were carried out on Welland No. 1 which was one of the first gases examined by this method, with the object of studying this difficulty; but no higher value for the condensate than that which is given above could be obtained.

The only explanation which we can offer to account for these variations is the well known fact that the vapor pressure of a liquid is altered by the addition of a second liquid; we have as yet no reliable method of calculating the amount of the change. The magnitude may be guessed from an observation that at —78°C the vapor pressure of liquid isobutane is raised from 12.7 mm. to 19.9 mm. by the presence of 0.9% of propane[1]. While, therefore, pure ethane may at the temperature of liquid air have a vapor pressure of practically zero, the presence of a large quantity of liquid methane which is slowly being removed at each stroke of the pump, will almost certainly result in the evaporation of some of the liquid ethane also. It may at once be said that this error in parallel experiments might be expected to show a uniformity, and we have tried with the greatest care to realize this prediction but without success.

In several cases the non-condensable gases were also analyzed and proved to be mixtures of much methane and some nitrogen with small amounts of ethane. The quantity of the latter when added to that obtained from the condensate was still too low as compared with the value for ethane obtained by direct combustion.

Lack of time has prevented us from making a more thorough study of this problem.

The reason for the variations referred to above still remains undiscovered and the results actually obtained are given as a basis for the conclusions which have been drawn.

The data obtained by the liquefaction method, showing the absence of butane and higher homologues and the presence of propane in very small amount in only four samples, are taken by us to indicate the substantial accuracy of the combustion analyses. Any error which might be due to the presence of the higher paraffins may be regarded as entirely eliminated.

Note: It was the intention to carry out helium determinations on the most likely gases, i. e., the high nitrogen ones. It will be observed there were very few of these. Of two selected as promising one gave no helium and the other a distinguishable quantity.

[1] Lebeau and Damiens, loc. cit.

MAKING TIGHT JOINTS.

The B. F. Goodrich Rubber Company is making a special drive in telling layers of pipe how they can make their joints gas-tight by using their coupling-rubbers which are known as "Grade 19."

The difficulties met with on account of disintegration caused by natural gas and gasoline are, it is claimed, dissipated through the use of the specially prepared rubbers manufactured by the company. A clever statement is made, namely, "It's a Coupling Ring with the camouflage left out."

Dost thou love life? Then do not squander time, for that is the stuff life is made of. Franklin.

Water In Wells

Communication by A. E. Boyd, of the Ohio Fuel Supply Company of Ashland, Ohio

Editor Natural Gas and Gasoline Journal.
Dear Sir:

On July 22nd, 1916, I issued a circular letter to all well men working in my district. I thought then to publish the letter, but thinking some skeptics might not altogether agree with me, I concluded to wait and see if there would be any benefits derived from the letter. After watching the results closely for more than a year, and knowing that we have derived much benefit, I thought to ask you to publish the letter that other gas men might profit thereby. The letter to well blowers was as follows:

TO ALL WELL BLOWERS:—

We have been having considerable trouble this summer with some of our well men letting water accumulate in their wells. This makes it necessary to move a large bailing machine in, which is very expensive to the company, and is also very hard on the wells, for quite often after a well has had several hundred feet of water on the sand it takes several days to get it back to its natural production. Now this is not what the company is paying the well men for. They have had a certain number of wells consigned to their care and are supposed to keep the wells in good condition, unless something unusual happens, which is liable to happen to any well. What I mean by this is, a packer may blow out, or a string of tubing may drop once in a while, but these things usually happen to comparatively new wells. As I said before, the well men are supposed to keep their wells in good condition. If the wells make water they are supposed to keep it blowed out as long as the well has gas enough to blow the water out readily, but just as soon as the pressure gets so low it does not lift the water then it is time to begin to swab the well and not wait until it fills up several hundred feet with water and then "holler" for a bailing machine.

Under ordinary circumstances a well should never be allowed to fill up more than a few feet in the tubing with water. If it does it cannot make its natural production, and the well will deteriorate more rapidly. I think some of the men take it for granted certain wells are dry and it is not necesssary to swab them as long as they make a pound on the gauge. This is a wrong idea. They take it for granted the well is O. K. until it is dead, then they try to swab and there is not enough gas to swab with, then they report something wrong with the well. We go in with the large bailing machine and maybe find several hundred feet of water in the tubing. This should not be. I would advise, on a light well, that you run a swab once in a while and find out for sure if there is any water in it.

I believe some of you are doing this. If you are, this does not apply to you. Some of you would have done so but you never thought it necessary. We have some old experienced well men, then we have some who have not had much experience. The object of this letter is to help you to learn and to help you to try to save the company's property and thus gain the end for which the company has you employed, that is, to keep their wells in good condition. Some of you will say, "O, that letter dont apply to me, it is for the other fellow," but I think every one of you can get a little good from it. A part of it will apply to any of you. I know I receive a great many circular letters from the company and there is always part of them that applies to me in some way or other.

I will admit some of our well men are causing us very little trouble and are keeping their wells in good shape, while there are others who are causing us a great deal of trouble. I will be frank with you and say I think the man who causes the least trouble is the man who watches his well closely and keeps it clean, both from water and salt, and never lets it get the start of him even if he has to put in a long day now and then and occasionally has to work on a Sunday. That man has the easiest job in the end, anyway. The other fellow lets a well get the best of him. He works "like thunder" on it a day or two, has to give it up and report the well as being dead, and while he has been monkeying with that one, another well is getting the best of him. "Nip them in the bud," that is what you have to do and that is what constitutes a good well man. That kind of a well man seldom, if ever, has to call for help. He is doing what the company pays him to do, that is, to keep a certain number of wells free from water, salt, etc., as well as saving all the gas for the company he possibly can by keeping all leaks tight, etc.

The same instructions regarding water can be applied to salt. You cannot always tell if a well is salty by the gauge. Open your well occasionally and familiarize yourself with the flow. You can often tell that way if a well is off because of water or salt either one. If a well shows indications of salt put fresh water in it often. Don't wait until the well is salted up.

The measure of a man's life is the well spending of it, and not the length. Plutarch.

LATEST INSTRUCTIONS.

THE following instructions have been issued to gas and oil pipe line companies, and to gas and oil pipe line workers, by the Federal Oil Inspection Board for California. Findings arrived at in the matter of hours for labor and other matters pertaining to the California field are given. The report is signed by the following Federal Oil Inspection Board members: L. P. St. Clair, W. F. Byrne, G. M. Swindell. The rules are as follows:

First: That the eight-hour day shall be put into effect as of Jan. 1, 1918, and shall apply to all work connected with the transportation of oil or gas by pipe lines in all parts of the State of California.

It is the intent and purpose of this ruling that eight hours shall constitute a day's work and longer hours of labor will not be permitted, save in cases of emergency when the protection of life and property requires working longer hours, which extra time shall be compensated for by an allowance of an equivalent amount of time during some subsequent day.

In the event that, because of an inadequate supply of labor, lack of sufficient quarters or for other good and sufficient reasons the eight-hour day has not been put into effect, on the day specified, the workers will work, and they are hereby requested by this Board to work, until further notified, such additional hours as may be necessary and they shall be paid for such extra work on a pro rata hourly basis of the day's wage.

All pipe-line workers are expected to work a full eight hours per day; time for beginning and ending work as well as length of time allowed for lunch to be fixed by each company, but in all instances to be reasonable. Where work is located at a considerable distance from boarding house or other central station, men will go to their work on company time and return on their own time, with the proviso that loss of time to workers shall not exceed 20 minutes per day.

Second: The minimum wage for pipe-line workers shall be $4 per day, which wage shall apply as of Dec. 1st, 1917.

The term "pipe-line worker" as used above is meant to apply to all workers who are continuously employed, directly or indirectly, in the transportation of oil or gas, including telegraph operators, linemen and linewalkers. It is not intended to include commissary or office help, other than telegraphers, or the casual worker who is a mere incident to the business and not continuously employed therein.

This ruling, so far as gas lines are concerned, is to apply to natural gas lines originating within the boundaries of any oil field, and only affects those workers who are employed in the production of gas within the oil fields or engaged in work along the pipeline systems, but does not apply to workers employed within the limits of municipalities.

All pipe-line workers, in any class except those exempted, who left the service on or after Dec. 1, 1917, will be entitled, upon demand, to an adjustment between the wage paid at the time of settlement and the wage fixed in the ruling mentioned above.

Third: No employe shall be discriminated against by reason of his membership in any labor organization affiliated with the American Federation of Labor, nor shall any employe not a member of any labor organization be intimidated by members of such organizations.

Any infraction of this rule should be reported to this Board for adjustment and settlement, and offending parties will be dealt with as conditions justify.

Fourth: All disputes or disagreements between employers and employes, on any matters connected with the carrying out of the findings or their interpretation by this Board, must be submitted in writing to this Board for adjudication.

Any employe who leaves his work, or any employer who discharges an employe without good or sufficient reasons therefor, or any employer or employe who undertakes to act arbitrarily in the premises, prior to submission of and determination by the Board of any matter of dispute or disagreement and the final ruling of the Secretary of Labor thereon, will be viewed as an insurgent unworthy of the good influences of the Board or the protection of the Federal Government.

In this connection it may be well to remind all concerned that to this Board and only to this Board, has been delegated the authority of interpreting the Santa Barbara findings and of deciding all questions pertaining to their application and the method of putting them into effect.

MEASUREMENT OF GAS BY ORIFICE METER.

The title of this notice is the title of a recently published hand-book of which we have previously spoken, but regarding which we would desire to again make mention. The book is by Henry P. Westcott, member of the American Society of Mechanical Engineers, and author of "Hand Book of Natural Gas," Hand Book of Casinghead Gas," and Measurement of Gases Where Density Changes." The work has 400 pages, containing 30 sets of Tables. A full description with plainly written instructions for measuring gas by Orifice Meter.

Complete set of Pressure Extension Tables from 29 inches mercury vacuum to 500 pounds pressure.

Complete tables of Coefficients for 4, 6, 8 and 10 inch Pipe Lines.

Tables for percentages fast or slow when error is found in differential pen arm or in specific gravity used.

Various tables and data necessary to the Orifice Meter owner.

Pocket size (4⅝ 7½), clearly printed from new type on specially made paper.

The price in Cloth binding is $3.50, Leather bound it is $4.00.

The book is published by Metric Metal Works, of Erie, Pa.

No one knows what he can do till he tries. Syrus.

Gasoline From Natural Gas

Conservation of Gasoline in Natural Gas is Recognized More and More as a Vastly Important Branch of the Industry.

By J. C. McDOWELL.

In General Charge of the Doherty Oil and Natural Gas Properties.

THE petroleum industry is a development of the present generation. The man is yet living in Pittsburgh who purchased the first tract of land on which to drill for petroleum, upon the completion of the Drake well, near Titusville, Pa., in 1859. A small refinery was in operation in Pittsburgh prior to the completion of the Drake well, however, running on crude oil obtained from wells drilled and operated for salt near Tarentum, Pa. The Drake well has been recognized as the pioneer well, probably because it was the initial venture undertaken solely for petroleum.

From the small beginnings of Oil Creek days in the 'sixties, the business has grown until its magnitude and importance attracts general attention and increasing popular interest. The wide geographical range of its deposit, the element of risk and romance in its discovery, interesting tales of fabulous fortunes grasped in a day, of hopes deferred, hearts made sick and final financial ruin in the quest of oil, are some of the features of public interest. But the real reason of the popular interest in the petroleum industry is that the products of petroleum have such an important place in every industry and every household, contributing largely to the necessities and pleasures of humanity in every grade of life, and dwellers in the remotest regions of the earth are touched by it through the energy of the men engaged in its trade. A little Chinese child can purchase a yen's worth of oil a thousand miles up the Yangtse-Kiang river from a boat owned by the company that produces the crude from its own wells in Ohio or Kansas.

The development of another youthful industry—the automobile and internal combustion engine—has revolutionized the oil industry and created a new and vital interest in it. Less than twenty-five years ago gasoline was a by-product of the refinery, difficult to dispose of at any price. Now the industry is taxed to its limit by the demand for motor fuel (gasoline) and lubricating oils, and it is a subject of general concern from what source the ever growing requirements for these products are to be supplied.

NATURAL GAS.

From the beginning of the oil industry, gas in more or less quantities has been found in petroleum deposits and produced along with oil, and many wells drilled for oil produced gas only. Prior to about 1880 but slight use was made of the gas other than to use it for fuel in boilers, and some use was also made of it for domestic fuel in dwellings on the lease. The great bulk of it, however, was wasted, its presence being a nuisance to the operator to be got rid of.

About 1880 the qualities of natural gas as fuel began to be appreciated, and the natural gas industry began. Its growth, slow at first, soon attained importance. The invention of the automatic pressure regulator, the rubber coupler joint, permitting the use of pipe of large diameter and consequent capacity; the gas compressor and improved methods of combustion soon greatly enlarged the area of its profitable distribution, the cost of transportation and safety of its use. At the present time it is one of the great industries of the United States and Canada, with an investment exceeding $350,000,000 and an annual income of over $100,000,000. It has grown with accelerated speed, 1916 being the year of maximum production and earnings.

NATURAL GAS GASOLINE.

Although it has been known from the early period of the oil industry that under some conditions light gravity condensates were recoverable from natural gas, it is within the last few years, since gasoline became of great commercial consequence, that this branch of the petroleum and natural gas industry began to be developed.

In the gasoline industry natural gas is classified in two divisions, "wet" gas and "dry" gas. Gas produced from the same sand as oil is known as "wet" gas, while gas produced from stratum (sands) that produce gas only, is termed "dry" gas. Yet there is no clear line of demarcation between so-called "wet" and "dry" gas. When a well is first drilled, the quantity of gas escaping with the oil is frequently great, the gas flow in time diminishing. When gas comes with the flowing oil the two can be separated by a gas trap, and plants are frequently erected to extract gasoline from this "wet" gas. Oil wells that have ceased flowing and are pumping, usually continue to produce much gas at the casing head. It is this casing head gas from which the bulk of natural gas condensate is now being recovered.

Be not careless in deeds, nor confused in words, nor rambling in thought. Aurelius.

Natural gas is a mixture of hydrocarbons of the paraffine series, also usually containing very small portions of nitrogen, carbon dioxide and water vapors. A sample of "wet" gas recently analyzed showed the following composition:

Methane	37.4%
Ethane	32.0%
Propane	20.1%
Butanes, Petanes, Hexanes, etc	10.5%
Total Inc. 1.03 Nitrogen	100.0%

The "dry" gases are usually very high in methane, sometimes as much as 95 per cent. Methane cannot be liquefied by ordinary commercial methods, consequently the gasoline content of natural gas is recovered from the lower hydrocarbons, ethane, propane, butane, etc.

There are two general methods of recovering condensates from natural gas. Briefly, they may be described as follows:

(a) Compressing the gas by means of an air compressor adapted to the purpose. Cooling the compressed gas by means of condensing coils, by use of water, air or artificial refrigeration.

(b) The Absorption Method—Passing the gas through towers, or receptacle in contact with heavy oils, (used as a menstrum). Then heating the oil in ordinary stills to a point where the light vapors absorbed by the menstrum pass off as vapors, which vapors are reduced to condensates by the usual methods of condensation.

The first method used only with "wet" gas has many variations, embodying the ideas of many inventive men. Although patents are extant claiming to cover the basic principle, no attempt has been made to enforce them. There are, however, many patents on special devices of more or less merit.

COMPRESSION PLANTS.

A plant for recovering gasoline from casing head gas was erected in the vicinity of Titusville, Pa., near the Drake well in 1904. The equipment was crude. The gas, compressed by gas pumps, was condensed by means of a pipe coil in a water tank, the condensate dripping into a wooden barrel. The product, when first obtained, had a gravity of 80 to 90 degrees Baume scale, and the loss from evaporation was large. Other plants were installed in that locality soon thereafter. These ventures proving a commercial success, plants of better design and equipment were installed in other oil regions.

At first ordinary gas pumps at pressures of 50 pounds were used; at present compressors—usually two stage—of modern design are installed and the gas is compressed to from 100 to 250 pounds per square inch, depending upon the quality of the gas and the resultant gravity of the condensate.

Speaking generally, the higher the gas is compressed, the higher the resultant condensate. At above 80 degrees Baume the evaporation of the product at atmosphere is very rapid. The quantity of gas consumed or utilized in the recovery of the gasoline is but a small percentage of the total volume compressed. The waste gas, or gas from which the gasoline has been recovered, can be used for fuel and internal combustion engines. The recovery of gasoline from casing head gas is from two to eight gallons per thousand cubic feet of gas, depending upon the quality of the gas.

The absorption process is of more recent adoption than the compression process, and installed, usually, to recover condensates from "dry" gas transported through pipe lines to more or less distant markets. The operation of the plant is essentially this:

The plant is erected close to the pipeline, preferably at a gas pipeline compressor station. By suitable connections the gas is diverted through the absorbers —the flow of gas through the pipelines is undisturbed —the gas passes into the bottom of the absorbers, up through the oil and out at the top, and thence on the market. In passing through the absorber, the gas mingles with the oil coming into the absorber from the top, broken and spread by baffles and other devices. The oil descending absorbs gasoline from the gas, and is pumped from the bottom into a still where the gasoline is distilled out of the oil by live steam. The oil, stripped of the gasoline, is then pumped into the absorber to absorb more gasoline, the operation being a continuous circuit of the heavy oil. A weathering tank is in the circuit to get rid of some of the lighter condensates before the oil enters the still. There is also a heat exchanger for cooling the oil before it returns to the absorber. Recently, some absorption plants are also equipped with a compressor plant, which takes the light gases from the weathering tank, and the tail pipe of the condensers reduced them to liquid and mingles them with the gasoline recovered through the absorber.

The heating value of the gas after passing through the absorber is not appreciably lowered, and the deleterious effect of gasoline on the rubber in coupling on the gas pipeline is eliminated.

The absorption process is patented by at least two inventors, and several operators have installed plants and are using the process in defiance of the patentee.

The recovery of gasoline from "dry" gas by the absorption method is comparatively small and depends somewhat on the quality of the gas, but is usually about one pint for each one thousand cubic feet.

Absorption plants are usually installed where large volumes of gas can be treated—in some cases from forty to fifty million cubic feet for each twenty-four hours.

The term "condensate" is a more suitable name for the liquid obtained from natural gas by either process, for some of the liquid obtained is so volatile that it does not come within the meaning of the trade name gasoline.

At present practically all natural gas condensate is mixed with low grade naphtha—a refinery product

before it is marketed. This process is called "blending."

In the early days of the industry "weathering" (or evaporation of the light vapors of the condensate) was necessary for safety in shipping and use. The process of "weathering" frequently caused a loss of from 50 to 75 per cent. By "blending" a product is obtained that has a much slower rate of evaporation than the natural gas condensate, and can be shipped and used with safety. Several methods of blending are in use. The one in most favor now in the Mid Continent field is that of spraying the heavy naphtha into the hot compressed gases as they leave the compressor, both the naphtha introduced (mostly gasified by heat of the compressed gas) and the compressed gas are then passed into the condensers, and the resultant gravity reduced to a comparatively stable product.

This method seems broadly covered by the Hall McArthur patent, and its use results in a recovery of 25 to 50 per cent more merchantable product than when the "blending" is done simply by mixing the condensate and low grade refinery naphtha.

It is customary to test the gas proposed to be used to determine its gasoline contents before installing a plant, and a close determination of the true result can be arrived at by such tests.

The average compression [illegible] a plant handling [illegible] hours is profitable [illegible] cubic feet is considered [illegible]. The installation of a plant involves [illegible] which gas is to be used [illegible] the casing head gas to the compression plant [illegible] as suitable tankage and [illegible] hundred oil wells are [illegible] pipe line system.

GROWTH OF THE [illegible]

The production of gasoline [illegible] gallons in 1914 to [illegible] gallons in 1915. The increase for 1915 over 1914 was [illegible] per cent. During 1915, 65,364,665 gallons were extracted [illegible] of 53 per cent over 1914. An average [illegible] cents per gallon was received [illegible] product, the value of the year's output [illegible]. It is estimated that twenty-four [illegible] natural gas was utilized in the manufacture [illegible] average recovery of 2.57 gallons of gasoline per thousand cubic feet.

It is estimated that the production [illegible] was approximately 100,000,000 gallons [illegible] over $12,500,000.

FUTURE OF THE IN[illegible]

While every gas well is a potential producer of gasoline, there are many reasons why they are not utilized for the manufacture of gasoline. Among these reasons are:

(1) **Insufficient** yield of gas.
(2) **Unfavorable** location.
(3) **Poor quality** of gas.

Yet there are many millions of feet of casing head gas now going to waste that will be utilized. The time is near when a gasoline plant will be as much a part of a well equipped oil lease as the power plant for pumping the wells now is. The business is profitable under proper conditions, and conservation is always popular when it is profitable.

—Courtesy Industry News

MONTHLY STANDARD OIL REVIEW

[illegible]

DURING the past three weeks, the local Gas stocks on light trading have shown little change in the quotations. At the advanced price, Ohio Fuel Supply has been active both on the local board and in New York, opened at 43½, selling high at 43⅞ and low at 42¼. The Company will have the best statement in its history showing a handsome increase over previous years. Ohio Fuel Oil was dull, selling over [illegible] trading light. Oklahoma Natural Gas sold unchanged at the [illegible] price [illegible] on old lots. Pittsburgh [illegible] and [illegible] and 63⅛ high. [illegible] Gulf Oil was [illegible] trades reported.

[illegible] with light trading [illegible] in many cases [illegible] on good [illegible]. Its earn[illegible] than 18% on [illegible] amount $[illegible] [illegible] a turn.

[illegible] increase in earn[illegible] a book value [illegible] year equal to [illegible] like a purchase [illegible].

[illegible] Penn[illegible] normal [illegible] Mex[illegible] wells.

[illegible]

[illegible] year. [illegible]

Promise is most given when the least is said. Chapman.

Illinois Pipe Line, believing that both have more future. The dividends declared so far this year show no change; with the advancing prices of crude oil, the outlook for the producing company are extremely flattering.

Standard Oil Company of New York through purchase of the minority interest in Magnolia Petroleum with which they did a great deal of business, gives it an additional earning power. The buying of this stock for the past six months, looks like accumulation and the surplus should amount to the capital stock. Looks like a purchase if you are willing to hold it. The increase of the capital stock of the Magnolia Petroleum from $30,000,000 to $60,000,000 is one of the indications of the rapid expansion of the business, and the necessity of amply capital to carry on the business on a large scale.

Midwest Refining sold low at 106, and up at 111. The Imperial Oil Company of Canada have denied that they own the control of the same. The passing of the leasing bill before the house should benefit both Midwest Refining and Midwest Oil, as it will provide a way of settling law suits without further litigation.

Northwest Oil moved up from 58 to 68. Have well down 2400 feet which is an offset to a well several months old doing 500 barrels. This stock offers a good looking speculation, as with other wells drilling they should soon have a nice production.

Cosden & Company moved from 7 to 8¼. Come selling of the dividend stock noticeazle, but it being well absorbed. With all depreciation and taxes deducted, earnings are expected to show a big return on the common. Looks like a purchase and should sell higher.

Oklahoma Producing & Refining statement was rather a disappointment, although it does not show the exact conditions of the company which are much better than the figures would indicate. Stock has been quoted around 7 to 7⅛.

Sinclair Oil & Refining Company have completed their pipe line to East Chicago. This will have a capacity of 20,000 barrels a day, part of which will go to Kansas City Plant and the balance to the new plant at East Chicago. Report for nine months after deducting fixed charges, income, and excess profit taxes and depreciation, show at the rate of $5.12⅛ for the year. The last quarter is expected to be somewhat better than the third quarter, and earnings should show present dividends more than earned.

Sapulpa Refining sold low at 8 and high at 8¾. The Company are in excellent financial shape and fully earned their dividend and a nice surplus.

¶ **The next thing to genius is the ability to appreciate genius, but greater than either is the ability to utilize genius, whether your own or another's. — *Ginger***

VICTORY PLANT IN SERVICE.

IN the City of Buffalo, N. Y., for the building of turbine engines, a great plant, representing $3,000,000 investment, has been set in operation. The first cuts made on two Bullard vertical turret lathes on wheel forgings, were after 2:45 o'clocok on February 22nd, immediately following the starting of the great plant, sent to Secretary of the Navy Daniels at Washington, a telegram being despatched by Mr. E. B. Germain, General Manager of the Black Rock works of the Bethlehem Shipbuilding Company, announcing that the manufacture of turbine engines for torpedo boat destroyers had been begun at the great plant in Buffalo, which plant is owned by the United States government, but is being operated by the company mentioned.

Buffalo again shows itself possessed of vast facilities added to its already almost numberless manufacturing institutions.

The manufacturing enterprises in the "Queen City of the Lakes" are so diversified as to represent an exceedingly broad line of opportunity to serve the peoples of the United States while ensuring the City of Buffalo against ill effects from any mishap occurring to, or strikes occurring in any one particular line of industry. Buffalo is a great city with great industries, and a great future.

NEW ORLEANS AND NATURAL.

IF things keep on, New Orleans will have natural gas. There certainly is good prospect of such a result being attained. The following star has arisen on the horizon. It is Mr. T. H. Lackland, Manager of the Big Ben Oil Company, with offices at Peoria, Ill. Mr. Lackland's company, owns leases on approximately 10,000 acres in gas-producing section, all of which is within piping distance of New Orleans, so he states, and he says that he would be glad to negotiate for a franchise to serve the city of New Orleans.

FINANCIAL REPORT.

BY JO. P. CAPPEAU SONS.

	Open	High	Low	Last
Columbia G. & E.	35	35	35	35
Fayette Gas	..	..	..	110
Mfg. L. & H.	52	53½	51⅜	51⅝
Ohio Fuel Supply	43½	43⅞	42⅛	42⅝
Ohio Fuel Oil	16	16	15½	16
Oklahoma Gas	25	25	25	25
Pgh. Oil & Gas	5¾	6¾	5½	6¾
Pure Oil Com.	24½	24½	24¼	24¼
Cent. Kentucky Gas	..	..	..	22
Lone Star Gas	96	100	96	100
Union Gas	..	..	..	153½

Talk of nothing but business, and despatch that business quickly. Miscellaneous.

RESULTS OF DRILLING—LATEST REPORTS

PENNSYLVANIA FIELD

ALLEGANY FIELD

MIDDLE FIELD

VENANGO CLARION

SOUTHWEST PENNSYLVANIA

WEST VIRGINIA

SOUTHEASTERN OHIO

PENNSYLVANIA FIELDS

SUMMARY OF COMPLETED WORK

CENTRAL OHIO

Remember that time is money Franklin

FAIRFIELD COUNTY.

Walnut—Kenney, Logan Gas & Fuel 4 ..... Gas

KNOX COUNTY.

Brown—J. Hendricks, Ohio Fuel Sup. 1..... Gas
Jas. Temple, Upham Gas 1 ..... Gas

Gas 2

ASHLAND COUNTY.

Green—Lathrow, Ohio Fuel Supply 1 ..... Gas
M. Tungend, Ohio Fuel Supply 1 ..... Gas
W. Paulin, Ohio Fuel Sup. 1 ..... Gas
Hanover—Brubaker, Logan Gas & F. 2 ..... Dry
Mohican—J. M. Gill, Logan Gas & Fuel 1 ..... Gas
Lake—A. Long, Ohio Fuel Supply 1 ..... Dry
Montgomery—S. Rice, Ohio Fuel Sup. 1..... Gas
Jackson—R. Welch, Ohio Fuel Supply 1..... Gas
..
Dry 2
Gas 6

MEDINA COUNTY.

Westfield—Steele, Ohio Fuel Supply 1 ..... Gas
Homer—E. A. Fike, Ohio Fuel Supply 1..... Gas
Medina—Hardinger, Ohio Fuel Supply 1 ..... Gas
L. S. Ball, Medina Gas & Fuel 1..... Gas
Lafayette—Champan, Logan Gas & F. 1..... Gas
Levi Lance, Ohio Fuel Supply 1 ..... Gas
H. Huff, Ohio Fuel Supply 2 ..... Gas

Gas 7

WAYNE COUNTY.

Congress—Grundelsperger, Logan Gas & Fuel 1.... Gas
J. & M. Packard, Logan Gas & Fuel 2..... Gas
Franklin—W. P. Snyder, Ohio Oil 9..... Gas
Cannan—F. Eby, Medina Gas & Fuel 1..... Gas
Wayne—Specht, Ohio Fuel Supply 2 ..... Gas
M. Seib, Ohio Fuel Supply 1 ..... Gas
Plain—R. Homey, East Ohio Gas 1..... Dry
W. D. Alleman, Medina Gas & Fuel 1 ..... Dry
Clinton—M. Richey, Medina G. & F. 1 ..... Gas

Dry 2
Gas 7

RICHLAND COUNTY.

Monroe—Yarnell, Ohio Fuel Supply 1 ..... Gas
C. E. Shearer, Logan Gas & Fuel 1 ..... Dry

CUYAHOGA COUNTY.

Dover—F. Cipra, Kundtz & Hulse 2 ..... Gas
E. Tuttle, East Ohio Gas 1 ..... Gas
B. M. Schuster, East Ohio Gas 1 ..... Gas
J. D. Wagner, East Ohio Gas 1 ..... Gas
C. Wilbert, East Ohio Gas 1 ..... Dry

Dry 1
Gas 4

VINTON COUNTY.

Richland—Cath. R. Poling, Ohio F. S. 3..... Gas
Abram Cassill, Ohio Fuel Supply 1..... Gas
T. J. Thatcher, Ohio Fuel Supply 1 ..... Gas
L. H. Tripp, Ohio Fuel Supply 1 ..... Gas
Chas. Sowers, Ohio Fuel Supply 3 ..... Gas

Elk—Mary E. Winters, Ohio F. & S. 1..... Dry
Dry 1
Gas 5

JACKSON COUNTY.

Washington—L. Poland, Ohio F. S. 2 ..... Gas
Superior Dev., Ohio Fuel Sup. 1..... Gas

Gas 2

PERRY COUNTY.

Thorn—E. M. Swick, Ohio Fuel Sup. 2 ..... Gas
Chas. Boring, Ohio Fuel Supply 1 ..... Gas
Chittenden lot, Heisey Gas 1 ..... Gas

Gas 3

HOCKING COUNTY.

Salt Creek—Wm. Hamman, Ohio F. S. 1..... Gas

HOLMES COUNTY.

Washington—Lozier, Logan Gas & Fuel 1..... Gas
Lenninger, Logan Gas & Fuel 1 ..... Gas

Gas 2

COSHOCTON COUNTY.

Tiverton—Koch, Logan Gas & Fuel 1 ..... Gas

MARION COUNTY.

Clarion—Foos, Persoll & Stewart 2..... Dry

CENTRAL OHIO FIELDS.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry.	Gas
Licking	4	0	1	3
Fairfield	1	0	0	1
Knox	2	0	0	2
Ashland	8	0	2	6
Medina	7	0	0	7
Lorain	0	0	0	0
Wayne	10	25	2	7
Richland	2	0	1	1
Cuyahoga	5	0	1	4
Vinton	6	0	1	5
Jackson	2	0	0	2
Perry	3	0	0	3
Hocking	1	0	0	1
Holmes	2	0	0	2
Coshocton	1	0	0	1
Marion	1	0	1	0
Total	55	25	9	45

KENTUCKY-TENNESSEE.

WOLFE COUNTY.

Campton—J. H. Brewer, Calwell & Fike 2..... Dry
Stillwell—D. Rose, McMann Oil & Gas 1 ..... Dry
Sam Whisman, Ky. Pet. Producing 2..... Dry

Dry 3

LAWRENCE COUNTY.

Busseyville—Jas. Short, Ohio Fuel Oil 2..... Dry
Wilbur—O'Bryan, Mullin & White 1 ..... Dry

Dry 2

MORGAN COUNTY.

Cannel City—Oldfield, Mullin & Mullin 3 ..... Gas
Murphy, Yancy Hudson & Co. 1 ..... Gas
White Oak—W. H. Vance, Atlantic Oil & Gas 1 .... Dry

Dry 1
Gas 2

ESTILL COUNTY.

Irvine—J. Wallace, West Penn 1..... Dry
Chas. Rice, T. H. Yates 8 ..... Dry

Dry 2

POWELL COUNTY.

Pilot—J. M. Ashley, Pat J. White 48 ..... Dry
I. T. Rogers, Ohio Oil 5 ..... Dry
Fruitt—Miller, Pet. Exploration 13 ..... Dry
Cain Rogers, Barnett Oil & Gas 1..... Dry

Dry 4

Be wise to-day; it is madness to defer. Young.

ALLEN COUNTY.

Scottsville—Roark, McClanahan & Nicoll 1 ..... Dry
Benedict, McClanahan & Nicoll 1 ..... Dry
F. M. Mitchell, Clark & Co. 1 ..... Dry
Smith, Unknown 1 ..... Gas

Gas 1
Dry 3

MAGOFFIN COUNTY.

Salyersville—Sport Fork, Rice Oil 1 ..... Gas

JOHNSON COUNTY.

Paintsville—Paint Lick Dome, Federal Oil 2..... Gas

WARREN COUNTY.

Bowling Green—E. Harris, Johntzen Co. 2..... Dry
Luther Jackson, Chenault Oil & Gas 1..... Dry

Dry 2

ELLIOTT COUNTY.

Isonville—J. Dials, Rice Oil 1 ..... Gas

KENTUCKY-TENNESSEE.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry.	Gas.
Wayne	2	10	0	0
Wolfe	7	115	3	0
Lawrence	5	11	2	0
Morgan	3	0	1	2
Estill	13	120	2	0
Powell	21	217	4	0
Lee	5	105	0	0
Allen	9	75	3	1
Knox	2	10	0	0
Magoffin	2	10	0	1
Johnson	3	20	0	1
Warren	2	0	2	0
Barren	2	25	0	0
Elliott	1	0	0	1
Total	77	718	17	6

ILLINOIS FIELD.

CRAWFORD COUNTY.

Montgomery—W. H. Conrad, J. J. Cauley & Co. 3.. Dry

CLINTON COUNTY.

Irishtown—J. E. Rogers, Spurgeon, Davis & Co. 1.. Gas

WABASH COUNTY.

Friendsville—Toney, Midland Oil & Gas 2..... Dry

KANSAS.

BUTLER COUNTY.

10-25- 5, Johnson, Hazlett et al 1..... Dry
33-25- 5, Stokes, Empire G. & F. 59..... Dry
11-26- 4, Orban, Carter Oil 21 ..... Gas
1-26- 5, Sharp, Eldorado Harper Emporia O. & G. 1 Dry
9-26- 5, White, Wood & McIntyre 1 ..... Dry
26-26- 5, Sluss, A. L. Derby et al. 2..... Dry
18-28- 4, Freed, Magnolia Petr. 3..... Dry
7-26- 3, Hennenkamp Uncle Sam Oil 1 ..... Dry
30-24- 4, Adams, J. B. Adams 1 ..... Dry
16-25- 5, Robinson, Standard Oil of Ind. 2..... Dry
6-26- 5, Porter, Carter Oil 13 ..... Gas
26-26- 5, Sluss, Whitewater Oil & Gas 2..... Dry
31-26- 5, Clough, Wrightsman et al. 1..... Dry
14-28- 4, Bottom, Mid Kansas Oil 1 ..... Dry

Gas 2
Dry 12
Gas 2,000,000

MONTGOMERY COUNTY.

12-32-13, Wudick, Cuttes & Connor 1..... Dry
7-34-14, Blake, J. G. Smith et al. 1..... Dry
30-34-15, Wheeler, Commonw. O. & G. 4..... Dry
30-34-15, Wheeler, Commonw. O. & G. 5..... Dry

Dry 4

ALLEN COUNTY.

34-26-16, Bigelow, Columbine Oil & Gas 3..... Dry

MIAMI-FRANKLIN-DOUGLAS COUNTIES.

16-17-22, William. Racine Oil 4..... Gas
6-16-10, Overstreet, Lucky Four 1 ..... Dry
5-17-22, Singert, Bartlett et al. 1..... Dry
20-17-21, Furnace, Pacific Oil 1 ..... Gas
36-16-21, Downs, Hirsh 1 ..... Dry
26-16-21, Perry, Wood 1 ..... Dry

Dry 4
Gas 2
Gas 800,000

CHAUTAUQUA AND ELK COUNTIES.

Elk City—
34-32-13, Gilbert, Sachem Oil 1 ..... Dry
33-32-13, Roebuck, Rickard et al. 1..... Dry
29-31-13, Dexter, Bliss & Co. 2..... Gas
29-31-13, Hogan, Bliss & Co. 2 ..... Dry
Sedan—
32-33-11, Kirchner, Scott Co. Oil 2 ..... Dry
32-33-11, Kirchner, Scott Co. Oil 3 ..... Dry
Elgin—
34-34-10, Hewitt, Elgin Oil 5 ..... Dry

Dry 6
Gas 1
Gas 1,000,000

NEOSHO COUNTY.

14-27-19, Whitworth, Globe Crude 1 ..... Gas
22- 8-19, Johnson, Riverside Oil 7 ..... Dry
2-28-18, Nixon, Parkins & Co. 1 ..... Dry
14-27-19, Whitworth, Globe Crude 2 ..... Gas
36-27-18, Bangard, Republic O. & G. 1..... Dry
25-27-21, Melick, Haggam & Davis 1 ..... Dry

Dry 4
Gas 2
Gas 2,200,000

WILSON COUNTY.

32-30-16, Cramer, P. O. G. 6..... Dry
34-29-16, Scott, Eureka Gasoline 1 ..... Dry
6-29-15. Burnshill, Lucky John Oil 1 ..... Dry
32-29-16, Shannon, Geo. Shannon 1 ..... Gas

Dry 3
Gas 1

WILDCATS.

Crowley County—
9-25- 7, Le Master, Standish Oil 2 ..... Dry
13-25- 7, Bronson, Standish Oil 1 ..... Dry
Greenwood County—
23-24-12, Johnson, Foster Oil 4 ..... Gas
22-25-12, Loveland, Sinclair Oil & Gas 1 ..... Dry
Chase County—
22-30- 9, Hughes, Hatfield Oil 1 ..... Dry
McPherson County—
9-17- 4W., Sangren, Lindsberg O. & G. 1..... Dry
Pawnee County—
29- 3-12, Miller, J. F. Hurst et al. 1..... Dry
Shawnee County—
26-11-13, Pitts, Renker et al. 1 ..... Dry

Men are so apt to believe what they least understand. Montaigne.

Elk County—
8-31-10, Johns, Elec. O. & G. 2 ..... Dry

Gas 1
Dry 8
Gas 500,000

OKLAHOMA.

WASHINGTON COUNTY.

17-26-13, Whiteturkey, F. Haskell, agt., 12 ..... Gas
13-29-13, Martin, Denver Oil 1 ..... Dry
13-27-13, Forman, H. S. Roll 1 ..... Dry
24-27-13, Whiteturkey, Coombs et al. 8 ..... Dry
33-28-13, Everett, F. W. C. Boleche 1 ..... Dry
2-27-13, Ketchum, P. O. & G. 1 ..... Dry
28-28-15, Shepard, Boschee et al. 1 ..... Dry
5-28-15, Chestnut, Shufflin et al. 6 ..... Dry
5-28-15, Cokar, Kunny et al. 6 ..... Dry
4-28-15, Merrell, Campbell et al. 1 ..... Dry
27-28-13, P. O. & G. 6 ..... Dry
17-28-14, Fitzsimmons, E. V. Crowell 2 ..... Gas
16-28-13, Step, Kaufield Oil 1 ..... Dry
16-28-13, Dick, Youngson Oil 1 ..... Dry
4-28-15, Merrill, H. E. Campbell et al. 1 ..... Dry
5-28-15, Coker, E. S. Kunny et al. 6 ..... Dry
28-28-15, Shepard, Boschee et al. 1 ..... Dry

Dry 15
Gas 2
Gas 700,000

OSAGE COUNTY.

25-22-10, Tidal Oil 1 ..... Dry
4-22-11, Kansas Natural Gas 5 ..... Gas
35-24, 8, Carter Oil 2 ..... Dry
9-25- 9, Drexel Oil 2 ..... Dry
4-22- 9, H. V. Foster 1 ..... Dry
15-26-11, Workman Oil 4 ..... Dry
4-22-11, Osage, Tidal Oil 5 ..... Gas
33-21-12, Texas Co. 6 ..... Dry
16-26-12, Lahoma Oil & Gas 43 ..... Dry
19-21-12, Tidal Oil 1 ..... Dry
8-20-12, Tidal Oil ..... Dry
20-21-12, Tidal Oil 1 ..... Dry
18-22- 9, Kiskadden et al. 1 ..... Dry

Dry 11
Gas 2
Gas 5,000,000

NOWATA AND ROGERS COUNTIES.

15-24-17, Palmour, Amalgamated Pet. 9 ..... Dry
2-24-16, Ketchum, Ellis Oil 2 ..... Dry
1-24-16, House, G. French & Hogue 12 ..... Dry
15-24-16, Adams, D. F. Roberts 2 ..... Dry

Dry 4

TULSA COUNTY.

Bird Creek—
36-22-13, Tulsa Fuel 2 ..... Gas
23-23-13, Albina Oil ..... Gas
28-20-14, Thompson, Henry O. & G. 2 ..... Dry
35-22-13, Sequick, Tulsa Fuel 1 ..... Gas
28-20-14, Henry Oil 1 ..... Dry
Red Fork—
20-19-11, Hardridge, E. B. Howard 1 ..... Gas
8-19-11, Sunday Island, Nelson O. & G. 1 ..... Gas
Broken Arrow and Jenks—
24-19-13, Perryman, Burton et al. 1 ..... Dry
14-18-14, Atkins, Ellis Oil 2 ..... Dry
32-18-14, Burgess, Cunningham & Graham 3 ..... Dry
Bixby—
19-17-13, Manuel, New York Oil 1 ..... Dry
17-17-13, Crosby, Sparks Oil 8 ..... Dry
27-16-13, Roberts, Braden et al. 1 ..... Dry
6-16-14, Craig & Sherman 1 ..... Gas
11-16-14, Craig & Sherman 1 ..... Gas
25-16-14, Nevins, Carter Oil 2 ..... Dry
17-17-13, Crosby, United Prod. 11 ..... Dry
19-17-13, Austin, Billingslea et al. 1 ..... Dry
20-17-13, Berryhill, Gladstone Oil 2 ..... Dry
21-17-13, Tiger, J. H. Fisher, 4 ..... Dry
1-16-13, Murray, Hubbard & Co. 2 ..... Dry
8-16-13, Cowles, Winemiller et al. 4 ..... Gas
19-16-13, Gorndorfer, Wilcox et al. 2 ..... Dry

Dry 15
Gas 8

OKMULGEE COUNTY.

Mounds—
33-16-11, Simmons, Texas Co. 1 ..... Dry
29-14-14, Ashley, Sperry Oil & Gas 6 ..... Gas
33-15-13, Roberts, Tidal Oil 3 ..... Dry
22-15-14, Seiver, Paw Paw Oil 4 ..... Dry
1-14-13, Robertson, Bryan et al. 1 ..... Dry
20-14-14, Jefferson, N. Y. & Henry Oil 6 ..... Dry
20-14-14, Sadler, N. Y. & Henry Oil 11 ..... Dry
31-15-13, Pigeon, Standard Royalties 1 ..... Dry
21-14-14, Grayson, Sperry Oil & Gas 13 ..... Gas
1-15-14, McIntosh, Texas Co. 5 ..... Dry
Okmulgee Morris—
30-13-13, Harjo, Barbara Oil 2 ..... Gas
34-13-14, Fat, Mt. Fork Oil 3 ..... Gas
34-13-14, Fat, Texas Co. 1 ..... Dry
34-13-14, Fat, Rebold et al. 1 ..... Gas
8-13-14, Myers, Lucinda Oil 50 ..... Dry
Hamilton Switch—
36-14-11, Unallotted, Okmulgee P. & R. 32 ..... Gas
1-13-11, Newman, Kimbley & Cook 1 ..... Dry

Dry 11
Gas 6
Gas 75,000,000

MUSKOGEE, WAGONER AND ROGERS COUNTIES.

Catoosa—
10-20-14, Harris, Tulsa Fuel 1 ..... Gas
Inola—
28-19-15, Vannoy, Lane Oil & Refining 1 ..... Dry
27-18-16, Williams, F. V. Wright 1 ..... Dry
23-18-16, Childers, F. V. Wright 9 ..... Dry
Coweta—
30-17-15, Brown, Loffland et al. 2 ..... Dry
Stone Bluff and Haskell—
17-15-16, Banks, Davis et al. 5 ..... Dry
21-16-15, Drew, Melba Oil 5 ..... Dry
7-16-16, Richards, Carter Oil 1 ..... Dry
17-15-16, Harrison, Caney River Gas 2 ..... Gas
9-16-15, Vann, Black Hawk Pet. 1 ..... Gas
20-16-15, Asbury, Melba Oil & Gas 2 ..... Gas
15-16-15, Porter, Anco Oil 1 ..... Dry
16-16-15, Ballard, Ross et al. 4 ..... Dry
6-15-16, Smith, Summers et al. 1 ..... Dry
30-15-16, Howard, Boynton Oil & Gas 6 ..... Dry
1-15-16, Smith, Patterson, Scully et al. 1 ..... Dry
2-14-15, Manuel, Oiler et al. 1 ..... Dry
3-14-15, Smith, Hasura et al. 1 ..... Dry
13-13-15, Smith, Winemiller et al. 1 ..... Dry
18-14-17, Lewis, Eastern Okla. Oil 1 ..... Dry
22-13-16, Grayson, Lucky Strike Oil 1 ..... Dry
18-15-15, Henderson, Caney River Gas 2 ..... Dry
17-15-16, Banks, Peterson et al. 4 ..... Dry
31-14-15, Colbert, Laurel Oil & Gas 1 ..... Dry
7-13-15, Bruner, Lambert et al. 1 ..... Gas
12-13-16, Grayson, Jolly et al. 1 ..... Dry
18-14-15, Rentie, Kiel et al. 5 ..... Dry

Dry 22
Gas 5
Gas 12,000,000

Fortune turns a cold shoulder to hotheads. Herbert Kaufman.

CREEK COUNTY.

Cushing Pool—
32-18- 8, Raabe, Magnolia Petroleum 1 ..... Dry
16-17- 7, West, P. O. & G. 22 ..... Gas
6-18- 8, Eastman, Waddell & Co. 1 ..... Dry
1-19- 8, Asbury, Samona Oil 1 ..... Dry
21-18- 7, Wacoche, P. O. & G. 6..... Dry
34-17- 7, Renfrow, Cosden Oil & Gas 3 ... . Dry
3-18- 7, Wilson, Commercial Petroleum 1..... Dry
Mannford and Olive—
3-19- 9, Thomas, Markham & Schoenfeldt 1 ..... Dry
3-19- 9, Coonrod, E. N. Gillespie 1 ..... Dry
16-18-11, McIntosh, Livingston Oil 6 ..... Dry
16-18-11, McIntosh, N. Y.-Okla. Oil 6..... Dry
27-18-11, Bruner, Mrs. Northrup 4 ..... Gas
34-18-11, Sapulpa, Sapulpa Fuel 2 ..... Gas
5-17-12, Bosen, Okla. State Oil 22 ..... Dry

Dry 11
Gas 3
Gas 9,000,000

PAWNEE COUNTY.

Maramec—
11-20- 5, Quinan, Devonian Oil 2 ..... Dry
25-21- 8, Thomas, Markham et al 2..... Dry

Dry 2

PAYNE COUNTY.

Yale—
19- 6, Jones, Magnolia Petroleum 3 ..... Gas
2-18- 5, Laughlin, C. B. Shaffer 2 ..... Gas

Gas 2
Gas 15,000,000

GARFIELD AND NOBLE COUNTIES.

Garber District—
30-22- 3, Windler, Sinclair O. & G. ..... Gas
15-22- 3, Barnes, Oil State Pet. 1 ..... Gas
Billings—
2-23- 2, Armstrong, Paragon Oil 1 ..... Dry

Dry 2
Gas 1
Gas 11,000,000

KAY COUNTY.

Ponca City—
9-26- 3, Ruby, Okla-Kansas Oil 1 ..... Dry
Blackwell—
29-28- 1, Perry, National Union 1 ..... Gas
6-28- 1, Harvell, Blackwell O. & G. ..... Gas
6-28- 1, Smith, Kay & Kiowa 3 ..... Dry
29-27- 1, Presbury, Empire G. & F. ..... Gas
Newkirk—
17-28- 3, Russell, Marland et al. 1..... Gas

Dry 2
Gas 5
Gas 41,000,000

CARTER COUNTY.

Healdton District—
33- 2- 3, Hickman, Hickman O. & G. 1..... Dry
31- 3- 3, Westheimer & Daube 9 ..... Dry
30- 3- 3, Daney, J. L. Hamon 10 ..... Dry
17- 2- 3, Hernstadt, Summit Oil 1 ..... Dry

Dry 4

WILDCATS.

Pontotoc County—
17- 4- 6, Urban, Skelly & Sankey 2 ..... Gas
32- 5- 7, Benedum & Trees 1 ..... Gas
Pawnee County—
26-22- 6, Arnold, Cosden O. & G. 1 ..... Dry
Creek—
21-17- 5, Gypsy Oil 1 ..... Dry
Okfuskee County—
10-12- 6, Jenkins, Gypsy Oil 1 ..... Dry
Ellis County—
16-25-25W., LaVerne O. & G. 1 ..... Dry
Washita County—
18-11-19W., Wilcox, Elk O. & G. 1..... Dry
Kiowa County—
10- 7-10W., Rednour et al. 1 ..... Dry
22- 7-16W., Huber, J. L. Nation 1 ..... Dry
27- 7-16W., Rosser-Weiss 1 ..... Dry
8- 7-15W., M. C. Ent et al. 1..... Dry
Caddo County—
28- 5-11W., Polk-Clark Oil 1 ..... Dry
Tillman County—
12-1N-16W., Frensley, Guiding Star Oil 1 ..... Gas
Cotton County—
23-1S-10W., Tilly, John Keys et al. 1 ..... Gas
26- 1-10, Gross, Keys et al. 1..... Gas
Garfield County—
9-21- 3, Bowers, Kantexo Oil 1 ..... Gas
Okfuskee County—
28-13-10, Knight, Carter Oil 1 ..... Dry

Dry 11
Gas 6
Gas 68,000,000

ARKANSAS.

Crawford County—
28- 9-30, Embry, Wildcat Oil 1 ..... Gas
Hot Springs County—
19- 4-16, Henson, Taylor Henson 1 ..... Dry
Ashley County—
20-16- 5, Louisiana, Ark. Land Co..... Dry

Dry 2
Gas 1

KANSAS.

SUMMARY OF WELLS COMPLETED.

	Comp.	Prod.	Dry.	Gas.
Butler	64	14,765	14	2
Chautauqua	21	315	6	1
Montgomery	32	269	4	0
Wilson	22	91	3	1
Neosho	34	300	4	2
Allen	8	50	1	0
Miami-Franklin-Douglas	40	389	4	3
Wildcats	11	700	8	1
Total	232	16,879	44	10

OKLAHOMA.

SUMMARY OF WELLS COMPLETED.

	Comp.	Prod.	Dry.	Gas.
Osage	53	2,072	11	2
Washington	47	610	15	2
Nowta-Rogers	49	407	4	0
Tulsa	37	390	17	8
Creek	43	2,135	11	4
Okmulgee	75	2,327	11	6
Muskogee-Wagoner-Rogers	42	875	22	5
Payne	14	2,818	1	2
Pawnee	9	340	2	0
Garfield-Noble	9	5,075	2	2
Kay	14	2,250	4	4
Carter	19	720	5	0
Wildcats	21	10	14	4
Total	442	20,029	118	39

Second thoughts, they say, are best. Dryden.

MID-CONTINENT.

SUMMARY OF WELLS COMPLETED.

	Comp.	Prod.	Dry.	Gas.
Kansas	232	16,879	44	10
Oklahoma	442	20,029	118	39
Arkansas	2	0	1	1
Total	676	36,908	163	50

TEXAS PANHANDLE.

WICHITA AND WILBARGER COUNTIES.

Electra—
Smith, Pyle et al. 1 ..... Dry
Granger, Duncan-Electra Oil 1 ..... Dry
Tate, Federal Oil 15 ..... Dry

Dry 3

CULBERTSON DISTRICT.

Waggoner Bros., Lazy Nine Oil 1 ..... Dry
Jennings, Tarver Oil 1 ..... Dry

Dry 2

BURKBURNETT.

Schnarre, Magnolia Petroleum 10 ..... Dry
Harden, Mann et al. 27 ..... Dry
Fowler, C. B. Hammond 4 ..... Dry
Harris, Smith & Myers 1 ..... Dry
Birk, Parker-Ezell Co. 5 ..... Dry
Roller, Kell et al. 1 ..... Dry

Dry 6

WILDCATS.

Stephens County—
Lauderdale, Texas & Pacific Coal 1 ..... Dry
Maxwell, Texas & Pacific Coal 1 ..... Dry
Young County—
Lisle, Empire Gas & Fuel 1 ..... Dry
Parker County—
Mortens, Parker County Oil & Gas 4 ..... Dry
Palo Pinto County—
Stewart, Texas & Pacific Coal 3 ..... Dry
Terry, Empire Gas & Fuel 1 ..... Dry
Grayson County—
Near Tom Bean, Fortuna Oil 1 ..... Dry
Coleman County—
Babbington Mutual Petroleum 1 ..... Dry
Eastland County—
Carruth, Desdemona Oil 1 ..... Dry

Dry 9

NORTH LOUISIANA.

Caddo—
16-21-15, School Fee, The Texas Co. 1 ..... Dry
3-20-15, Subdivision, Louisiana Pet. 1 ..... Dry
De Soto—
25-13-12, Grand Bayou Planting, The Texas Co. 18. Dry
Bossier—
2-16-12, Gayle, Arkansas Natural Gas 64 ..... Gas
Miscellaneous—
27- 9-14, Hatcher, Federal Petroleum 1 ..... Dry
22-22-13, Bridger, La. Oil Ref. Corp. 1 ..... Dry
21-22-13, Dudney, Dallas Oil 1 ..... Dry
22-22-13, Gleason, Petroleum Co., Inc. 1 ..... Dry
29-11- 6, Giddens, Ark. Nat. Gas 58 ..... Dry

Dry 8
Gas 1

GULF COAST.

SUMMARY OF COMPLETED WORK.

Dist.	Comp.	Prod.	Dry.
Anse La Bute	0	0	0
Batson	2	55	0
Damon Mound	4	1,500	3
Edgerly	5	265	3
Goose Creek	15	2,900	6
Humble	35	1,355	17
Jennings	4	90	2
Markham	0	0	0
Spindletop	8	575	1
Saratoga	1	20	0
Sour Lake	6	1,805	2
Vinton	3	260	1
New Iberia	1	0	1
Piedras Pintas	1	0	1
Miscellaneous	13	210	10
Total	98	9,035	47

STANDARD OIL SUBSIDIARIES.

BY JO. P. CAPPEAU SONS.

		Open	High	Low	Last.
£1	Anglo-American	11½	11¾	11¼	11½
$100	Atlantic Ref.	930	930	900	910
100	Borne-Scrymser	430	430	430	430
50	Buckeye Pipe	95	97	95	97
100	Chesebrough	320	320	320	320
100	Colonial	10	10	10	10
100	Continental	470	470	460	460
50	Crescent	32	32	32	32
100	Cumberland	125	135	125	135
100	Eureka	200	200	190	195
100	Galena Com.	137	140	135	137
100	Galena Pref.	125	125	120	120
100	Illinois Pipe	190	190	185	190
50	Indiana Pipe	93	93	93	93
12½	National Transit	12½	12½	12½	12½
100	New York Transit	180	185	180	185
100	Northern Pipe	98	100	98	100
25	Ohio Oil	332	335	328	335
100	Prairie Oil	495	495	465	472
100	Prairie Pipe Line	255	270	250	270
100	Solar Refining	290	290	290	290
100	Southern Pipe	188	190	180	180
100	South Penn. Oil	285	290	280	285
100	South West Penn. Pipe	95	95	90	90
100	S. O. of California	232	232	225	228
100	S. O. of Indiana	640	640	630	630
100	S. O. of Kansas	470	470	460	460
100	S. O. of Kentucky	320	320	310	310
100	S. O. of Nebraska	480	480	480	480
100	S. O. of New Jersey	567	573	550	555
100	S. O. of New York	283	283	273	278
100	S. O. of Ohio	410	410	410	410
100	Swan & Finch	95	95	95	95
100	Union Tank	86	86	85	85
100	Vacuum Oil	355	355	340	345
10	Washington Oil	25	25	25	25
25	Penn-Mex.	45	45	43	43
5	International Petroleum	12½	13¼	12½	13¼
	Independent Oil Companies.				
5	Elk Basin	6⅝	6⅝	6	6⅝
25	Pierce Oil	9¾	9¾	9½	9½
50	Midwest Refining	110	110	106	100
25	Tropical Oil	5½	5½	5½	5½
5	Cosden Refining	7	8⅛	7½	8⅛
5	Sapulpa Refining	8¼	8¾	8	8¾
1	Northwest Oil	62	66	58	66
5	Northwest Oil Pfd.	3⅝	3¾	3⅝	3¾
5	Okla. Producing & Refg.	7	7⅛	7	7
5	Atlantic Petroleum	3½	3⅝	3¼	3½
10	Merritt Oil	20½	23	20	21
1	Midwest Oil	112	113	108	109

A man used to vicissitudes is not easily dejected. Johnson.

AROUND THE BELT

New Wells, New Pipe Lines, New Contracts, Additions and Extensions. A Fund of Valuable News Gathered for the Journal Through Many Sources

TRADE PERSONALS

[illegible] that the names appearing [illegible] are those [illegible] gas field. These visiting [illegible] gas men are [illegible] of natural gas in [illegible] THE GAS INDUSTRY magazine published at the Pear Street Buffa[illegible] N. Y. which devotes its [illegible] entirely to artificial gas matters. That magazine is published by the proprietors of THE NATURAL GAS JOURNAL each magazine being [illegible] issued for the convenience of [illegible] In this way each magazine [illegible] with news of the industry it serves. Publisher's Note

WANTED [illegible]

[illegible] Manager of the Pagett Natural [illegible] Manager of the [illegible] Western Gas Co. [illegible]

[illegible] A [illegible]

[illegible]

[illegible] Manager of the [illegible]

[illegible] Western Natural Gas Co. [illegible] New York City.

[illegible] Manager of the [illegible] Bureau of Standards.

[illegible] Frank H[illegible] Manager of sales [illegible] Western Natural Gas Co. [illegible] Rochester, New York.

[illegible] Natural Gas Co. [illegible] Indian Territory Illuminating Oil Co. [illegible] Cincinnati.

[illegible] Manager of the [illegible] Western Natural Gas Co. [illegible] New York City.

[illegible] Manager of the [illegible] Western Natural Gas Co. [illegible] New York City.

[illegible]

[illegible]

[illegible]

INCORPORATED

DELAWARE [illegible] Dover

[illegible]

INDIANA Terre Haute

[illegible]

Excess of wealth is cause of covetousness Marlowe

WEST VIRGINIA—Clarksburg

A certificate of incorporation has been granted the C. J. Sams Drilling Company, $10,000 capital stock; to drill for oil and gas in Clark and Cass Districts, Harrison County, and elsewhere in West Virginia. The incorporators are C. J. Sams and Emma Sands of Amandville, W. A. Gaylord, W. T. Wallis of Clarksburg, and G. L. Pettrey of Wilsonburg.

NEW FRANCHISES

NEW YORK—Chautauqua

Application for permission to construct a gas plant in Mayville, and in the town of Chautauqua, has been filed with the Second District Public Service Commission by the South Shore Natural Gas Company, whose capital stock is owned by the Frost Gas Company of Buffalo.

TEXAS—Dallas

The Dallas Gas Company has accepted the franchise conditions offered by the city. The service-at-cost plan will be followed, and the company will be under the supervision of the Public Utilities Commission. The rate provided in the agreement is 50 cents per thousand gross: This the price under which the company has been operating.

WASHINGTON—Yakima

The Spokane-BentonCounty Gas Company has filed application for a gas franchise in this city. The gas fields from which the city would be supplied are located in Benton County, 40 miles east of this city.

PER CUBIC FOOT—RATES

ARKANSAS—Fort Smith

Gas rates have been increased in this city by the Wild Cat Oil & Gas Company.

MISSOURI—Carl Junction

Gas rates for domestic and industrial purposes have been advanved to 50 cents per thousand by the Carl Junction Gas Company and the Oronogo Gas Company.

NEW YORK—Albany

The Public Service Commission, Second District, has decided that the maximum price charged by the Addison Gas & Power Company for natural gas to its consumers in the village of Addison shall be 48 cents per thousand feet, with the privilege, however, to fix a gross rate at not to exceed 53 cents, with five cents discount for payment on or before the 18th of the month following rendition of service. This rate is to continue for three years from March 1, 1918, unless the Commission shall fix a different rate.

Corning

The local natural gas company has increased its gas rates.

Lancaster

The Iroquois Natural Gas Company has served notice on the village board that April 1st the rate on gas will be increased to 35 cents a thousand to consumers here. The rate now is 32½ cents a thousand with a discount of 2½ cents if bills are paid by the 15th of the month.

WEST VIRGINIA—Charleston

The United Fuel Gas Company has obtained permission from the Public Service Commission to put in force in this city and Barboursville, the following rates: Domestic service—Eighteen cents per thousand cubic feet, subject to a discount of one cent per thousand if paid on o rbefore the tenth day of the following month.

Manufacturing or industrial service: First 150,000 cubic feet, 18 cents per thousand; next 150,000 cubic feet, 17 cents per thousand, all subject to a discount of one cent per thousand if paid on or before the 30th of the following month.

The present industrial rate for gas in excess of 300,000 feet is 11 cents. No increase was sought in this rate.

Coalburgh

The Public Service Commission has authorized the United Fuel Gas Company to increase its rates 33⅓% in this city, as well as in Huntington.

Elkins

The local gas rate for domestic consumers has been advanced from 25 to 30 cents.

Wheeling

Permission is being sought by the City & Suburban Gas Company to increase its rates for domestic gas from 25 to 31 cents, and its rates for industrial gas from 20 to 28 cents.

ITEMS OF FINANCE

KENTUCKY—Louisville

The Louisville Gas & Electric Company of Louisville, Ky., a subsidiary of the Standard Gas & Electric Company, under the management of H. M. Byllesby & Company, has sold a new issue of $1,600,000 7 per cent two and one-half year secured notes. The proceeds will be used chiefly for retiring notes which mature April 1st, next. The new notes which mature September 1, 1920, will be offered publicly tomorrow by H. M. Byllesby & Company, Bonbright & Company and Wakefield & Company, of Louisville, at 97¾ to yield 8 per cent. The notes are secured by deposit of the company's mortgage bonds, pledged with the trustees

Where law ends, tyranny begins. Pitt.

NEW YORK New York City

Washington

IOWA Eldridge

Cincinnati

KANSAS Garnett

PENNSYLVANIA

KENTUCKY Louisville

GENERAL

LOUISIANA New Orleans

ALABAMA—Birmingham

Augusta

OHAIO—Delta

DISTRICT OF COLUMBIA Washington

MARYLAND Baltimore

laws to the Legislature under which gas companies may mix artificial with natural gas.

Collins Center

A good gas well has been drilled in on the Bates brothers' farm, about two miles south of the village.

New York City

The following appointments are announced by the Worthington Pump & Machinery Corporation, 115 Broadway, New York City: James E. Sague, Vice-President, in charge of Engineering and Manufacturing; Leon P. Feustman, Vice-President, in charge of General Commercial Affairs, including contracts, prices, purchases, traffic, etc.; Frank H. Jones, Vice-President, in charge of sales; William Goodman, assistant to Vice-President; William Schwahausser, Chief Engineer; Edward T. Fishwick, General Sales Manager; Charles E. Wilson, Assistant General Sales Manager; Neil C. Lamont, Works Manager, Laidlaw Works, with office at the works, Elmwood Place, Cincinnati, Ohio.

NORTH DAKOTA—Grand Forks

Drilling for water supply in this section recently resulted in the bringing in of a fairly good gas well.

OHIO—Hocking County

In the Brinkhaven development in Tiverton Township, the Logan Natural Gas Company drilled a second test on the Lewis Reece farm through the Clinton sand. Nothing was found but a gas pressure, with an estimated capacity of 500,000 cubic feet a day.

OKLAHOMA—Creek-Tulsa Counties

The No. 5 Northrup well is reported to be making 5,000,000 cubic feet of gas. This well is located on the Bruner farm, in Section 27-18-11, and was drilled to a depth of 1,660 feet.

H. U. Bartlett's No. 1 on the Spocogee farm, in the northwest of the southeast quarter of Section 34-18-11, is producing 4,000,000 feet of gas from sand at 1,600 feet. The Mount Vernon Oil Company drilled a dry hole to 1,605 feet in its No. 9 in the southwest corner of the northwest of the southwest quarter of Section 9-18-12. The Oklahoma State Oil Company has a 5,000,000-foot gasser in No. 33, in the southwest of the northeast quarter of Section 18-17-12.

Enid

Consumers are asking that the Oklahoma Natural Gas Company shall install booster stations on its pipe lines to eliminate the inconvenience of gas shortage which has been experienced during the past winter.

Hamilton Switch

Kimbley & Cook's No. 1 Henry, in the northeast of the southeast quarter of Section 36-14-11, is a 7,000,000-foot gas well from sand at 2,052 feet.

Muskogee

An 8,000,000-foot well in Section 29-16-15, took fire recently, which it took considerable ingenuity to extinguish. The well was down 1,465 feet when it was accidentally ignited. The rig and casing will be replaced and the well drilled deeper.

Oklahoma City

The name of the Southwestern Association of Petroleum Geologists has been changed to The American Association of Petroleum Geologists. A convention of the Association was held in this city recently, and at this meeting it was decided that the scope of the organization should be extended to cover the entire country instead of only the southwestern section. The new officers elected are: President, Alexander Deussen, Houston, Texas; Vice-President, Dr. I. C. White, Morgantown, W. Va., State Geologist of the same State; Secretary and Treasurer, W. E. Wrather, Wichita Falls, Texas.

Okmulgee County

In Mounds District, Foster & Davis have a 4,500,000-foot gasser on the Glass farm in the southwest of the southeast quarter of Section 27,16-11.

The Cosden Oil & Gas Company completed a 2,500,000-foot gasser in No. 1 Bird, in Section 35-13-12.

Osage

The Standish Oil Company has a good gasser in Section 17-35-7.

The Indian Territory Illuminating Oil Company's No. 1 in Section 14-24-9 came in an 8,000,000-foot well.

The Osage Hominy Oil Company's No. 43 in Section 9-28-8, is a gas well with an output of about 2,000,000 feet.

In the Osage District, the Henry Oil Company's No. 1 in the northeast of the northwest quarter of Section 10-23-8, showed 4,000,000 feet of gas at 2,390 feet and a showing of oil at 2,418 feet.

Payne County

In Ripley District, Section 27-19-4, the Fortuna Oil Company's No. 1 on the Miller farm, in the center of the south line of the west half of the southwest quarter of Section 27-19-4, struck a gas flow in sand, the top of which was at 3,445 feet. The well was doing 27,000,000 feet of gas at last report and had been drilled to 3,467 feet.

Payne County

In the Yale District, the Roma Oil Company drilled in a 10,500,000-foot well at 2,824 feet in its No. 2 in the southeast quarter of Section 35-19-5.

Red Fork

Nelson and others have a large gasser in their No 1 in the southeast of the northwest of Section 9-18-11, at a depth of 1,630 feet.

The Paxton Oil & Gas Company have completed a gasser in their No. 2 on the Harding farm in the southeast corner of Section 19-19-11.

Billingslea and others have completed a good gasser in No. 1 on the Cato farm, in the southwest of the northwest quarter of Section 29-19-11.

Patience is a necessary ingredient of genius. Disraeli.

County

the Bixby District, three-quarters of a mile ... production. Davis and others have a ... gasser in the center of the south line of the ... quarter of Section 14 17 13

mer County

... South American Oil & Gas Company ... d a ... gasser in ... in the south ... Southwest quarter of Section ... 17 13 at a ... 1,750 feet

ington County

... Bartlesville District the Keystone Oil Com ... completed No. 1 on the Frank Wilson farm in ... 25 13 and has a ... gas well in ... time at ... feet. The ... Oil Com ... Green, Section 27 25 13 is a ... gasser

gatown

... Manufacturers Petroleum & Refining Company's ... on Section ... the ... farm was ... in good quantity ... it was decided ... feet deeper. ... reported that a ... was ... at ...

NSYLVANIA—Greene County

... Jefferson District of the ... West Virginia ... Mary Patterson farm.

Delphia

AS Brownwood

... about ... Mrs. Lena Jeffries ... development ... recent ... coming summer

ne

... West Second Street, Los Angeles. K. S. Sterling, Treasurer. Steward Orland, Secretary. These officers with Ed Paggi and Charles Noble compose the Board of Directors.

WASHINGTON—Olympia

The Puget ... and Natural Gas & Refining Company has been incorporated in this city.

Spokane

The Spokane Benton County Natural Gas Company has struck gas in the second well drilled in the Benton County ... and has ... sequently with fewer ... to stock from the market.

WEST VIRGINIA—Calhoun County

On Steer Creek, Sherman District, the Hope Natural Gas Company's test on the ... farm is a gasser in the Big Injun sand.

Doddridge County

On Big Isaac Creek, Greenbrier District, the Hope Natural Gas Company's test on the ... farm is a gasser in the Big Injun sand.

Elm Grove

The well at ... drilled on the county farm at ... at a depth ... Kanawha ... and a ... to the ...

Gilmer County

Kanawha County

Example is always more efficacious than precept Johnson

Knox County

In the Brinkhaven District, the Forbing Drilling Company has the rig completed for a second test on the Robert Crider farm and the Logan Natural Gas Company has rigs completed for two tests on the Lewis Reese farm.

Lewis County

On Wolf Run, Freeman's Creek, Freeman's Creek District, the Reserve Gas Company has completed a test on the Calvin Flesher farm. It is a fair gasser in the Big Injun sand.

On Freeman's Creek, Freeman's Creek District, the Reserve Gas Company completed a Gordon sand gasser at its test on the W. T. Garten farm.

Lincoln County

On Straight Fork, Duval District, the South Penn Oil Company has completed No. 8 on the M. A. Bays farm.

Marion County

On Quaker Fork, Mannington District, the Carnegie Natural Gas Company's test on the Mary A. Shaw farm has been completed through the Gordon, developing a light gas pressure.

Marshall County

On Ben's Run, Liberty District, the Manufacturers Light & Heat Company's test on the Samuel Ernest farm is a light gasser in the Big Injun Sand.

On Fishing Creek, Liberty District, the Carnegie Natural Gas Company has drilled No. 3 on the H. G. Fair farm into the Maxon sand, developing a gasser with a capacity of 15,000,000 cubic feet a day.

On the same stream and in the same district, the Manufacturers Light & Heat Company has a good gasser in the Big Injun sand at a test on the John M. Rhine farm.

On Grave Creek, Cameron District, the same company's test on the J. I. Dorsey farm is a light gasser in the Gordon sand.

In Liberty District, the Manufacturers Light & Heat Company has drilled its test on the A. J. McGlumphy farm through the Gordon sand. It is a gasser in that formation.

Ritchie County

In Clay District, the Philadelphia Company has completed No. 6 on the E. R. Taylor heirs' farm. It is showing for a light gasser in the Big Injun sand. On the same stream and in the same district, the Hope Natural Gas Company has a fair gasser at its test on the J. M. Wilson farm, and in Center District, Gilmer County, the same company has a gasser in the Big Lime and Squaw sand at its test on the M. E. Boggs farm.

Roane County

On Rock Creek, Walton District, the Jarvis Oil Company has drilled its No. 4 on the Nancy C. Lowe farm, a gasser in the salt sand, to the Big Injun formation and it is showing for a 10-barrel pumper.

Tyler County

In Central District, the Manufacturers Light & Heat Company has drilled its test on the A. Fuche farm, and has a gasser. In the same district the Hope Natural Gas Company drilled its second test on the Robert heirs' farm, and it is dry in that formation and drilling deeper.

Wetzel County

On Little Creek, Center District, the Hope Natural Gas Company's test on the James T. Brookover farm is showing for a light gasser in the Gordon sand.

In Greene District, the Manufacturers Light & Heat Company's test on the Sarah Ashcroft farm is a gasser in the Big Injun sand. In the same district, the Philadelphia Company's test on the E. A. Glover farm is dry in all sands.

WYOMING—Casper

According to a bill which is expected to pass Congress soon, one man may take up 2,560 acres in this State with one-eighth royalty, and is constrained to complete a well to 2,000 feet in two years under penalty of forfeiture unless oil or gas is found in paying quantities at a lesser depth.

The lease is to be in force for a term of 20 years with a renewal clause in case the oil or gas is still being produced. One man or firm must not hold more than the allotted acreage in any one field and relief is to be given to those who have drilled wells on withdrawn lands by allowing them to continue the development of the properties which have been lying idle for some time pending a decision by Congress on this point.

Salt Creek

The Midwest Refining Company has placed in operation its casinghead gasoline plant in this field. The plant is equipped to handle 4,000,000 cubic feet of gas per day, and cost in the neighborhood of $400,000 to construct.

ALBERTA—Edmonton

In the Viking field, east of Edmonton, the Alberta Volcanic Oil Company has finished No. 1. This was drilled for oil, but developed a good gasser.

ONTARIO—Elgin County

The Dominion Natural Gas Company has completed a large gasser near Port Talbot. The initial flow is estimated between 5,000,000 and 7,000,000 cubic feet, with 500 pounds rock pressure. The well is strictly a wildcat proposition being located a short distance up the creek from Port Talbot, and a considerable distance from any other producing well. The location is about 10 miles from Port Stanley, and is in territory where the Dominion Natural Gas Company has been drilling for some time.

We cannot succeed at anything if we are uncertain. Millard Fillmore.

The production is secured from about 1,500 feet, a little deeper than the usual pay formation in the Elgin gas fields.

Toronto

The Department of Mines, at Toronto, has just submitted to the Ontario Legislature a report on mineral production for the province for 1917. Referring to gas the report says in part:

"The output of the natural gas wells (for Ontario) was the highest yet recorded. Owing to widespread distress, caused by the partial failure of the gas supply during the present winter, the Legislature has placed the entire natural gas industry under control of the Ontario Railway and Municipal Board."

PATENTS RECENTLY GRANTED.

The following recently granted patents are reported expressly for NATURAL GAS AND GASOLINE JOURNAL by Green & McCallister, Patent Attorneys, 1338 Oliver Building, Pittsburgh, Pa., from whom printed copies may be procured for 15 cents each:

Well Drilling Machine, William K. Riley, San Bernardino, Cal. 1,245,274.

Stuffing Box for Oil Well Pumps, Charles A. Swanson, Los Angeles, Cal. 1,245,286.

Rotary Well Pump, Frank J. Kimball, Los Angeles, Cal., assignor to Frank J. Kimball Company, Los Angeles, Cal. 1,245,466.

Rotary Boring Drill, Howard R. Hughes, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex. 1,245,462.

Sucker Rod for Deep Well Pumps, Charles O. Salberg, Ridgway, Pa. 1,246,329.

Means for preventing clogging of the working barrels of pumps Robert E. Carmichael, Damon, Tex. 1,246,543.

Process of Reducing Crude Petroleum, Chauncey Forward, Urbana, Ohio. 1,202,823.

Screw Point for Well Tubings, John Wallace, Houston, Tex. 1,202,928.

Pump, Elmer A. Watts, Springfield, Ohio. 1,202,932.

Process and Device for Separation of Oils, Sidney Cornell, Pawling, N. Y. 1,202,969.

Drill, Robert U. Harris, Whittier, and George Molidor, Fellows, Cal., assignors to Rotary Disc Bit Company, Fellows, Cal. 1,203,112.

Sand Pump for Wells, Leroy L. Richard, Coalinga, Cal. 1,203,784.

Rotary Boring Drill, Howard R. Hughes, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex. 1,204,022.

Oil Well Valve, Robert H. Thorne, Williamsport, Pa. 1,204,087.

Well Drilling Device, George R. Watson, Waterloo, Iowa. 1,204,099.

Sand Trap for Oil Wells, Clarence A. Wiley, Tulsa, Okla. 1,204,105.

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JOURNAL

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CONTENTS FOR APRIL, 1918

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PUBLISHER'S NOTICE

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CONTENTS OF THIS ISSUE

AROUND THE BELT—

INDEX OF PAST 1918 ISSUES

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Crandall Pettee Co., New York City.
Cutler Hammer Mfg. Co., The Milwaukee

Davis-Bournonville Co., Jersey City
Dayton Pipe Coupling Co., Dayton
[illegible] Gas Burner & Welding Co., [illegible]
[illegible] Engineering Co., Dayton, O.
[illegible] Apparatus Co., Pittsburgh
[illegible] H. Mfg. Co., Bradford, Pa.

[illegible] Pittsburgh
[illegible]

[illegible] Philadelphia, Pa.
[illegible] Mass.
[illegible]
[illegible] Pittsburgh
Fuel Oil Journal, Houston, Texas

[illegible] N. Y.
Gas Age, The, New York City
Gas Appliance Co., Cleveland
Gas Record, Chicago
[illegible] Providence
[illegible]
[illegible] Erie
[illegible] Machine Works, [illegible] N. Y.
[illegible] Akron, O.
[illegible] Cincinnati
[illegible]
[illegible] Gas Burner & Eng. Co., Pittsburgh

[illegible] Pittsburgh
[illegible] Muncie, Ind.
Hays Mfg. Co., Erie
Hart Mfg. Co., Cleveland
[illegible] Mfg. Co., Chicago
[illegible] Butler, Pa.
Hewitt Rubber Co., Pittsburgh
[illegible]
[illegible] Engineering & Supply Co., Pittsburgh

Ideal Heating Co., The, [illegible]
Imperial Belting Co., Chicago, Ill.
Ingersoll-Rand Co., Pittsburgh
International [illegible] Gas Meter Company, [illegible]
Iroquois Natural Gas Co., Buffalo, N. Y.

Jarecki Mfg. Co., Erie
Jiffy Water Heater Co., St. Louis
Jones & Laughlin Steel Co., Pittsburg, Pa.

LaBelle Iron Works, Steubenville, O.
Lattimer-Stevens Co., Columbus, Ohio
[illegible]
[illegible] Cleveland
[illegible] Mfg. Co., Pittsburgh

Ludlow Valve Mfg. Co., Pittsburgh

Macomber & Whyte Rope Co., Chicago
Manhattan Rubber Mfg. Co., Passaic, N. J.
Mark Mfg. Co., Chicago
[illegible] Premix Burner Co., Muncie, Ind.
[illegible] Mfg. Co., Newburyport, Mass.
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Minneapolis Heat Reg. Co., Minneapolis.
Modern Iron Wks., Quincy, Ill.
Modern Safety Iron Co., Philadelphia
Moon Mfg. Co., The, Chicago.
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Natural Gas & Gasoline Journal, Buffalo
New Bedford Cordage Co., New York City
New York Belt'g & Pack'g Co., New York
Nye, A. T. & Son Co., Marietta, O.

Oil & Gas Journal, Tulsa, Okla.
Oil City Boiler Wks., Oil City, Pa.
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Pittsburg Valve, [illegible] Co., Pittsburgh
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[illegible] Gas Engine Co., Oil City, Pa.
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Revere Rubber Co., Chelsea, Mass.
[illegible] Mfg. Co., [illegible] Pa.
[illegible] Mfg. Co., Ltd., Franklin, Pa.
[illegible] & Co., Oil City, Pa.
[illegible] Pump & Mach. Co., Coffeyville, Kansas
Roebling's, John A. Sons Co., Trenton, N. J.
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[illegible]
[illegible] Mfg. Co., Pittsburgh
[illegible] Heater Co., The, Cleveland, Ohio
[illegible]
[illegible] New York City
[illegible] Pa.
[illegible] Pittsburgh
[illegible]
[illegible] Philadelphia
[illegible] Engine Co., Springfield, O.

[illegible] Pittsburgh
[illegible] Buffalo
[illegible] Toledo
[illegible] Mfg. Co., Pittsburgh
[illegible]
[illegible] N. Y.

[illegible]
[illegible] Pittsburgh
[illegible] Mfg. Co., [illegible]
[illegible] Wheeling
[illegible] Pa.
Worthington Pump & Mach. Corp., Buffalo
[illegible] Mass.

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ANNUAL CONVENTION NATURAL GAS ASSOCIATION OF AMERICA AND ANNUAL EXHIBIT [illegible]
ASSOCIATION OF NATURAL GAS SUPPLY MEN, MAY [illegible]

TRUCK OPERATORS' CONFERENCE.

AN operator of motor trucks recently said to the editor of THE NATURAL GAS AND GASOLINE JOURNAL, "We are getting down to dots in this matter of operating motor trucks in many of the other fields, and your gas-men should see to it that they grasp the opportunity available, whereby to put the operating of trucks in the gas business upon the right basis."

At the Hotel Astor on March 8th and 9th the assembling truck operators some time since scheduled a conference such as has also been held in Detroit, the purpose being helpfulness to one another through the discussing of topics on truck operation and maintenance with the purpose of eliciting practical discussion that the experiences, methods, and means employed by one should be made known to the other.

These subjects, while often illustrated with examples taken from the speakers' own individual experience, primarily cover principles of operation and maintenance as easily applicable to one business as another. Were detailed plans discussed, the average user attending might say: "That may be all right for the speaker, but my business is different."

When the principles of quicker loading through planning the work ahead, better mechanical facilities, bonus plans to the loading gang and careful dispatching were clearly explained by such men as Irving A. Berndt, of Ryerson, Chicago, and J. A. Hanley of Hudson, Detroit, their hearers get mental pictures of what they might themselves do to quicken shipments and reduce costs.

Handling drivers to secure greater results with less controversy is one of the main points discussed. At Detroit most emphasis was laid upon gaining the drivers' good will by allowing them to share in the profits resulting from their handling more tonnage at a lower cost.

One who was present at the Detroit conference between truck operators, stated to us that some six different plans of "bonuses to truck drivers" were discussed, as were plans for dividing between the company and the men the saving in cost under a certain sum per ton-mile. In some cases, the results have been those of large bonuses to men as well as material saving to the employer.

It is almost unbelievable that in the case of one truck, this bonus plan caused an increase of 99.9 per cent in ton-miles hauled, with a reduction in cost of 64.7 per cent. Efficiency thus attained reduces the actual hauling cost to about one-third of what it had been under normal conditions.

The maintenance of trucks and truck fleets either in cases where one or two trucks are employed, or other cases where many trucks are used, is given attention at these conferences

Advancing costs of labor and materials, and a need for the use of inexperienced drivers, makes it all-important that operators of trucks should be on the alert to improve their maintenance methods

Reducing tire costs, methods of accurate accounting, forms of inspection, selecting drivers and training men, coping with problems, the outcome of the war, the relieving of freight congestion by rapid trucking methods, all have their part at these conferences which are purely educational in character No admission is charged, and each executive or transportation manager who attends, finds himself in an atmosphere free from sales talk, as nothing of the kind is allowed by manufacturers or sales representatives of concerns manufacturing trucks, tires, or accessories

These conferences are held for the purpose of encouraging, instructing, and aiding the men who are meeting truck problems every day The three sessions of the New York conference March 8th and 9th were announced quite in advance, as Friday morning and afternoon, and Saturday morning

As the use of trucks and trailers in the gas field is growing as an appreciated quantity, a vast number of trucks and delivery cars being already in operation in the gas field, these interests should watch closely the results of these truck operators' conferences and should wherever opportunity presents send representatives to the conferences as a dollars and cents saving and a service developing feature

Edward F LaShum of the American Express Company New York City, has explained at these conferences how by careful inspection and the "maintain as they go" policy, his company has reduced its lay up time to twelve days every two years, while many concerns represented admitted five times that lay up as their average

At the New York conference the subjects mentioned will receive attention, as will those of reducing tire costs accurate accounting methods inspection, selecting and training drivers Meeting the problems brought on by the war and the part truck operators are taking in relieving terminal freight congestion in Greater New York will be interestingly brought out by local speakers

Members of the Highways Transport Committee were among those present and gave an insight into the latest developments in what the Government expects of truck operators

FROM THE EDITORIAL MAIL BAG

THE THIRD LIBERTY LOAN AND VICTORY.

THE people of the United States will soon be called upon to subscribe to the Third Liberty Loan which, like its two predecessors, will be for the purpose of financing the war against Germany and Austria-Hungary. The amount of money which the third bond issue will represent is not yet of general public knowledge,—perhaps the authorities at Washington have not decided that question. But there is no doubt that it will amount to several billions of dollars.

That the third loan will be oversubscribed as were the first and second bond issues is the fervent hope of every patriotic American. The nation is at war and war calls for the expenditure of huge sums of money. But every dollar subscribed helps by so much to shorten the conflict, thereby bringing peace with victory nearer and in its train a return to normal prosperity. Americans should never lose sight of the fact that when subscribing to these Liberty Loans they are doing not only their duty to the United States, but they are placing their funds in the safe keeping of the Government,—investing their money in the securities of the wealthiest nation on earth at terms of interest bearing returns that nets a handsome profit on the investment.

Readers of the NATURAL GAS AND GASOLINE JOURNAL will require no special urging to induce them to make investments in this unexcelled profit-bringing and patriotic Third Liberty Loan bond issue.

SHIPMENTS TO OIL AND NATURAL GAS COMPANIES.

UNDER date of March 25th there was issued from the office of the United States Railroad Administration circular No. C. S. 1-A, under which, in Class "G" an exemption from the railroad embargo is made for supplies for oil and natural gas wells. Under this exemption the railroads are supposed to receive all supplies for natural gas companies. This circular is signed by W. C. Kendall, Manager of the Car Service Section.

All freight addressed to oil and natural gas companies should be marked "OIL AND GAS WELL SUPPLIES." This should also appear on the bill of lading.

GASOLINE EXPORTS.

Exports of gasoline for the 12 months ended December, 1917, were 224,811,186 gallons, with a value of $49,049,580, an increase of approximately 30 per cent over preceding year, when 167,928,262 gallons, worth $33,614,957, were exported.

GIVE THE GEOLOGIST HIS DUES.

THE following plea for the geologist of which W. S. Sterret is the author, recently appeared in the Doherty News, published for Doherty interests.

A geologist man, on a hot summer's day
Was pecking at rocks just for the pay,
A farmer drove by and he said, "Look out!
There's a crazy man here just tearing about."
But the geologist cuss kept at his work
And not for a week did he ever once shirk,
He looked at the ground and then at the sky—
He wrinkled his brow, which was half a foot high;
He walked up a hill and then down again.
He kept doing this while 'twas hotter than sin.
The farmer came back with some of his crowd—
He talked and talked till his language grew loud:
"Git out o' this place as fast as you can,"
He yelled at the working geologist man.
"Mebbe so, ye can't do me any bad harm
But I want no nuts on this here farm.
If he be a feller what's huntin' bugs
Go back tew town where they keep jugs;
We're doin' some better'n we did down Texas,
'Cause we're makin' a livin' an' payin' our taxes;
So git right off an don't make no trouble
Or we'll bust yo' outfit jest like a bubble."
The geologist man was deaf as a mummy
But he gave the gink a coin to be chummy.
He continued his magic with such perfect skill
That the mystified rube went home with a chill.
He juggled his aneroid and little hand level,
In a fashion that looked like the work of the devil—
He found with clinometer dope of the dips
But no word came ever from his closed lips.
His eye was glued to his new alidade,
While the farmer's crew stood by in the shade.
It took many days 'til the highbrow was pleased—
Then he flew to his den like a man who was greased.
For a day and a night he worked like a fool
While the rest of the world was enjoying the cool.
He mapped out the logic of domes and things—
Tested the waters of brooks and springs;
He counted the freckles on lots of rocks
And took from nature the key to her locks.
He made his report to the man with the "tin"
And fell into bed feeling just about "in."
The man with the "tin" rushed out a drill
And commenced to punch on the crest of a hill.
In a few months' time the gusher got busy
And gushed so hard it made the world dizzy.
The higher up got a million for "his"
And the farmer went north for his "rheumatiz."
The geological man got his name in the paper—
But his portion of swag resembled a wafer.

Carry On! Buy More Liberty Bonds!

SECURE GAS LINE.

THE following data from, and illustrations kindly loaned by, the Ohio Fuel Supply Company, will give some idea of river conditions where a gas line crossed the Miami River just south of Troy, Ohio. It was rather recently that the

GAS LINE RESTING ON STONE.

Ohio Fuel Supply Company took over the work of supplying gas to the cities of Troy, Piqua, Sidney, etc., where the Miami Valley Gas and Fuel Company

COFFER DAM MADE OF SAND BAGS.

distributes gas. One of the first things the Ohio Fuel did was to go over the main supply lines and put them in first-class condition.

A ten-inch supply line, running from the Sugar Grove, Ohio, compressing stations, carried gas to the cities of Troy, Piqua and Sidney, and it was made sound and tight from end to end.

The Miami is over 200 feet wide at the point we have mentioned, and here the old line used to swing only about three feet above the top of the water, resting on piles of stones. Here the current is always swift. But

LOWERING GAS LINE BELOW RIVER BED.

when the river was in flood the pipe was put to a great strain, because it was usually under water and acted as a dam, against which roots of trees, stumps and debris of

JUST BEFORE THE RIVER COVERED UP.

all kinds collected. It was a mighty shaky situation and just why it had never snapped, stopping the gas supply to those Miami valley towns, is one of the things that not even an Ohio Fuel engineer could explain. It surely was due for a break.

Don't Put Off till Tomorrow the Bond You Can Buy Today.

The Fuel Supply Company has a policy of keeping its entire equipment in "fighting" condition, regardless of the great expense, and the construction branch of the Engineering Department set to work to eliminate this weak place. Oscar Krebs figured out a plan and he was in charge of the work.

It was decided to drop the line from a position of some three feet above the water line to a safe position three or four feet under the bed of the river, making a drop in the line of more than ten feet, because the water at this place, even in normal times, is from four to five feet deep. But the big difficulty was to do this work without shutting off the flow of gas to the towns supplied. Here was some problem.

The work was completed in November of last year after five weeks of steady, hard work, and "without dropping a stitch," as the ladies now say. The photographs published show in part how the work was done.

In picture No. 1, we see the big line as it was just when the men started to work. They are getting ready to drag away one of the heavy stumps that had been lodged against the side of the pipe.

In photograph No. 2 is shown a section of the coffer dam and in the foreground two sections of the suction pipe used to pump the water out of the coffer dam. The work was done by making two coffer dams, first on one side of the river and next on the other, letting the river run around the end of the dam. It took 4,000 bags of sand to build up the dam and an engine kept busily pumping out the water. In order to get the level for the pipe at the river bottom, it was necessary to lower about 1,000 feet of the line.

In snapshot No. 3 is shown the gang of men as they slowly lowered the pipe into the ditch below the river bed. This was the most difficult feat of all, because the least jar or wrong move might have broken the line, and had a flood come along, it is hard to say what might have happened.

After the line was laid and just before the water was allowed to flow along in its old course, photograph No. 4 was taken. This shows the big stones that were placed above the line. Two hundred wagon loads of these heavy rocks were hauled and dumped and placed above the line. The line was also anchored with twenty heavy river hooks and it is believed that this line will stay put.

It was a big job, and a very necessary one. It was the only thing to do to bring these gas lines up to the high standard necessary for Ohio Fuel service. It was done.

WINNING THE WAR.

DON'T get downhearted if the news about the war happens to be a little unfortunate now and then.

He is a poor patriot who wails and weeps when things go wrong on the Italian front or on the western front.

You don't hear the boys at the training cantonments worrying about the war news.

All they want is the order to go across.

They are awaiting it with anxiety.

They don't pay much attention to the front page headlines in the newspapers.

They are not standing around on the corner wagging their heads and saying it looks bad every time the stock market goes down a point or two.

They are not bemoaning the facts that are brought out in the investigation at Washington.

They are working like blazes every day to become better soldiers, to make up for the deficiency of the people themselves—for in the last analysis the people of this nation are to blame because our boys didn't have the preliminary training that might have enabled us to put a couple of millions of men into the field within a few months after war was declared.

So one of the ways to help do your share if you are not at the front, or getting ready to go to the front is to be an optomist about it.

We are going to win this war.

Perhaps the Teutons are making their last effort on the western front.

They are not going to win.

They may make some headway.

But they are going to be held just the same.

And even if we do have some set-backs, in the end we are going to win.

And when peace does come it is going to be the kind of peace that will stand up under pressure.

It will be a satisfactory peace for the world at large.

Don't get cold feet about the war.

OFFICE ECONOMIES.

DO you use a pencil sharpener in your office, the kind that in two or three seconds puts a perfect point on the pencil, and saves 500% of the time consumed in sharpening a pencil the old-fashioned way?

There is an expression "The good old times," but when we consider what the waste was in those days, versus the speed and convenience of the methods of now, we are astonished to find how we disregarded the value of time in those days. Time although paid for at a much lesser rate per hour, per day, or per year, was waste nevertheless, in proportion with what was paid in dollars and cents, and, so far as time itself is concerned, was precisely as wasteful as in these present days.

Where an office is spread over quite an area, the investment in duplicating speed appliances, like for instance, the pencil sharpener, is putting money where the saving is magnified by hundreds and hundreds of per cent. in a year's time.

Our text, "The Pencil Sharpener," may seem, on the face of it, a bit of a thing about which to write so much. It is not, however. It, i nproportion, has as much to do with winning or losing in the outcome of a business, as that which would, on the face of it, seem the most important thing to be considered in business management.

We are not advertising pencil sharpeners, we are advocating looking after the small leaks in business conduct.

Prizes for Wrinkles

Now is the Time When the Best Way is Important to Every Man — Tell Others What You Have Discovered as the Best Way.

HEAR YE! Hear ye!! Hear ye!!! so used the crier to cry in the streets of the city, before the days of magazines and published daily papers.

[illegible] of the advancement that has come with the advent and growth of the press. Now we are asking [illegible] to tell our readers and so help the Natural Gas Association of America, its officers and members, as well the natural gas men of the country wide. [illegible] the Association will pay in cash prizes, as it [illegible] last year, for the best "Wrinkles." That is to say, the best suggestions covering ways to do things that are needful in the natural gas fields, in the distribution of gas, in gas accounting, in installing gas burning appliances, etc., etc., etc.

[illegible] prizes are of ample [illegible] and are in actual cash.

Sometimes some simple [illegible] a thing is of great value and [illegible]

[illegible] not count anything [illegible] found to be time saving or a short cut [illegible] better than the way [illegible] formerly did the same thing [illegible] the least [illegible]. Send in a word description [illegible] drawing or photograph of the device [illegible] way you have found to be a time saver. Write [illegible] yet sufficiently in detail and at sufficient length to give the readers a clear and full idea of your suggestion.

The wrinkles of past years [illegible] the association members have supplied [illegible] many of them were of much value and helpfulness [illegible] the gas industry. Let others read and see what your experience has taught you. Then you [illegible] benefited by using others' suggestions and [illegible] in return will have done your part [illegible]

[illegible] quick! Let that be the [illegible] quickly, for May is the month of the Natural Gas Association Convention [illegible] that the Wrinkles are needed. [illegible] and get busy and send your contribution [illegible] to W. Ree Brown, Editor Wrinkle Department, Natural Gas Association of America, [illegible] Street, Columbus, Ohio. [illegible] will be held May 22nd and 23rd.

Mr. Alfred I. Drescher is Associate [illegible] Bartlesville, Oklahoma.

[illegible] members [illegible] photographs or drawings of methods [illegible] Mr. Drescher.

The Wrinkle Department is one of the most important in association work. Take part in that work and win a cash prize.

LABOR EMPLOYED, SALES LARGE

--

The idle labor is gradually but systematically being picked up and transferred to points of demand which will probably result in a material reduction in idleness by early spring.

Woolworth & Company's January sales were $[illegible] compared with $[illegible] a year ago.

S. H. Kress Company's January sales were $[illegible] compared with $[illegible] a year ago.

S. S. Kresge Company's January sales were $[illegible] compared with $[illegible] a year ago.

Sears, Roebuck & Company's January sales were $[illegible] compared with $[illegible] a year ago.

[illegible] sales for 1917 were $[illegible] compared with $[illegible] the previous year.

Montgomery Ward & Company announce plans for [illegible] of their Kansas City plant.

FIRST CLASS SHOWING

[illegible] the installment [illegible] business operations [illegible] Association [illegible] orders the [illegible] January was [illegible] and [illegible]

[illegible]

Buy a Baby Bond for Baby

THE NATURAL GAS BUSINESS NEEDS YOUR HELP

—You remember when the "flying machine" was "just some fellow's wrinkle."

—You have heard how nitroglycerine was the product of the simple wrinkle of mixing the high explosive with cotton waste.

—You know the submarine was an American's idea, and that now Henry Ford is making up some other little wrinkles, called Eagles, to sink certain lawless submarines.

—You know that a British chap saw a caterpillar tractor, and his war wrinkle was the famous British tank.

—A Yankee has just gotten up a wrinkle and given it to the government. His is a gun that will shoot over 30,000 shots a minute.

THE KEEN MINDS OF THE FELLOWS WHO THINK AND DO NEW THINGS WILL HELP WIN THE WAR.

"Only a wrinkle," may be the start of many a mighty change

In these days of fixed gas rates and unfixed supply prices, it is vitally necessary that we increase the efficiency of every operation. We expect you to let every other natural gas worker know about your short-cut methods, your new ideas and better plans.

Do Your Duty — Send in Wrinkles

It is your duty to assist the other men of the natural gas industry. See to it that they do not continue to work along old lines, when you know a better way.

Send your "wrinkles" to the wrinkle editors without delay. Please get them in shape and send them at once. If illustrated with drawings, send the original drawings, not blueprints. Write complete descriptions, send photographs, etc., and be sure to give your name, the name of your company and your address. Send all contributions to the editor who is nearest to you, or give them to the man appointed by your company.

SURE THERE WILL BE CASH PRIZES

Ten prizes will be given for the wrinkles judged to be best by members of the association.

1st	$25.00	6th	$5.00
2nd	$20.00	7th	$5.00
3rd	$15.00	8th	$5.00
4th	$10.00	9th	$5.00
5th	$ 5.00	10th	$5.00

NATURAL GAS ASSOCIATION OF AMERICA

W. RE. BROWN
Editor
The Ohio Fuel Supply Co.
Columbus, Ohio.

ALFRED J. DIESCHER
Assistant Editor
Wichita Natural Gas Co.
Bartlesville, Okla.

DO IT TODAY—TOMORROW MAY BE TOO LATE

yore: 'Civus Romanus sum'." (I am a Roman citizen.)

This war will be won not alone by the victories of our soldiers and our sailors but to a very marked degree by the spirit of the soul of the people at home.

I appeal, therefore, to the oil industry to stand as a unit in taking its part in this great conflict. It has no inconspicuous or unimportant part to play. It must furnish products vitally necessary for the triumph of our armies, and it can do this only through the most efficient co-operation and united action.

I pledge the Oil Division to meet with the industry in a spirit of justice and fairness; asking and expecting complete confidence and united support, to the end that when the time shall have come and our returning soldiers and sailors march proudly past in final review we may be able to look them squarely in the eye and say "We, too, have done our part."

A WELCOME LETTER.

UNION FRANÇAISE DES ACÉTYLÉNISTES.

Paris, France, January 10, 1918.

M. Cressy Morrison,
42nd Street Building, New York, U. S. A.,
Secretary International Acetylene Assn.

Dear Sir:—

With our best wishes for 1918, we beg to inform you that we intend offering our services to all our dear members of International Acetylene Association whose parents and friends are required to serve in France in the Allied Armies.

Far from their families, we think they will be happy to know that they will find at the "Office Central de L'Acetylene," 104 Boulevard de Clichy, help and assistance for all they may desire.

We shall not only be happy to welcome them when they are staying or passing in Paris, but we shall be proud to help them, in the correspondence for parcels they may have difficulties to get.

We propose, through your intercession, to be their friends and devoted correspondents here, and to smooth, by all means, the rigor of their present exile. They can, therefore, apply to us in all circumstances. We shall put ourselves entirely at their disposition.

In begging you, please, to inform of our intentions the members of your Association.

We remain, dear sir,

Yours very truly,
PIERRE ROSENBERG.

OPPORTUNITY TO GET LABOR.

In these days when labor is as scarce as "hen's teeth," as the expression goes, it should be acceptable news that one can get gangs of men of 50 or 150 in number by applying for them. An advertisement appears in this number, of a contractor who has the men and will contract to dig ditches for pipe-lines, supplying the necessary men. His service should be a boon to companies having work in prospect.

MACHINE TRADE THIRD LOAN.

LET all of our readers take notice that there is in connection with the Third Liberty Loan, a special Liberty Loan Committee for the Machinery and Machine Tool Trades. In the personnel of this Committee are several with whom our gas trade come in touch. The representation from the Machine Trade is extensive and representative. Those our field knows best are C. Philip Coleman, President Worthington Pump & Machinery Corporation; Augustus Davis, President Davis-Bournonville Company; George Doubleday, President Ingersoll-Rand Company. The Trades should co-operate.

PASTOR SEES LABOR IN CONTROL AFTER WAR.

WE note in one of the New York papers, an item reading as follows:

"The Rev. Dr. John Haynes Holmes, of the Church of the Messiah, Thirty-fourth Street and Park Avenue, told his congregation yesterday that labor will control things after the war."

We hope the Pastor in speaking to his people made a very strong point of *who the working people are*. Without such statement accompanying the assertion on the part of the Pastor, an utterance of that nature is dangerous, since many are sufficiently narrow to interpret this to cover only certain toilers. In reality in this country, there are exceedingly few who are not toilers, and it is always unfortunate to class executive people, outside of the pale of "working people." Such are "workers" just as important as those who work with their hands, as are those who are hand-workers important to the executive, and financial interests.

It would be better to say, after the war, the world when it has settled down to its bearings, is going to be wholly, or in a very large measure, conducted *by the people and* for the people.

It is unwise to intimate or draw dividing lines. Instead thereof, let us try now in advance of the closing of the closing of the war, and after the war has ceased, to unify our nation and our peoples by that wonderfully magnetic and powerful unifier, namely, the words *"for the people, and by the people."* Let us eliminate in every way possible the term and the thought that surrounds the term, namely, the *"working classes,"* and in place thereof let us refer to ourselves and the others of our communities as *"the people,"* those who through unity of purpose, and a unified desire for the best good for the greatest number, stand for a utopia through the unifying of interests, the true essence of socialism, devoid, however, of those things that make the rampant socialist a distasteful, a disturbing and in many instances a dangerous member of a community.

New Heating System

Answering Fuel Needs With a New Heating System.

A

The Third Liberty Loan Mar[illegible] Three Strikes and Out[illegible] the Kaiser

Even where gas-rates are most favorable, the fuel cost is usually higher than coal, therefore a more or less expensive educational campaign is needed to induce people to see the *benefits* in a more expensive fuel. Then, too, the gas-appliances, in a large measure, available, have not been entirely satisfactory for general use.

These reasons are sufficient largely to explain the tardy acceptance of gas for general heating of buildings, yet in spite of them, due much to the energy saw that the heat of the products of combustion in the exhaust pipe might be utilized in a radiator for room, or space-heating. Tests soon showed him that with properly designated radiation, the system would show an efficiency unknown till then and that beyond this gain, some most desirable features of ventilation, valve operation and temperature control would be possible.

For several years Mr. Rector struggled with those obstacles usually met with by the inventor of moderate

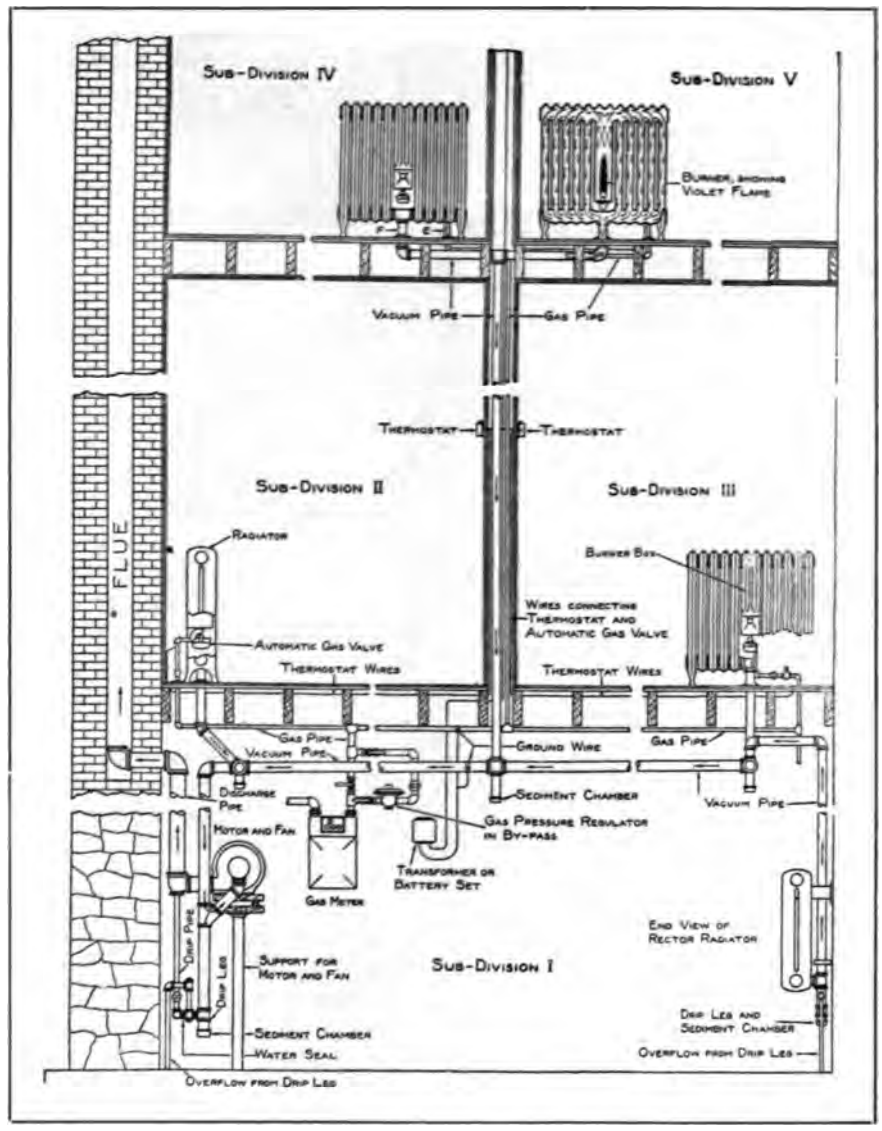

FIG. 1. DIAGRAMMATIC ILLUSTRATION OF THE RECTOR SYSTEM OF GAS HEATING.

of a few manufacturers of heaters, this practice has extended at a gradually increasing rate, till now it is not uncommon in certain localities, or in those buildings for which the appliances now on the market are suitable, to see gas-heating systems in operation.

About 1909, Alcorn Rector, while experimenting with incandescent mantle gas lamps, particularly with the view of increasing the quantity or intensity of the light as well as the efficiency of the lamp, adopted the exhaust instead of the pressure method for augmenting the proportion of primary air in his atmospheric burners. Keen and observant, he immediately means, constantly improving his system by the slow and unsatisfactory means of fault elimination in commercial installations, until about two years ago he formed a connection with a well known company with manufacturing and commercial facilities to properly build, sell and install the system.

The faults of the heating-units and their parts have been overcome and improvements made in them, units of several sizes have been designed, and specifications drawn up for the installation of the radiation, piping, exhaust-fan, etc., for a system of heating primarily adapted for the heating of a building or one large sec-

tion of a building, although it is perfectly practical to install a single radiator.

The Rector system is a distinct departure from any previous plan of heating. Its basic principle is the generation of heat at the exact point where heat is needed, and at the exact time when heat is wanted, with the added feature of positive ventilation. The ventilation, though positive, is not, however, to be considered as sufficient in quantity to meet the requirements of the usual building laws for auditoriums. It is sufficient, however, to make the atmosphere of the ordinary living room noticeably more satisfactory.

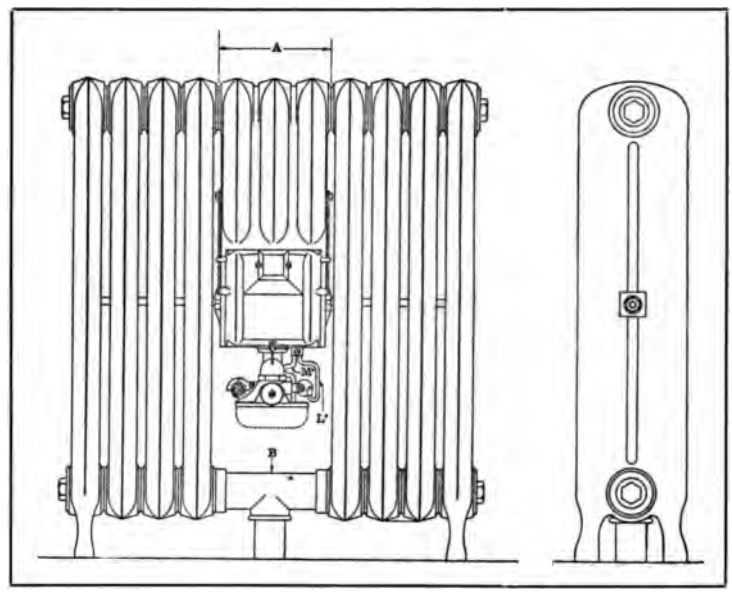

FIG. 2. A TYPICAL RECTOR GAS RADIATOR SHOWING LOCATION OF COMBUSTION CHAMBER.

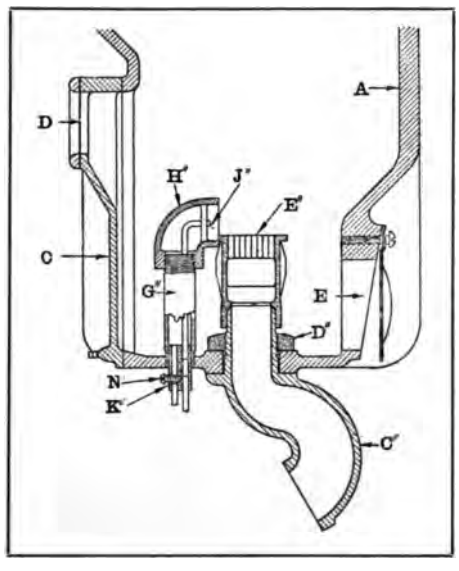

FIG. 3. SECTIONAL VIEW OF LOWER PART OF BURNER BOX.

It is obvious that the cost of artificial gas demands that any apparatus devised to utilize it as a fuel, should positively provide for: (1) perfect combustion, (2) complete utilization of its heat, and (3) proper ventilation. The accomplishment of these three ends is a primary requisite and any apparatus which does not achieve these results will not be largely successful in broadening the use of gas as a heating agent. Further than this, any such apparatus should provide so easy a fuel-supply-control that the fuel may be shut off and its expense eliminated at the instant that a room or group of rooms becomes properly heated, or their occupancy has ceased.

Elementally, the G. F. E. Rector system is a hot air system, heat being obtained by passing the hot products of combustion from the gas burner through the various sections of a metal radiator. The design of the burner box and the radiation are such that practically all of the heat from the products of combustion is radiated into the room before the products are exhausted from the radiator. Where thermostatic control is provided, the fuel supply is operated, not by chance, but by the temperature of the room itself.

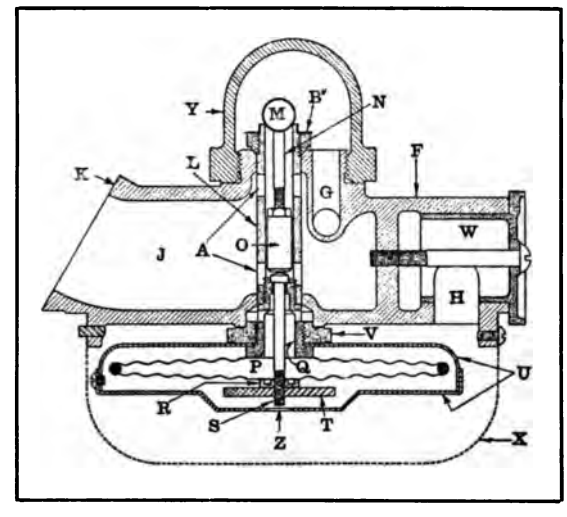

FIG. 4. SECTIONAL VIEW OF THE VALVE SHOWING OPERATING DIAPHRAGM.

In most gas radiators, the products of combustion leave the radiator at a very high temparature and, when a flue is provided, pass through it to the outside air still containing a great deal of heat which should be given up in the room if fuel waste is to be eliminated.

When the appliance is not provided with a flue, all of the heat from the gas is, of course, available for heating the room, but as this heat is largely heat of convection in the products of combustion its actual effect on the comfort of the occupants of the room is not as satisfactory as might be supposed.

Broadly, the Rector system as it is installed, is similar in arrangement to the two-pipe steam heating system, each room being equipped with the number of radiators necessary to suitably heat it. Each radiator has its own individual valve so that it is a complete heating unit. All of the radiators, however, are connected into one vacuum system and the products of combustion, after their heat has been radiated into

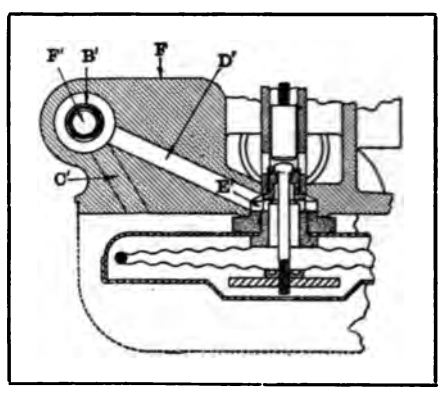

FIG. 5. CONTROL DETAIL OF VALVE FOR CLOSING OFF THE RADIATOR INDEPENDENT OF OTHERS ON SYSTEM.

the room, are drawn through this vacuum piping and expelled out-of-doors by the agency of a small motor-driven suction fan.

For the details of the G. F. E. Rector system, reference may be had to Fig. 1, which illustrates it diagrammatically. Sub-division I shows the details of the basement arrangement from which it will be readily seen that none of the apparatus takes up any large amount of space, thus leaving the cellar entirely free for other uses. The most important part of the basement equipment is the fan, which is interposed at any convenient point in the vacuum line of pipe and unless other power is available this fan is driven by a small direct-connected electric motor. When the fan is running air is drawn through all radiators as each radiator is connected to the vacuum system by the tee between the bottom sections. It is through this system of vacuum pipe that all products of combustion are removed from the radiators and expelled out of doors through the flue as shown.

Several drip legs are necessary because one of the products of gas combustion is water and other sediment from the vacuum piping, so that they will not accumulate and break the vacuum.

The gas piping which supplies the radiator starts from the house side of the gas meter, connections being made to each radiator at V' in the automatic radiator valve, Fig 7. A shut-off is installed in each radiator connection so that the entire radiator may be removed from the system without affecting the balance of the heating plant. The gas pressure regulator shown may, where necessary, be installed in the gas pipe near the meter and it maintains a constant gas pressure at all times regardless of the pressure fluctuations in the city gas main.

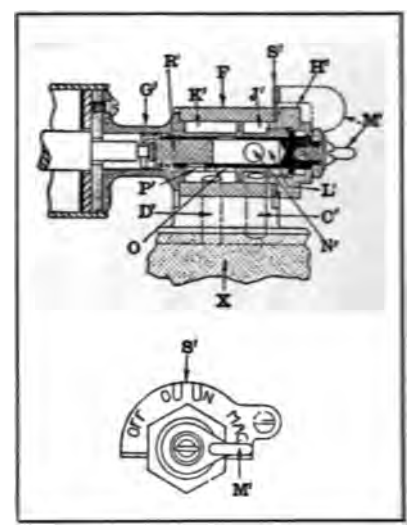

FIG. 6. MECHANISM OF THE VALVE FOR ALTERING FROM HAND TO MAGNETIC CONTROL.

Sub-division II shows an end view of a radiator illustrating how the automatic gas valve is connected to the burner box of the radiator. Here will be noticed the thermostat wiring between the thermostat on the wall and the automatic gas valve of the radiator. This thermostat automatically controls the room temperature by means of a solenoid attached to the automatic radiator valve, the gas being turned *on* when the room temperature is lower than the temperature indicated on the thermostat dial and *off*

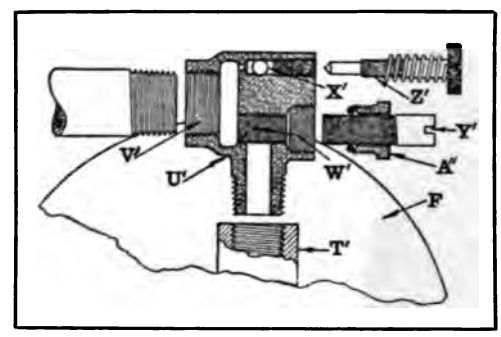

FIG. 7. DETAILS OF THE GAS CONTROL MECHANISM.

when the room temperature is higher than the temperature indicated. The thermostat circuits are operated at a low voltage (10 to 14 volts).

Sub-division III shows a part section through the individual radiator. When the gas cock is opened, a very small part of the gas admitted feeds directly into the little pilot in the burner box. The pilot is lighted by opening the burner box door and inserting a match just as any ordinary gas burner would be

lighted. The pilot light gives off a very small amount of heat and consumes a nominal amount of gas. Once it is lighted, it is usually left burning throughout the entire heating season. Its sole purpose is to ignite the gas in the main burner when it is admitted by the operation of the automatic gas valve.

In Sub-division V a cross section of the radiator is diagrammatically shown illustrating the violet flame in the burner. The little arrows show how the products of combustion and all the heated gases are circulated through the radiator until practically all of their heat has been delivered into the room. After the gases have been cooled practically to room temperature, they are drawn into the exhaust as shown by the arrows, taken through the vacuum system and expelled out of doors through the flue.

Fig. 2 shows the G. F. E. Rector radiator which is similar to the common direct hot water or steam type radiator with the central sections removed and the gas combustion chamber A inserted in the place. This combustion chamber is connected to the top of the radiator sections only. The tee B of the same width as the combustion chamber is inserted in the bottom sections to couple them together and provide a connection to the vacuum system. Heat is generated by burning gas in the combustion chamber of the radiator and by means of the suction fan, the hot products of combustion are drawn throughout all sections of the radiator which is so proportioned that by the time they reach the exhaust pipe they have given up practically all of their heat.

Further details of the combustion chamber are shown in Fig. 3 which is a sectional view of the lower part of the burner box A in the front of which is the door C for access to the burners, etc. This door is provided with a mica window D so that the flame may be observed without opening the door.

In the back of the box is an air inlet E provided with a flap. This flap is so constructed that it hangs open except when the fan is runnnig and through it air is supplied to the pilot flame. When the fan is in operation the suction pulls the flap to its seat, thus preventing any admission of air except through the burners. A similar flap is placed at the top of the burner box to permit the escape of the products of combustion from the small pilot burner when the fan is not in operation.

Fig. 3 also shows the position of the main and pilot burners in the burner box or combustion chamber. Through an opening in the bottom of the burner box the mixing tube C″ projects and is fastened in place by the valve flange nut D″. The lower end of the mixing tube is attached to the automatic valve body at K Fig. 4) by stud bolts. The main burner E″ fits loosely on the upper end of the mixing tube and consists of a body of cast brass with alternate strips of plain and corrugated brass held in the body by brass end clamps. The burner orifices are formed by the spaces between the plain and corrugated strips which are so designed that they effectually prevent "flashing back" and at the same time readily permit cleaning, if necessary.

The pilot burner is the result of long and careful experiment under all conditions and consists of several parts so designed as to be simple and rugged. A nipple or tube of iron pipe G″ screws into the bottom of the burner box. On top of this tube is the pilot body H″ which serves as a shield for the pilot flame which burns from the end of the pilot tube J″. In the lower end of the nipple is a plug K″ with two holes which serve as gas and air passages. The pilot tube enters the top of the gas passage and the pilot connecting tube (shown at L″, Fig. 2) enters the bottom. The upper end of the air passage is open and the lower end receives the air connecting tube (M″, Fig. 2). In this passage is an air regulating screw N″. These connecting tubes are attached to the gas control body U′ and the interior of the automatic valve body F (Fig. 7) by slip joints at their lower ends. The gas for the pilot is regulated by the pilot screw Z′ (Fig. 7) and the air needed by the pilot for perfect combustion is regulated by the screw N″.

The present automatic gas valve of the G. F. E. Rector system is so radically different from any other valve previously used for this purpose that a somewhat detailed description of it is warranted. The functions of this valve have already been indicated and Figs. 4, 5, 6, and 7 show in section its operating mechanism.

The valve consists of the body F, Fig. 4, made from a special mixture of cast iron, which contains the gas inlet G, the air inlet H, and the gas and air mixing chamber J. The mixing chamber J is connected to the gas burner by means of stud bolts at the ground surface K. Axially supported in the body is the valve tube L. The valve proper consists of the bronze ball M, with its stem N, and weight O. The ball valve M seats on the upper end of the tube L and normally is kept closed by the weight of M, N and O.

Also axially supported from the body is the corrugated bronze diaphragm P to which is soldered the diaphragm spud Q. On the lower part of the diaphragm is soldered the boss R, which is threaded to receive the diaphragm spindle S. This spindle also carries the diaphragm weight T. The diaphragm is enclosed in the diaphragm case U, which is made in two parts. The position of the diaphragm case in relation to the body is maintained by means of the diaphragm spud nut V.

The quantity of air admitted through the air inlet H is controlled by means of the brass air regulator W, which is held in place by means of a screw, threaded into a bridge of the valve body. The air strainer X is a finely perforated brass screen, which is attached to the valve body by screws and which may be removed for cleaning or for inspection of the valve. On top of the valve body is the cast iron valve cap Y which makes a gas tight chamber around the ball valve.

In Fig. 4, the parts are shown in the normal position, the gas valve being closed and the ball resting on its seat. As soon as the exhaust fan starts there is a vacuum or negative pressure created throughout the exhaust piping, the radiators and down through

the burner into the mixing chamber J. This negative pressure extends down through the diaphragm spud nut Q and inside of the diaphragm P. As the outside of the diaphragm is subject to atmospheric pressure which enters through the hole Z, in the bottom of the diaphragm case U, the lower part of the diaphragm moves upwards raising the diaphragm spindle S so that it comes in contact with the valve weight O, lifting the ball valve M from its seat and allowing gas to pass from the gas inlet G down through the interior of the valve tube L and out through the holes A into the mixing chamber J. Simultaneously air is drawn in through the air inlet H and the interior of the valve body to the mixing chamber J. Here it mixes with the gas which has already entered and the mixture passes to the burner.

If the exhaust ceases there is nothing to hold the lower part of the diaphragm in its raised position and the counteracting weight T causes the diaphragm to move back to its normal position, permitting the weight O to pull the diaphragm valve M securely against its seat thus putting off the gas.

Fig. 5 illustrates the control of several radiators on the same line when it is desirable to close one of them while the exhaust is still operating. In the valve body F there is a passage B′ from which lead two other passages, the first C′ giving direct connection with the atmosphere at a point just above the diaphragm case U but inside of the screen X.

The second passage D′ gives communication from the passage B′ to the opening E′ in the diaphragm spud Q. A plug valve F′ is provided in the passage B′ which normally closes communication between the passages C′ and D′. When one radiator is not to be operated the plug valve is turned so that there will be communication through the passages C′ and D′ and the opening E′ through the spud Q to the interior of the diaphragm P. Consequently atmospheric pressure is exerted both on the inside and the outside of the diaphragm. Therefore there will be no tendency for the lower part of the diaphragm to rise and the gas valve will remain closed. This plug valve may be controlled either by hand or by a thermostat, as later described.

The constant inflow of air through the valve when the blower is in operation might cause dust to collect in the valve passages and the purpose of the screen X (Fig. 4) is to prevent this, all of the air entering any part of the apparatus being drawn through this screen, which is easily cleaned without removal, although easy removal is provided for.

While a simple plug valve may be used at F′, Fig. 5, experience has shown the desirability of a control which is more universal in character. This is illustrated in Fig. 6. The valve body G′ has a base for holding a solenoid at the back and threaded in front for the cap nut H′. In the valve body are two annular channels J′ and K′, communicating respectively with the passages C′ and D′, and the axial passage into which fits the sleeve L′ a thin cylinder open at the back and carrying at the front the handle M′ fastened to the sleeve by means of a screw. Communication between the channels J′ and K′ is obtained by the holes N′, O′ and P′—when the sleeve L′ is turned to certain positions. R′ is a cylindrical plunger actuated by the armature of the solenoid. A dial or indicator plate S′ shows the various operating positions of the parts.

When magnet control is to be employed the handle M′ is turned to the position shown bringing the hole N′ so that there is, at all times, communication between the atmosphere through the passage C′ and the interior of the sleeve. With the plunger R′ in the position shown the passage P′ is closed so that the diaphragm is only subject to the pressure caused by the fan. If the armature of the solenoid to the left (in the illustration) it will pull the plunger to the left uncovering the hole P′ permitting atmospheric pressure to pass from the interior of the screen X through C′, N′, P′ and D′ to the interior of the diaphragm so that the latter is not affected by the suction of the fan. The magnet, therefore, does not directly operate the valve, but simply controls the air passages, breaking the vacuum, thus allowing the valve to close.

When hand control is desired the solenoid is dispensed with, the hole in the back of the body being plugged. Control of the vacuum is then obtained by revolving the sleeve L′ by means of the handle M′ to a position as indicated on the dial plate. By this means communication between the holes N′ and O′ is opened or closed and the diaphragm is affected as in the case of magnet control.

If simultaneous magnetic and hand control is desired the parts are left as shown in Fig. 6 when either the plunger R′ is moved by the solenoid or the sleeve L′ is turned by hand, but in this case the handle M′ must be put in the position M A G when the magnet is to operate. Current to the solenoid may be controlled by means of a switch or thermostat.

Fig. 7 shows the details of the gas control. On the valve body F is a boss T′ into which is screwed the brass gas and pilot body U′, which is tapped for the gas connection at V′. In the front of the body U′ are two passages W′ and X′, W′ for the gas to the main burner, the quantity of gas being controlled by means of the screw Y′, which is made gas tight by means of the stuffing nut A″ and a gasket. The pilot screw Z′ for regulating the gas to the pilot burner is placed in the passage X′, and held in adjustment by means of a spring.

Ready accessibility to all parts is obtained by removing the air screen X, the valve body cap Y and the valve nut B″, Fig. 4. When these are removed all of the working parts of the valve, with the diaphragm, may be removed as a unit. The diaphragm may be examined or adjusted by opening the diaphragm case by removing the screws which hold the two parts together.

As the temperature of the burner box is somewhat higher than in the common steam or hot water radiator it is at times desirable to provide a guard to prevent contact with the hot parts of the radiator. There are many satisfactory kinds of such guards but

one has been adopted as a standard with which all radiators are equipped, unless some other is specified. This guard is of heavy sheet steel perforated in a diamond pattern and consists of two parts: the guard, or top, curved to conform to the top of the radiator and the apron which depends from the guard and protects, not only the burner box but the valve and other working parts.

The guard is rigidly attached to the radiator by brackets which screw into the tapped holes in the tops of the sections and the apron is so attached to the guard that it may be easily swung aside to give access to the burner box or valve. The guard also carries a protecting shield above and behind the radiator, the shield being designed to increase materially the circulation of air over the hottest part of the radiator.

From this description it will be evident that there are several distinct and desirable heating conveniences with the G. F. E. Rector gas heating system:

1. It gives exactly the amount of heat just when and where wanted;
2. It gives nearly 100 per cent heating value from the fuel used;
3. When equipped with thermostatic control it gives an even, non-fluctuating temperature, no matter how sharp and sudden the outside temperature changes;
4. It requires the minimum of attention and, aside from minor adjustments in its mechanism, can be run as readily by a woman as by a man;
5. It is absolutely odorless, absolutely dustless and absolutely healthful;
6. It leaves the cellar just as clean as the other rooms of a building, because it does away with coal, ashes and all the dirt and dust incident to the operation of the usual coal-fired furnace or boiler;
7. It serves also as a partial ventilating system in that it constantly renews the fresh air throughout a building because it expels the vitiated air.

It can well be seen that this system is very elastic and the desirability of such heating elasticity is obvious as applied to dwellings where certain rooms are used infrequently but where heat must be quickly obtainable when needed. The advantage of such elasticity in heating as applied to business buildings is not so readily evident, but in such cases the janitor or engineer is enabled to give an adjustment of different temperatures in various sections of the building.

Editor's Note:—From the foregoing description it is clear that this system differs fundamentally from practically all other gas-heating appliances. It is preeminently a gas heating *system*, embodying local gas-heat-producing units, while generally other gas appliances are heating *units*, not in series or otherwise a part of a system; except, of course, where gas is used for fuel in a central heating plant. There is a great field, and will always be a great field, for heating appliances of the single unit type, but the *system* just described is certainly unique in that it is a type of gas heating appliance on the locally controlled series principle, consistently and scientifically developed, not as a heating unit, but as has been said, a complete heating system embodying *as well*, localized-units advantages.

ANSWERING AN INQUIRY.

Editor Natural Gas and Gasoline Journal,
Buffalo, N. Y.
Dear Sir:—

Can you inform us regarding the natural gas produced and distributed during the year past in West Virginia, and can you give us what shrinkage there was in the manufacture of carbon?

Yours very truly,
A SUBSCRIBER.

Our reply was to the effect that the subscriber might expect an answer to his query in the March issue of NATURAL GAS AND GASOLINE JOURNAL.

As a reply to the request, we publish the comparative statement made for the period covered by the years ending respectively September 30th, 1916, June 30th, 1917.

All amounts are in cubic feet.

Utilities produced	226,618,602,000
Estimated for missing reports	2,730,393,000
Total gas produced by utilities	229,348,995,000
Others produced—not utilities	39,618,510,000
Estimated for missing reports	477,340,000
Total produced by others—not utilities	40,095,850,000
Total produced—reported	266,237,112,000
Estimated for missing reports	3,207,733,000
Total produced	269,444,845,000
Less amount reported used for carbon black	9,627,826,000
Total Produced for Domestic and Industrial Distribution	259,817,019,000
Gas consumed, Domestic and Industrial	53,970,674,000
Estimated for missing reports	2,406,653,000
Total consumed—Domestic and Industrial (Carbon black not included)	56,377,327,000
Gas consumed—Domestic and Industrial (Carbon black not included)	56,377,327,000
Gas consumed—Field and Main Lines	17,964,726,000
Estimated for missing reports	801,080,000
Total consumed—Field and Main Lines (Carbon black not included)	18,765,806,000
Gas consumed—reported	71,935,400,000
Estimated for missing reports	3,207,733,000
Total gas consumed (Carbon black not included)	75,143,133,000
Gas exported out of State	188,169,235,000
Gas imported into State	2,810,684,000
Gas reported used for Carbon black (a)	9,627,826,000

(a) It is estimated that about 19,000,000,000 was used for this purpose.

Save More Lives—Buy More Bonds.

Natural Gas Production and Distribution in West Virginia for the Year Ending June 30, 1917.

All amounts are in cubic feet.

Utilities produced	252,749,340,000
Others produced	38,751,444,000
Total production	291,501,784,000
Less amounts reported used for Carbon black	10,919,084,000
Total production for Domestic and Industrial Distribution	280,582,700,000
Gas consumed—Domestic and Industrial	50,729,000,000
Gas consumed—Field and Main Lines	23,449,943,000
Total gas consumed (Carbon black not included)	74,178,943,000
Gas exported out of State	210,321,226,000
Gas imported into State	3,278,087,000
Gas reported used for Carbon black (b)	10,919,084,000

(b) It is estimated that about 20,000,000,000 was used for this purpose.

Utilities produced 1916	229,348,995,000		
Utilities produced 1917	252,749,340,000	10.2 %	increase 1917
		23,400,345,000	
Others produced 1916	40,095,850,000		
Others produced 1917	38,751,444,000	3.35%	decrease 1917
		1,344,406,000	
Total produced 1916 (carbon black reported included)	269,444,845,000		
Total produced 1917	291,501,784,000	8.19%	increase 1917
		22,056,939,000	
Total produced 1916 (carbon black reported not included)	259,817,019,000		
Total produced 1917	280,582,700,000	11.84%	increase 1917
		30,765,681,000	
Gas consumed—domestic and industrial 1916	56,377,327,000		
Gas consumed—domestic and industrial 1917	50,727,000,000	10.02%	decrease 1917
		5,650,327,000	
Gas consumed Field and Main Lines 1916	18,765,806,000		
Gas consumed Field and Main Lines 1917	23,449,943,000	24.96%	increase 1917
		4,684,137,000	
Total consumed 1916 (carbon black not reported included)	75,143,133,000		
Total consumed 1917	74,178,943,000	1.28%	decrease 1917
		964,190,000	
Total consumed 1916 (carbon black reported included)	84,770,959,000		
Total consumed 1917	85,098,027,000	.38%	increase 1917
		327,068,000	
Gas exported out of State 1916	188,169,235,000		
Gas exported out of State 1917	210,321,226,000	11.77%	increase 1917
		22,151,991,000	
Gas imported into State 1916	2,810,684,000		
Gas imported into State 1917	3,278,087,000	16.63%	increase 1917
		467,403,000	
Amount reported used for carbon black (c) 1916	9,627,826,000		
Amount reported used for carbon black (c) 1917	10,919,084,000		
		1,291,258,000	

(c) It is to be noted that reports for all the gas used for this purpose are not available.

READY-TO-SERVE CHARGE.

THE city of Toledo has done the square thing by the Northwestern Ohio Natural Gas Company of that city, in allowing a ready-to-serve charge of 35 cents per month per consumer. This granting of the privilege has resulted in other cities or communities doing likewise. For instance, North Baltimore, Bowling Green, Maumee, and Perrysburg have fallen in line, the Public Service Commission promptly approving the act.

The following are stated as the reasons for this move:

"The overhead cost per meter for labor, repairs, bookkeeping, collecting, taxes, compressing and delivering gas is 65 cents per month, which is exclusive of the cost of gas.

"It was found on investigating the matter that 3,900 families used an average of 1,900 feet of gas per month and paid 35 cents per month for twelve months in the year. Therefore the company was furnishing them with 1,000 feet of gas per month free, and giving them 30 cents per month for the privilege of having them as consumers.

"About 6,300 families paid 70 cents per month for each month in the year, and they received 2,000 feet of gas per month for this, and they were therefore getting their gas for 2½ cents per thousand; 6,100 families paid $1.05 each month, for which they received 3,000 feet of gas, which netted the company a trifle over 13 cents per thousand feet.

"About 5,000 families paid $1.40 per month, for which they received 4,000 feet of gas, and which netted the company about 19 cents per thousand.

"Inasmuch as the gas costs the company in the field, hundreds of miles from Toledo, more per thousand than these consumers pay for it, it can very readily be seen that they are really a detriment to the company.

Raising the price of gas would not remedy this condition, as the discrimination would still exist—hence the ready-to-serve charge, which it is hoped will produce sufficient revenue to meet the increased expenses, and help to make a fair return upon the valuation of the property devoted to the transportation and distribution of natural gas."

RESULTS OF DRILLING---LATEST REPORTS

PENNSYLVANIA FIELD.

ALLEGANY FIELD.

Jordan, E. J. Wilson	Gas

VENANGO-CLARION.

J. S. Stover, S. P. McCalmont et al 3	Dry
Winkleman, S. P. O. M. D. 2	Dry
Clarion County—	
Buzza, J. N. Buzza et al 4	Gas
Forest County—	
Coleman Fraer, Jefferson O. & G. 4	Gas
Dry	2
Gas	2

BUTLER-ARMSTRONG.

Abrams, Abrams 1	Dry
Mangel, N. Mangel 2	Dry
Dry	2

SOUTHWEST PENNSYLVANIA.

Washington—	
Ritchie, Peoples Gas 1	Gas
Y. & O. Coal, Y. & O. Coal 1	Dry
Aiken-Leech, So. P. O. M. D. 1	Gas
Day, Mfrs. L. & H. 1	Dry
Craft hrs., W. Va. N. G. 2	Gas
Dorseyville—	
Miller, Amer. N. G. 1	Gas
Ingomar—M. M. Walley, M. M. Walley & Co. 3	Dry
Mt. Morris—	
Kigler, Philadelphia Co. 1	Dry
Mackey, Mfrs. L. & H. 1	Gas
Greggs, Mfrs. L. & H. 2	Gas
Clutter, N. G. Co. of W. Va. 1	Gas
Lawrence Co.—	
Hefnee, Campbell & Jackson 2	Gas
Dry	4
Gas	8

WEST VIRGINIA.

Mannington—	
Strum, So. P. O. 1	Gas
Satterfield, Blackshere O. & G. 3	Dry
Hibbs, Mfrs. L. & H. 3	Dry
Maxwell, Philadelphia Co. 3	Gas
Cox, Hope Gas 2	Gas
Keck, Pgh. & W. Va. Gas 1	Gas
Neptune, Pgh. & W. Va. Gas 1	Dry
Moore, Carnegie Gas 2	Dry
Hamilton, Hope Gas 6	Gas
Ashcraft, Mfrs. L. & H. 1	Gas
Glover, Philadelphia Co. 1	Dry
Thomas, Hope Gas 5	Gas
Wetzel and Tyler—	
Pendergast, Carnegie Gas 2	Gas
Fuchs, Mfrs. L. & H. 1	Gas
Brookover, Hope Gas 3	Gas
Shrader, Max Fudner & Co., 1	Dry
Marshall Co.—	
Dorsey, Mfrs. L. & H. 1	Gas
Rhine, Mfrs. L. & H. 1	Gas
McGlumphry, Mfrs. L. & H. 1	Gas
Fair, Carnegie Gas 3	Gas
Sisterville—Williamson, Adams Oil 4	Dry
Ritchie Co.—	
Kelly hrs., Hope Gas 1	Gas
Gilmer Co.—	
Wilson, Hope Gas 4	Gas
Freeman, Eastern Pet. 6	Gas
Calhoun Co.—	
Bell, Hope Gas 1—	Gas
Roane Co.—	
Taylor, O. F. S. 7	Dry
Kanawha Co.—	
Bowers, K. V. Prods 8	Gas
Marmott Coal, Libby-Owens Glass 4	Gas
Moore, G. L. Cabot 1	Gas
Clay Co.—Baxter hrs., U. F. G. 1	Dry
Dry	9
Gas	21

SOUTHEASTERN OHIO.

Woodsfield—	
Ellis, Ellis & Cunningham 1	Dry
Block, J. M. Lofland & Co. 2	Dry
Hocking Co.—	
Reinscheld, Carter Oil 1	Dry
Door Run Coal, Cochran, Funk & Co. 1	Dry
Licking Co.—	
Humphrey, Planet Oil 1	Dry
Fossett, Geo. Guthrie & Co. 2	Dry
McLaughlin, McLaughlin Bros. 4	Dry
Wickham, Whitehill & Co. 2	Dry
Holmes Co.—	
Reece, Logan Nat. Gas 2	Gas
Athens Co.—	
Reuter, Meyers O. & G. 7, 8, 9	Dry
Morgan Co.—	
Penrose, Mosier & Co. 2	Dry
Smith, Henne Oil 39	Dry
Marietta—	
Dennis, Carner & Edwards 1	Dry
Farnsworth, J. H. Jiggins & Co. 3	Dry
Reuenhausen, Reuenhausen & Co. 2	Dry
Reynolds, Jeanette Oil 1	Dry
Carroll Co.—	
O. & U. Coal Co., Scott O. & G. 3	Dry
Dry	18
Gas	1

PENNSYLVANIA FIELDS.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry	Gas
Allegany	4	5	0	1
Bradford Field	9	28	0	0
Middle Field	13	22	0	0
Venango-Clarion	22	87	2	2
Butler-Armstrong	7	10	2	0
S. W. Pennsylvania	24	112	5	8
West Virginia	67	987	9	18
S. E. Ohio	53	755	18	1
Total	199	1,956	36	30

CENTRAL OHIO.

ASHLAND COUNTY.

Mohican—W. F. Haire, Ohio Fuel Sup. 1	Dry

MEDINA COUNTY.

Brunswick—Bental, Medina G. & F. 1	Gas
J. H. Fordham, Medina G. & F. 3	Gas

Wm. M. Strong, Ohio Fuel Supply 1 ..... Gas
Medina—Jno. Kennedy, Medina G. & F. 3 ..... Gas
Lafayette —Carrigan, Medina G. & F. 2 ..... Gas
Jno. O. Lance, Medina G. & F. 1 ..... Gas

Gas 6

LORAIN COUNTY.

Grafton—R. L. Sears, Ohio Fuel Supply 1 ..... Gas
Columbia—Fannie Posts, East Ohio Gas 1 ..... Dry

WAYNE COUNTY.

Wooster—Walter Smith, Ohio Oil 1 ..... Dry
Cannan—Heim-Irwin, Logan G. & F. 1 ..... Gas
C. Talley, Ohio Fuel Supply 1 ..... Gas
G. A. Smith, Ohio Fuel Supply 1 ..... Gas
Wayne—McDaniel, Logan G. & F. 1 ..... Gas
Clinton—Williamson, East Ohio Gas 1 ..... Gas
J. & B. Lake, East Ohio Gas 2 ..... Gas
Chippewa—Galehouse, East Ohio Gas 1 ..... Gas
East Union—Craven, Chas. Curry & Co. 2 ..... Dry

Dry 2
Gas 7

RICHLAND COUNTY.

Monroe—Wigton, Richland Land Dev. 2 ..... Gas
Worthington—Mowery, Logan Gas & F. 1 ..... Gas

Gas 2

CUYAHOGA COUNTY.

Dover—F. Malke, Logan Gas & Fuel 1 ..... Gas
M. E. Wolfe, Logan Gas & Fuel 2 ..... Gas
B. L. Hart, Logan Gas & Fuel 1 ..... Gas
J. D. Kurdtz, Preston Oil 1 ..... Gas
Reed, Melrose Oil & Gas 1 ..... Gas
B. L. Smith, East Ohio Gas 1 ..... Dry

Dry 1
Gas 5

VINTON COUNTY.

Richland—Thatcher, Ohio Fuel Supply 2 ..... Gas
C. E. Wyatt, Ohio Fuel Supply 1 ..... Gas
Eugene Stock, Ohio Fuel Supply 1 ..... Gas

Gas 3

PERRY COUNTY.

Thorn—E. Fink, Logan Gas & Fuel 1 ..... Gas

HOCKING COUNTY.

Benton—Thompson, Ohio Fuel Supply 1 ..... Gas

HOLMES COUNTY.

Ripley—S. E. Everhart, Ohio Fuel Sup. 1 ..... Gas
Ida Rose, Medina G. & F. 1 ..... Gas

Gas 2

COSHOCTON COUNTY.

Tiverton—W. L. Reese, Logan G. & F. 2 ..... Gas

CENTRAL OHIO FIELDS.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry	Gas
Licking	0	0	0	0
Fairfield	0	0	0	0
Knox	0	0	0	0
Ashland	1	0	1	0
Medina	7	35	0	6
Lorain	2	0	1	1
Wayne	9	0	2	7
Richland	2	0	0	2
Cuyahoga	6	0	1	5
Vinton	3	0	0	3
Perry	1	0	0	1
Hocking	1	0	1	1
Holmes	3	40	0	2
Coshocton	1	0	0	1
Jackson	0	0	0	0
Total	36	75	5	29

INDIANA FIELD.

JAY COUNTY.

Penn—J. M. Gardner, J. E. Gardner 2 ..... Dry

PIKE COUNTY.

Patoka—Jane Fettinger, A. B. Bement 1 ..... Gas

SULLIVAN COUNTY.

Turman—W. C. Riggs, Scott & Welman 1 ..... Dry
J. S. Bottsoff, Wm. C. Kennedy Co. 1 ..... Dry
J. Freeman, Gambill & Bement 1 ..... Dry

Dry 3

KENTUCKY-TENNESSEE.

WAYNE COUNTY.

Denney—Steele hrs., Beaver Oil 5 ..... Dry
L. Corder, Crown Oil & Gas 2 ..... Dry

Dry 2

WOLFE COUNTY.

Campton—Jeff Wells, Mason & Dixon 1 ..... Dry
Whiteman—Volley Profit, Sun Co. 1 ..... Dry
Torrent—Spencer hrs., P. J. White & Co. 3 ..... Dry

Dry 3

MORGAN COUNTY.

Cannel City—Geo. Elliott, Lenox Oil & Gas 1 ..... Dry

ESTILL COUNTY.

Irvine—Dave Patrick, Kentucky Pet. 10 ..... Dry
Chas. Cox. Crown Oil 1 ..... Dry
Laban Parks, F. H. Yates 4 ..... Dry

Dry 3

POWELL COUNTY.

Pilot—J. M. Ashley, Pat. J White 48 ..... Dry
J. T. Rogers, Ohio Oil 5 ..... Dry
Meadow hrs., Henry Clay Oil 1 ..... Dry

Dry 3

LEE COUNTY.

Beattyville—J. C. Brandeberry, Atlantic Prod. & R. 1 Dry

BATH COUNTY.

Olympia—Richardson, Yates & Co. 1 ..... Dry

FLOYD COUNTY.

Beaver Creek—S. Gray, Eastern Gulf Oil 1 ..... Gas

WHITLEY COUNTY.

Williamsburg—Kentucky River, Kentucky Mountain Oil 1 ..... Dry

LAUREL COUNTY.

London—Jackson hrs., Atlantic P. & R. 1 ..... Dry
Fuel, Jackson & Co. 1 ..... Dry
D. Brose, Laurel Oil & Gas 1 ..... Dry

Dry 3

CLAY COUNTY.

Manchester—Babtist Land, Farmer & Kennedy 1 ... Gas
Oneida, Cherry & Co. 1 ..... Gas

Gas 2

WARREN COUNTY.

Bowling Green—F. Gerard, Fynn & Co. 1..... Dry
W. Garrison, National Oil 1..... Dry

Dry 2

BREATHITT COUNTY.

Copes Branch—Breck Crawford, Atlantic Prod. & Refg. 1 ..... Gas

MADISON COUNTY.

Red House—McKinney, Parks & Bunch 1..... Dry

LARUE COUNTY.

Upton—Jno. Burke, Dundee Pet. 1..... Dry

LEWIS COUNTY.

Petersville—Tri-State Drilling 1..... Dry

TENNESSEE.

MACON COUNTY.

Salt Lick—D. B. White, N. Haskell 1..... Dry

KENTUCKY-TENNESSEE.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry	Gas
Wayne	3	10	2	0
Wolfe	8	55	3	0
Morgan	4	45	1	0
Estill	13	110	3	0
Powell	23	750	3	0
Lee	20	645	1	0
Bath	1	0	1	0
Allen	9	250	0	0
Floyd	1	0	0	1
Whitley	1	0	1	0
Rockcastle	1	10	0	0
Knox	1	5	1	0
Laurel	3	0	3	0
Clay	2	0	0	2
Magoffin	2	5	0	0
Warren	3	10	2	0
Barren	2	30	0	0
Breathitt	2	5	0	1
Madison	1	0	1	0
LaRue	1	0	1	0
Lewis	1	0	1	0
Tennessee	2	0	2	0
Total	104	1,930	26	4

ILLINOIS FIELD.

CRAWFORD COUNTY.

Honey Creek—Bert Wesley, Phipps & Co. 5..... Gas

WABASH COUNTY.

Friendsville—Couch, Sparks & Co. 1..... Dry

ILLINOIS FIELD.

SUMMARY OF COMPLETED WORK.

	February, 1918.			January, 1918.		
	Comp.	Prod.	Dry	Comp.	Prod.	Dry
Clark	0	0	0	3	95	0
Crawford	3	6	1	4	18	2
Lawrence	0	0	0	2	80	0
Clinton	0	0	0	1	0	1
Wabash	1	0	1	2	50	1
Edgar	1	5	0	0	0	0
McDonough	0	0	0	1	5	0
Total	5	11	2	13	248	4

KANSAS.

BUTLER COUNTY.

26-26-5, Sluss, Patton & Huston 1..... Dry
29-28-4, Love, Empire Gas & Fuel 19..... Gas
7-29-4, Holcomb, Hoyt et al 1..... Dry
28-26-5, Hegberg, Empire Gas & Fuel 58..... Dry
31-25-5, Robinson, Sinclair Oil & Gas 69..... Dry
9-26-4, Town lot, Wichita Crude Oil 1..... Dry
4-29-4, Minor, Mid-Kansas Oil & Gas 13..... Dry
13-27-6, Stebbins, Mollhyde Oil 1..... Dry
7-29-4, Holcomb, Hoyt et al 2..... Dry
29-28-4, Love, Empire Gas & Fuel 19..... Gas
13-29-3, Piper, Lucky Eight Oil & Gas 2..... Gas
16-27-4, Scully, P. O. & G. 18..... Dry
12-28-3, Joseph, Seven Fields Oil 1..... Dry
21-27-4, Lines, Big Seven Oil 2..... Dry
15-27-4, Loomis, Carter Oil 9..... Gas
8-27-4, Jones, Monarch Oil 1..... Dry
33-25-5, Stokes, Empire Gas & Fuel 59..... Dry
36-25-4, Houston, Empire Gas & Fuel 27..... Dry
17-25-5, Robinson, Southwestern Pet. 1..... Dry
2-28-4, Martin, Empire Gas & Fuel 8..... Gas
23-26-4, Boucher, Dynamo Petroleum 1..... Dry

Gas 5
Dry 17
Gas production 6,000,000

WILSON COUNTY.

9-30-15, Hill, Fredonia Gas 1..... Gas
28-27-16, Colaw, Anthony Syndicate..... Gas
8-29-16, Watson, Merchants Oil & Gas 1..... Gas
33-28-18, Albert, Moore Bros. & Troy 5..... Dry

Gas 3
Dry 1
Gas production 8,000,000

MONTGOMERY COUNTY.

32-34-14, Wylie, Heaton Oil &Refining 2..... Gas
3-34-15, Pugh, C. E. Roth 2..... Gas

Gas 2
Gas production 1,000,000

CHAUTAUQUA COUNTY.

Sedan—
11-34-11, Trout, Crook et al 3..... Dry
1-32-12, French, Guy Berry 6..... Gas
9-32-13, Thorp, Bernadine Oil 1..... Dry
Elk—
21-31-12, Hogan, Bliss & Co. 3..... Gas
24-30-12, Clark, Sachem Oil 1..... Dry

Gas 2
Dry 3
Gas production 2,000,000

MIAMI-FRANKLIN-DOUGLAS.

Wellsville—
36-16-21, Downs, Hirsh 1..... Dry
27-17-21, Gaylor, Ray Oil 2..... Dry
15-17-21, Freeman, Kan. Duluth O. & G. 5..... Dry
13-16-20, Lister, Wellington Wellsville O. & G. 4.... Gas
13-14-21, Rodewald, Kansas Natl. Gas 2..... Gas
13-16-20, Lister, Wellington-Wellsville 4..... Gas
10-16-20, Kyle, McWells Co. 3..... Gas
10-16-20, Kyle, McWells Co. 2..... Gas
20-16-21, Axline, Unnamed parties 1..... Dry
24-16-21, Love, Unnamed parties 1..... Dry
13-16-21, Shields, Gossett et al 1..... Dry
14-12-21, Cone, Home Oil & Gas 2..... Dry
Rantoul—
31-17-22, Cress, I. N. Miller 3..... Dry
11-17-22, Murry, L. & S. Oil 1..... Dry

16-17-22, Wilkins, Amalgamated Oil 1 ..... Dry
Northwest of Paola, Lister, Okla. parties 1 ..... Gas
9-17-23, Hogan, Missouri Oil & Gas 1 ..... Gas
Near Block, Peckham, Phillips 1 ..... Gas

Gas 8
Dry 10
Gas production 3,000,000

ALLEN COUNTY.

30-26-18, Squire, Penn Oil 5 ..... Dry

NEOSHO COUNTY.

33-28-18, Abbott, Moore Bros. et al 2 ..... Dry

WILDCATS.

Greenwood County—
22-25-12, Loveland, Sinclair O. & G. 1 ..... Dry
Chase County—
22-22-9, Hughes, Matfield Oil 1 ..... Dry
McPherson County—
9-17-4W., Sangren, Lindsborg Oil & Gas 1 ..... Dry
Pawnee County—
29-3-12, Miller, J. F. Hurst et al 1 ..... Dry

Dry 4

OKLAHOMA.

OSAGE COUNTY.

20-27-9, American Pipe Line 1 ..... Gas
14-21-10, Osage & Okla. 233 ..... Gas
36-26-10, Barnsdall Oil 1 ..... Dry
25-25-10, Barnsdall Oil 10 ..... Gas
10-23-8, Henry Oil ..... Gas
25-23-8, Graham & Bird 6 ..... Dry
22-27-10, Echo Oil 4 ..... Dry
32-23-11, Osage, Tidal Oil 7 ..... Dry
22-24-10, Mass.-Okla. Oil 13 ..... Dry
32-23-11, Tidal Oil 7 ..... Dry

Gas 4
Dry 6
Gas production 17,000,000

WASHINGTON COUNTY.

6-26-13, Tehee, Phillips Petroleum 4 ..... Dry
19-28-13, Huston, Seamans Oil 1 ..... Dry
6-26-13, Tehee, Phillips Petroleum 6 ..... Dry
17-26-14, Climax Oil & Gas 3 ..... Gas

Dry 3
Gas 1

NOWATA AND NORTHERN ROGERS COUNTIES.

Cherokee Shallow Sand—
20-26-16, Kulchinski, Commercial National Bank of Nowata 6 ..... Dry
2-26-16, Rogers, Painter et al 1 ..... Dry
22-26-15, Prohoda, Aetna Oil 6 ..... Dry
2-26-16, Couch, F. C. Henderson 1 ..... Gas

Gas 1
Dry 3
Gas production 250,000

TULSA COUNTY.

Bird Creek and Flat Rock—
29-20-14, Frakes, Finton Oil & Gas ..... Dry
10-20-14, Young, Okla. City Oil & Gas 3 ..... Dry
29-20-14, Thompson, Ardizzone & Ossenbeck 3 ..... Dry
20-20-14, Rodman, Ike Simons et al 5 ..... Dry
10-20-14, Young, W. C. Brissey et al 3 ..... Dry
36-22-13, Kee, Tulsa Fuel 2 ..... Gas
Red Fork—
9-18-12, Fulton, Mt. Vernon Oil 8 ..... Dry
Bixby—
34-16-13, Moore, Magnolia Petroleum 4 ..... Gas
22-16-13, Bear, H. F. Wilcox 4 ..... Dry
22-17-13, Fox, Bissett et al 2 ..... Dry
29-17-13, Berryhill, Mid West Royalty 8 ..... Dry
34-16-13, Townsend, Cosden Oil & Gas 1 ..... Gas
Jenks and Broken Arrow—
2-19-14, Bruner, Seifrid & Co. 1 ..... Gas
6-19-14, Woods, Thompson et al 1 ..... Dry
35-18-14, Miller, Edgar Oil 6 ..... Dry
20-18-13, Phipps, Dundee Petroleum 12 ..... Dry
19-18-14, Cooper, Parkdale Oil & Gas 1 ..... Dry

Gas 4
Dry 13
Gas produition 16,500,000

CREEK COUNTY.

Cushing—
11-18-7, Smith, Iron Mountain Oil 3 ..... Dry
36-18-7, Jones, Carter Oil 1 ..... Gas
34-18-7, Hukey, P. O. & G. 3 ..... Gas
7-17-8, Samuel, Lancaster & Kerr 1 ..... Dry
20-18-7, Wacoche, P. O. & G. 6 ..... Dry
Mannford, etc.—
1-19-8, Anderson, Roxana Pet. ..... Gas
Glenn Pool—
22-17-11, Cloud, King Carlyle Oil 9 ..... Dry
33-17-11, Hill, W. M. Graham 1 ..... Dry
12-18-12, Bunger, Hamilton et al 1 ..... Dry
33-17-11, George, Cinco Oil 16 ..... Dry
34-18-11, Spocogee, H. U. Bartlett 1 ..... Gas
Kelleyville—
10-16-10, Pepper, Okla. Natural Gas 3 ..... Dry

Gas 4
Dry 8
Gas production 16,000,000

OKMULGEE COUNTY.

Mounds—
5-16-13, Tiger, Atlantic Petroleum 1 ..... Dry
31-15-13, Pigeon, Standard Royalties 1 ..... Dry
9-16-11, Fee, W. Graham 6 ..... Dry
9-16-11, Fee, W. Graham 5 ..... Dry
10-15-12, Robbins, C. B. Shaffer 1 ..... Dry
Hamilton Switch—
25-14-11, Teal, Texas Co. 1 ..... Dry
20-15-11, Drew, Morgan et al 10 ..... Dry
30-15-12, Robins, C. B. Shaffer 1 ..... Dry
Tiger Flats—
13-13-12, Grayson, Okmulgee P. & R. 6 ..... Dry
8-13-12, Leffard, Iowa Oil 1 ..... Gas
Bald Hill—
35-16-14, Anderson, Baker Oil 1 ..... Dry
18-14-13, Reynolds Drilling ..... Gas
33-15-13, Roberts, Tidal Oil 2 ..... Dry
19-14-15, Rentie, A. C. Saint et al 1 ..... Dry
2-14-13, Leader, Ohio Cities Gas 2 ..... Dry
6-14-15, Pattinger, Price et al 5 ..... Gas
7-14-15, Rentie, Mary Rentie Oil 5 ..... Dry
20-14-14, Hagerson, Henry, N. Y. O. et al 10 ..... Dry
20-14-14, Sadler, Henry, N. Y. Oil et al 10 ..... Dry
1-15-14, Charles, Caney River O. & G. 1 ..... Dry
28-15-13, Brown, W. T. Rapp 1 ..... Dry
26-14-13, Phillips, Neely et al 2 ..... Gas
Okmulgee-Morris—
1-13-13, Alexander, Nile Oil 6 ..... Dry
9-14-13, Colbert, French & Luttes 1 ..... Gas
13-13-12, Grayson, Okmulgee P. & R. 6 ..... Dry
18-14-13, Tiger, Deitrich et al 4 ..... Gas
1-13-13, Moore, Nile Oil 1 ..... Dry
26-14-13, Phillips, J. W. Neely 2 ..... Gas
1-13-13, Alexander, Okla. State Oil 6 ..... Dry
13-13-12, Grayson, Okmulgee P. & R. 6 ..... Dry

Henryetta—
9-12-14, Sampson, W. C. Newman 2 ..... Gas

Gas 8
Dry 23
Gas production 63,000,000

MUSKOGEE, WAGONER, ROGERS COUNTIES.

Inola—
30-19-15, Sunday, Laurel Oil & Gas 1 ..... Gas
Haskell—
5-16-15, Reynolds, Cosden Oil & Gas 3 ..... Gas
20-16-15, Asbury, Peterson et al 3 ..... Gas
17-15-16, Banks, Peterson et al 3 ..... Dry
17-15-16, Banks, Peterson, et al 4 ..... Dry
17-15-16, Harrison, Caney River Gas 1 ..... Gas
19-15-16, Howard, Caney River Gas 5 ..... Dry
20-15-16, Woodall, Pacific Petroleum 2 ..... Dry
35-15-15, Canada, Brown et al 5 ..... Dry
17-15-16, Banks, Brady et al 1 ..... Dry
20-16-15, Asbury, Melba Oil 1 ..... Dry
Boynton—
2-14-15, Harrison, Okla. Iowa Oil 2 ..... Dry
11-13-15, Seivers, Navajo Petroleum 2 ..... Dry
3-14-15, Smith, Cappes & Rose 1 ..... Dry
6-14-15, Conners, Hazlett & Price 6 ..... Gas
8-13-15, Rich, Penn-Wyoming Oil 1 ..... Dry
19-14-16, Beams, Probst & Morrison 2 ..... Gas
35-15-15, Canada, Brown et al 5 ..... Dry
5-14-16, Rentie, C. E. Harris 1 ..... Dry
19-14-15, Rentie, A. C. Saint et al 1 ..... Dry
10-14-16, Beams, Probst & Morrison 2 ..... Gas
Deer, W. C. Newman 1 ..... Dry
33-14-15,

Gas 7
Dry 15
Gas production 17,000,000

PAYNE COUNTY.

Outside Yale District—
26-18-5, Parker, Fortuna Oil 2 ..... Dry

PAWNEE COUNTY.

Cleveland—
32-21-8, Howe, State Lands Petroleum 1 ..... Dry
32-21-8, Phillips, State Lands Pet. 3 ..... Gas
5-21-8, Mullendore, Mullendore & Thompson 4 .... Dry
Maramec—
12-21-6, Danley, Ohio Cities Gas 1 ..... Dry

Gas 1
Dry 3
Gas production 5,000,000

KAY COUNTY.

Blackwell—
15-27-1W., Smythman, Cherokee O. & G. 1 ..... Gas
26-28- 1, Whiteside, Duluth & Okla. 1 ..... Dry
26-28-17, Whiteside, Duluth & Okla. 1 ..... Dry
31-29-1E., Sloan, Bermont Oil 1 ..... Dry
31-29-1, Hoover, Bermont Oil 2 ..... Dry
29-28-1, Warren, Carter Oil 8 ..... Gas

Gas 2
Dry 4
Gas production 8,000,000

CARTER COUNTY.

Healdton and Fox—
33-3-3, Sarasota, Strawn Oil 2 ..... Dry
14-4-3, Simpson, Gates Oil 1 ..... Dry
22-4-3, Watson, Texas Co. 22 ..... Dry
9-3-3, Bush, Osaple Oil 2 ..... Dry
6-3-2, Kirk & Patsy Oil 1 ..... Gas
6-3-2, Bogie, Marcum et al 1 ..... Gas
6-3-2, Bogie, Marcum et al 2 ..... Gas
23-4-3, Rose, Magnolia Petroleum 25 ..... Dry

Gas 3
Dry 5
Gas production 5,500,000

WILDCATS.

Pontotoc County—
22-5-8, Jackson, Stabb & McCann ..... Gas
28-5-8, Chicago Oil Co. ..... Gas
Love County—
13-7-3, Pierce Oil Corp. 1 ..... Dry
Coal County—
25-3N-9E., Lucillene Oil 1 ..... Dry
Carter County—
6-5S-1E., Coffey, Spectator Oil 1 ..... Dry
Stephens County—
30-2S-8W., Hart, W. J. Mack 1 ..... Dry
Kay County—
26-28-1E., Whiteside, Duluth-Okla. Oil 1 ..... Dry
Marshall County—
25-5S-5E., Arbuckle, Schumacher et al 1 ..... Dry
LeFlore County—
26-7N-26E., Durant, American Indian Oil 1 ..... Gas
Kay County—
25-28N-1W., Tyler, Kay & Kiowa Oil 1 ..... Dry
Cotton County—
23-1S-10W., Anderson, Keyes et al 1 ..... Gas
27-1-10, Boetsche, Keyes et al 1 ..... Gas
20-1N-10, Korthouse, J. P. Evans et al 1 ..... Gas

Gas 6
Dry 7
Gas production 64,000,000

ARKANSAS.

WICHITA AND WILBARGER COUNTIES.

Sevier County—
2-9-31, Powell, Clear Creek O. & G. 1 ..... Gas

Gas production 7,000,000

KANSAS.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry	Gas
Butler	95	22,475	20	5
Chautauqua and Elk	13	55	3	2
Montgomery	11	61	0	2
Wilson	22	153	1	3
Neosho	9	55	1	0
Allen	10	93	1	0
Miami-Franklin-Douglas	40	440	10	6
Wildcats	12	605	5	0
Total	212	23,937	41	18

OKLAHOMA.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry	Gas
Osage	49	3,025	7	2
Washington	25	217	2	1
Nowata-North Rogers	37	535	3	1
Tulsa	41	814	13	4
Creek	43	1,850	9	3
Okmulgee	94	5,120	23	8
Muskogee-Wagoner-Rogers	48	2,363	16	7
Payne	11	2,320	9	0
Pawnee	15	795	6	1

Garfield-Noble	4	1,165	1	0
Kay	24	7,630	4	1
Carter	34	1,613	5	2
Wildcats	20	145	10	6
Total	445	27,692	100	36

MID-CONTINENT.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry	Gas
Kansas	212	23,937	41	18
Oklahoma	445	27,692	100	36
Arkansas	1	0	0	1
Total	658	53,629	141	55

NORTH LOUISIANA.

Caddo—
32-13-11, J. M. Nabors, The Texas 6 ..... Dry
Bossier—
24-16-12, Caplis, The Texas 3 ..... Gas
Miscellaneous—
40-20- 4, Trezevant, Ouachita Nat. Gas & Oil 2 ..... Gas
21-22-13, McClanahan, Palmetto Pet. 1 ..... Dry
4-17-14, Cross Lake, J. G. Gambert et al 3 ..... Gas
31-20- 9, Hardin, J. Y. Steele 1 ..... Dry
29-20-14, Douglass, Red River Valley O. 1 ..... Dry
27-21-14, Dixon, Richardson Oil 1 ..... Dry

Dry 5
Gas wells 3

NORTH LOUISIANA.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry	Gas
Caddo	24	1,420	0	0
De Soto	2	75	1	0
Red River	0	0	0	0
Bossier	2	10	0	1
Miscellan's	7	15	4	2
Total	35	1,520	5	3

TEXAS PANHANDLE.

WICHITA AND WILBARGER COUNTIES.

Electra—
Tate, Trammel et al 2 ..... Dry
Davis, Pittsburg-Texas Oil 1 ..... Dry

Dry 2

CULBERTSON DISTRICT.

Jennings, Colorado-Texas Dev. 1 ..... Dry
Burnett (sec. 5), No. 3, Gulf Production ..... Dry
Burnett (sec. 7), No. 4, Gulf Production ..... Dry

Dry 3

BURKBURNETT.

Knauth, Staley et al 2 ..... Dry
Birk, Reynols Oil 11 ..... Dry
Harden, Mann et al 26 ..... Dry
Bentley, Burk Drilling Co. 1 ..... Dry
Knauth, Snyder-Burkburnett Oil 1 ..... Dry
L. F. Ramming, Panhandle Refining 10 ..... Dry
Meyers, Mann et al 1 ..... Dry
Waite, Shackelford 1 ..... Dry
Thom, Gulf Production 8 ..... Dry

Dry 9

WILDCATS.

Coleman County—
Wells, F. W. Turner et al 1 ..... Gas
Stephens County—
Binney, Texas & Pacific Coal 6 ..... Gas

TEXAS-LOUISIANA.

SUMMARY OF OPERATIONS.

	Comp.	Prod.	Dry	Gas
North Texas	71	1,666	15	2
North Louisiana	35	1,520	5	3
Gulf Coast	97	20,130	39	2
Total	203	21,316	59	7

STANDARD OIL SUBSIDIARIES.

BY JO. P. CAPPEAU SONS.

Par		Open	High	Low	Last
£1	Anglo-American	11⅞	12¾	11¾	11¾
$100	Atlantic Ref.	900	900	875	900
100	Borne-Scrymser	430	430	430	430
50	Buckeye Pipe	98	98	90	90
100	Chesebrough	320	320	310	310
100	Colonial	10	10	10	10
100	Continental	450	450	430	430
50	Crescent	30	30	30	30
100	Cumberland	135	140	130	130
100	Eureka	195	195	185	185
100	Galena, Com.	137	137	128	130
100	Galena, Pref.	120	120	115	115
100	Illinois Pipe	190	190	185	185
50	Indiana Pipe	93	94	93	93
12½	National Transit	12½	12½	12½	12½
100	New York Transit	190	205	190	200
100	Northern Pipe	100	105	100	104
25	Ohio Oil	340	340	327	327
100	Prairie Oil	480	480	465	475
100	Prairie Pipe Line	277	277	263	275
100	Solar Refining	290	290	290	290
100	Southern Pipe	180	183	180	180
100	South Penn. Oil	285	285	275	275
100	South West Penn. Pipe	90	95	90	93
100	S. O. of California	228	230	210	213
100	S. O. of Indiana	645	650	625	630
100	S. O. of Kansas	450	450	425	425
100	S. O. of Kentucky	310	310	310	310
100	S. O. of Nebraska	470	470	460	460
100	S. O. of New Jersey	548	548	525	525
100	S. O. of New York	275	275	255	260
100	S. O. of Ohio	410	410	390	390
100	Swan & Finch	95	95	90	90
100	Union Tank	87	90	83	90
100	Vacuum Oil	350	350	335	345
10	Washington Oil	25	25	25	25
25	Penn-Mex.	44	44	38	40
5	International Petroleum	13½	13½	12¾	13½
	Independent Oil Companies:				
5	Elk Basin	6⅝	6⅞	6½	6½
25	Pierce Oil	10	10	9½	9¾
50	Midwest Refining	110½	110½	102	103
25	Tropical Oil	5½	5	4	4
5	Cosden Refining	8	8	7⅛	7⅛
5	Sapulpa Refining	8⅜	8½	8	8
1	Northwest Oil	65	82	64	64
5	Cosden Oil & Bas. Pfd.	3¾	3¾	3½	3⅝
5	Okla. Prod. & Refining	7⅜	7⅜	6⅝	6¾
5	Atlantic Petroleum	3	3¾	2½	2½
10	Merritt Oil	21⅜	21¾	17½	17½
1	Midwest Oil	111	114	102	102

AROUND THE BELT

New Wells, New Pipe Lines, New Contracts, Additions and Extensions. A Fund of Valuable News Gathered for the Journal Through Many Sources.

TRADE PERSONALS

It will be noted that the names appearing under the personal heading are exclusively those of men interested in the development of the natural gas field. Those wishing to learn of matters pertaining to men interested in the field of artificial gas should refer to THE GAS INDUSTRY magazine published at 66 Pearl Street, Buffalo, N. Y., which devotes its columns entirely to artificial gas matters. That magazine is published by the editors of THE NATURAL GAS JOURNAL, each magazine being wholly owned by its respective field. In this way each magazine is 100% efficient to the industry it covers.—Publisher's Note.

[illegible], formerly connected with the Westinghouse Electric & Manufacturing Company as Refrigeration Engineer, has established himself as Consulting Engineer on his own account, specializing in refrigeration marine service, rubber mills and gasoline extraction plants. Office is located in the Monongahela Bank Build., Pittsburgh, Pa.

[illegible] H. M., president H. M. Byllesby & Company, who has devoted his time to government service since November, 1917, has been commissioned Lieutenant Colonel.

[illegible] Joseph L. [illegible] of Muskogee, Okla., has been elected Vice President of the [illegible] & Gas Company of Enid, Okla., a new [illegible].

[illegible] H. C., assistant to the Vice President of Middle & Company, Chicago, has been appointed to the Fuel Administration as a petroleum expert and will be stationed at Dallas, Texas.

[illegible] Arthur L. [illegible], vice president of the Barrett & Fuel Company, Barrett Building, has moved headquarters from Barrett Building to New York, because of the increasing necessity of his presence in Pine Street for consultation as to coal and natural gas matters, particularly the latter.

[illegible] W. H., acting purchasing agent H. M. Byllesby & Company, Chicago, has joined the 13th Engineers (Gas Regiment) Barracks and will be stationed at Camp Lee, Virginia.

[illegible] Fenn W. [illegible] of Henry L. Doherty & Company recently celebrated his forty-first birthday at Lawrence, New York, as the guest of his friends. Birthday gift consisted of a rare and handsome set of copies of "The Pilgrim's Progress" and extra pages recorded the signatures of all those present. Breakfast received in the neighborhood of seventy telegrams bearing congratulations from friends over the country.

[illegible] W. [illegible], who was formerly general foreman for the [illegible] Company, has resigned from that post in order [illegible] an office on his own account in Fort Worth, [illegible].

Milton [illegible] of Enid, Okla., is President of the newly organized Scouts Oil & Gas Company of Enid, Okla.

[illegible] H. W., superintendent of the El Reno, Okla., division of the Oklahoma Gas & Electric Company, has been appointed local chairman of the Military Training Camp Association.

Stewart [illegible], Jr., of Joplin, Mo., recently became Superintendent of Western Distribution for the Wichita Natural Gas Company, Wichita, Kan.

[illegible] L. V., formerly connected with the Sales Department of the Louisville Gas & Electric Company, Louisville, Ky., and the Fort Smith Light & Traction Company, Fort Smith, Ark., has joined the British military forces.

Warren H. [illegible] of Fresno, Cal., has been appointed assistant to M. L. [illegible], director of the oil division of the Fuel Administration. Mr. Welch is now in Washington.

DECEASED

[illegible] of Wichita Falls, Texas, manager of the coal and gas [illegible] of the Wichita Falls Gas Company, died at Wichita Falls, Texas, March [illegible].

Kansas [illegible], President of the Ohio Fuel Supply [illegible], died [illegible] at his home in Columbus, Ohio, [illegible] with pneumonia, and was interred [illegible] in Columbus.

ITEMS OF FINANCE

KANSAS—Independence

[illegible] Gas Company has voted an extra dividend of [illegible] in addition to the regular quarterly dividend of [illegible] per cent. Both are payable April 1st to stock of record March [illegible].

KENTUCKY—Lexington

[illegible] of the Central Kentucky Natural Gas Company and the [illegible] are reported as having been sold [illegible] some time [illegible] this matter being in charge of [illegible].

Louisville

The Louisville Gas & Electric has voted [illegible] per cent [illegible] on the [illegible] Stock, payable March [illegible].

1918, due September 1st, 1920. The proceeds from this new issue took care of the $1,500,000 6 per cent which became due April 1st, 1918.

LOUISIANA—Shreveport.

The capital stock of the Louisiana Gas Company has been increased from $400,000 to $1,000,000.

OHIO—Shelby.

The Shelby Oil & Gas Company has increased its capital stock from $8,000 to $64,000. Extensive development work in nearby fields is planned by the company. F. Marion Snyder is General Manager of the company.

PENNSYLVANIA—Pittsburgh.

According to a recent statement of the Pittsburgh Oil & Gas Company which covers a period of nine months ending December 31st, 1917, the company nad a surplus of $208,527 available for dividends, of which $100,000 went to stockholders. Gross income for the five months was $606,629 and net earnings were $339,680. Surplus for the period was $108,527.

Pittsburgh.

The Philadelphia Company has declared the regular semi-annual dividend of $1.50 on the 6 per cent cumulative preferred stock, payable May 1 to stock of record April 1.

INCORPORATED

DELAWARE—Dover.

The Tuxbury Oil & Gas Corporation has been incorporated under the laws of this state with a capital stock of $3,000,000. The Company will develop oil and gas leases in the state of Tennessee.

Dover.

A $2,000,000 corporation under the name of the Bell Oil & Gas Company has been formed here by Charles Douglis, Bernard Douglis, Samuel L. Lubell, and Samuel C. Bamport, all of New York.

ILLINOIS—Chicago.

The Republic Oil & Gas Company has been organized by a group of Chicago capitalists with a capital of $5,000,000.

OKLAHOMA—Enid.

The Scouts Oil & Gas Company has been formed here with a capital stock of $250,000. The operations of the company will extend to Texas, Kansas, and Oklahoma. The officers are: President, Bert L. Miller, Enid, Olka.; vice president, Joseph L. Cromwell, Muskogee, Okla.; second vice president, R. E. Young, Coffeyville, Kan.; secretary-treasurer, Frank H. Letson, Enid, Okla.; assistant secretary-treasurer, R. W. Ketelsen, Enid, Okla.

PER CUBIC FOOT—RATES

NEW YORK—Corning.

The Crystal City Gas Company is asking permission to increase its rate from 45 to 58 cents per thousand.

Elmira.

The Potter Gas Company, distributing natural gas in the Counties of McKean, Potter and Tioga, Pennsylvania, and Steuben and Chemung in New York, including the natural gas sold in Corning, filed with the Pennsylvania public service commission a new tariff, effective March 25, which makes changes in the application of the discount for prompt payment. Due to a restricted supply of gas, the company has discontinued its manufacturing rate and has divided its consumers into three classes.

Class A—Domestic consumers, to receive preference over all other consumers in case of a shortage.

Class B—Engines, greenhouses and small manufacturers using less than 500,000 cubic feet per month, to pay the same rate as class A, and have preference over class C in case of shortage of supply.

Class C—Glass manufacturers, wood alcohol plants and all other consumers using in excess of 500,000 cubic feet per month. Gas sold to consumers in this class is considered surplus gas and is sold subject to discontinuance whenever the supply is not adequate to meet the demands of the other classes. The rate for the service is the same as for the other classes.

OHIO—Cincinnati.

The Union Gas & Electric Company have in hand the framing of a petition asking permission to increase its rates.

Cleveland.

The East Ohio Gas Company in investigating the local situation with a view to providing for the demands of next winter, cites as one cause for the tremendous consumption of gas during the cold months the poor construction of houses, which are largely built for speculation. The Company holds that conservation of the gas supply could be brought about by increasing the rates to such an extent that other fuels would have to be resorted to for house heating.

PENNSYLVANIA—Pittsburgh.

Among the companies who on April 1st adopted higher gas rates are the Equitable Gas Company, the Alleghany Heating Company, and the Monongahela Natural Gas Company.

ONTARIO—Leamington.

The Beaver Oil & Gas Company which supplies Leamington from the Tilbury gas field, has requested an increase of 5 cents per 1,000 cubic feet, the present price to Leamington consumers being 30 cents per 1,000.

Back those Bayonets with Bonds.

GENERAL

ALABAMA—Birmingham.

The Dixie Gas Company, which has a franchise under which it will distribute natural gas in this city, has wells just outside the city which are producing 5,000,000 cubic feet of gas per day.

CALIFORNIA—San Francisco.

At the annual meeting of the stockholders of the Standard Oil Co. of California, the following were elected directors and officers: W. S. Rheem, president; K. R. Kingsbury, vice president; W. S. Miller, vice president; F. H. Hillman, vice president and director of producing; R. J. Hanna, treasurer and secretary and director of pipe lines; L. P. Smith, director.

DISTRICT OF COLUMBIA—Washington.

Under a bill introduced in the House of Representatives by Representative Norton of North Dakota, President Wilson is authorized and directed to fix prices on gasoline and fuel oil. According to the bill, hoarding of oil, which at present is tending to disorganize supply systems of the army and navy, would be preveted by price fixing.

KANSAS—Augusta.

The Mid-Kansas Oil & Gas Company has a fair gasser in its No. 6 on the Ruthford property at a depth of 1780 feet. The well will be drilled deeper for oil.

Parsons.

The local gas company has notified its consumers that it will not be able to furnish enough gas next winter to satisfy all demands, and advises early stocking of other fuels.

KENTUCKY—Grayson County.

In the Leitchfield pool, the Kentucky Oil & Refining Company's second well on the Henton farm is estimated good for about 750,000 cubic feet of gas.

Louisville.

Donald McDonald, general manager of the Louisville Gas & Electric Company, Louisville, Ky., has offered two of the Company's vacant plots of ground to citizens for war gardens.

The Commercial Department of the Louisville Gas & Electric Company reported a gain of 93 customers in the gas department for the week ended March 31st.

Powell County.

The Petroleum Producing Company's No. 1 Isaac Sparks farm, is reported showing for better than a 1,000,000 cubic foot gas well.

Wolfe County.

The Green River Oil Company got a small showing of oil, and 500,000 cubic feet of gas, in No. 1, E. B. Tyra.

LOUISIANA—Lincoln Parish.

Two wells are being drilled by the Oklahoma-Wyoming Oil & Refining Company for Louis Lock, one in this Parish, and one in Bienville Parish.

Monroe.

The Southern Carbon Company is establishing a casing-head gasoline plant in this field.

The Southern Carbon Company encountered a streak of bad luck when a blaze destroyed the derrick at their No. 3 well on the Spryker land. Gas had been struck at a depth of 2200 feet, and in some way took fire. The crew was successful in putting out the blaze, but not until after the derrick was a total loss.

Monroe.

A second gas main, duplicating the first one laid, is being constructed by the Ouachita Natural Gas & Oil Company connecting the city with the gas field, thus to insure a satisfactory supply of gas for its customers at all times.

New Orleans.

A well which was drilled to a depth of 1300 feet by the Young Men's Gymnastic Club to secure a supply of water, is yielding gas, the supply being great enough to be a source of profit.

New Orleans.

Two applications for franchises are before the commissoners, one of them being filed by the McCormick interests of Shreveport, La., and the other by local people. It is proposed to pipe the gas from the Terrebonne field, near Houma, Terrebonne Parish, 45 miles southwest of New Orleans.

E. W. Shaw, of the United States Geological Survey, has made a report to the mayor to the effect that there is sufficient gas in the Terrebnoe field to supply the city. Mayor Behrman favors a municipally-owned distributing plant and that the gas should be brought to the river for seven cents a thousand cubic feet, the city retailing it for 25 cents and 30 cents a thousand feet. The franchise applications name a price of 50 cents a thousand to domestic consumers and offer to furnish free gas to the city.

Pine Island.

A 40,000,000-foot gasser has been drilled in in section 25-21-15, by the Farmers Oil Company. Much leasing is recorded, and it is expected that this territory will be fully developed.

Shreveport

In the Pine Island District the Texas Co.'s No. 3 Heilperin, Section 28-21-15, is blowing 3,000,000 feet of dry gas at 2,200 feet and will be drilled deeper.

OHIO—Ashtabula County.

In the extreme northeastern corner of Ohio, in Saybrook Township, the Commercial Oil & Gas Company has completed a test on the Bebout farm, showing a capacity of 6,000,000 cubic feet a day.

Cincinnati.

The local gas company recently suffered a loss of property amounting to $25,000 caused by the blowing up of a 24-inch gas main.

Findlay.

The city is drilling several wells near the water works station, the gas to be used as fuel in order to conserve coal. One well previously drilled is maintaining very good production.

Mifflin County.

The Logan County Natural Gas Company has taken fourteen leases on farms in this county. Extensive development work is planned for the near future.

Washington County.

One mile west of production, in Grandview Township, the Hill Top Oil Co. has drilled a second test on the Witten Hanlon farm, into the Keener sand. The well shows a gas pressure of 150,000 cubic feet a day, and is spraying oil at the rate of 5 bbls. a day.

NEW YORK—Buffalo.

The Forest Gas Company of Buffalo, has been authorized by the up-state public service commission to acquire the outstanding issues of stock of the Alden-Batavia Natural Gas Company, the Akron Natural Gas Company, the Attica Natural Gas Company, the Ontario Gas Company, and the North Buffalo Gas Fuel Company, together with 4,342 shares of the capital stock of the Niagara Light, Heat & Power Co. The companies are all located in the vicinity of Buffalo.

Dunkirk.

The South Shore Natural Gas Company has moved into its new quarters at 433 Central Avenue. The offices are attractively fitted up, and modern and convenient in every respect.

Smith Mills.

The South Shore Gas Company is drilling a well on the Franklin farm near Smith Mills, the drill being down 1,400 feet. It will be drilled to a depth of 2,400 feet.

ONTARIO—Toronto.

Representations are being made to the Ontario government by many interests, asking amendments to the Natural Gas Act, passed at the present session of the legislature and by which complete control of the natural gas industry in Ontario was given to the Ontario Municipal and Railway board. The tile makers in Tilbury East, whose plants operate with natural gas and supply 50 per cent. of the tile manufactured in Ontario, claim that they are entitled to preferential treatment in view of the importance of tile drainage to food producion. Farmers' organizations are strongly supporting these representations; and are also objecting to clauses in the act empowering the railway board to fix the price of natural gas regardless of existing franchise agreements, and to order the shutting down of producing wells where deemed necessary. It is claimed that the latter clause particularly will tend to discourage drilling, particularly on the part of Americans.

OKLAHOMA—Bartlesville.

The country club just outside of this city of whose 350 members 250 are connected with Empire Gas and Oil Companies, is a monument to the Doherty Organization. The club grounds cover 80 acres of Osage Indian land. Provisions have been made for golfing, bathing, tennis, roque, and trapshooting. The club house is of generous proportions and furnished with every comfort.

The club's affairs are now in the hands of the following executive committee: Alfred J. Diescher, W. A. Williams, H. R. Straight and R. C. Russum, Empire officials; H. V. Foster, Frank Phillips and W. H. Merritt. J. P. Chalmers, assistant secretary of the Empire and secretary of the Oak Hill executive committee, is one of the chief guiding spirits. W. F. Broadnax, superintendent of Empire buildings, manages the club for the committee.

The Empire Gas & Fuel Company has cerried on a vigorous campaign in the interests of the War Savings and Thrift Stamps, having sold them to the extent of $2,598 up to March 15.

Bixby.

The Prairie Oil & Gas Company has a 3,000,000-foot gasser in its No. 1 on the Crosby property in the southeast corner of section 8-17-13.

Cotton County.

Keyes and others No. 1 test on the J. Q. Grass land in section 26-1s-10w is shut down at 2000 feet, and is making 10,000,000 cubic feet.

Creek County.

In the Cushing field, the Monitor Oil & Gas Company's No. 3 on the Fixico farm, in the northeast of the northeast quarter of section 1-17-7, is doing 6,000,000 feet of gas from sand at 2,894-2,944 feet.

The Prairie Oil & Gas Company completed a 6,000,000-foot gas well in No. 37 on the Watson farm, in the northeast of the noreast of the northwest quarter in section 21-17-7. It was drilled to 2,243 feet.

Drumright.

The White & Black Oil Company of this city has sold the output of its big gasser in section 1-17-7 to the Oklahoma Natural Gas Company. A six-inch line is being constructed to connect the well with the Oklahoma Company's distributing system.

Fox Field.

The Gypsey Oil Company has a 20,000,000-foot gasser in its No. 2 on the Moncrief land in section 32-2s-3w, at a depth of 2316 feet.

The Lindersmith No. 2 test in section 33-2s-3w is reported good for 10,000,000-cubic feet at a depth of 2157 feet.

The Carter Oil Company, in the west half of the northeast quarter of Section 29-2s-3w, has 30,000,000 feet of gas at 2,2 5 feet, with rock pressure of 600 pounds.

Haskell.

In this field the Melba Oil Company saved 500,000 feet of gas in its test on the Asbury farm in section 21-16-15.

The Presto Oil & Gas Company's No. 2 on the Kelly farm in section 29-16-15 is reported as making 4,000,000 cubic feet.

Kay County.

In the Blackwell district, the Empire Gas & Fuel Company completed two big gassers. No. 2 on the Presbury farm, in the center of the southwest of the southwest quarter of Section 29-29-1 east, is good for 20,000,000 feet at 2,607 feet, and No. 4 on the Pratt farm, in the southeast of the southwest quarter of section 31-29-1 east, is a 10,000,000-foot gasser at 2,215 feet.

Nowata.

The T. B. Gasoline Company, it is reported, is installing a plant for the making of lampblack.

Oklahoma City.

The School Land Commission has decided to advertise for leasing oil and gas lands belonging to the State of Oklahoma in Cotton and Stephens Counties.

Okmulgee County.

In the Youngstown Pool, Hamilton Switch district, the Okmulgee Producing & Refining Company has completed a 12,000,000-foot gasser.

The Company also got 5,000,000-foot of gas in its No. 2 Phillips & French, on the Foster farm, section 36. The well was drilled 14 feet into the sand found at 2130 feet, but showed no oil.

A 7,000,000-foot gasser has been completed by A. L. Morgan in his No. 1 test on the Bruner land, in the southwest of the southeast quarter of section 9-16-12.

The Ohio Cities Gas Company completed a 4,000,000-foot gas well at 2,031 feet in its No. 2 on the Berryhill farm, in the northeast of the southeast quarter of section 17-14-13.

Tulsa County.

The Albino Oil Company has a 1,000,000-foot gasser at a depth of 1336 feet in its No. 1 on the Heindelman land.

A pumping station will be installed on the Copan lease of the Grafeman Oil & Gas Company. Permission to make this installation was granted by the Superior Court.

Wagoner County.

In Coweta District, the Gladys Bell Oil Company's No. 2 on the Monroe farm, in the southwest quarter of section 29-17-15, is making 500 bbls. of oil with about 5,000,000 feet of gas. It is 29 feet in the sand.

A 3,000,000-foot gasser is reported by F. D. Misener in his No. 4 on the McHenry property in the northeast of the northwest quarter of section 29-18-15.

Washington County.

The Keystone Oil Company has a 1,000,000-foot gasser in its No. 1 on the Frank Wilson farm in section 17-26-13.

Yale.

C. B. Shaffer's No. 2 on the McCorkell farm, in the northwest of the southeast quarter of section 26-18-5, is a 2,000,000-foot gas well at 2,947 feet.

Yukon.

The city authorities are undertaking to test the surrounding territory of this city for oil and gas. In one test well on the Steele farm, gas was found at a depth of 2,000 feet.

PENNSYLVANIA—Allegheny County.

In the old Cookson field, near the Allegheny-Beaver County line, Harbison & Company have drilled a test on the Ihman heirs' farm through the Boulder. It is a fair gasser in that formation.

Greene County.

On Hoge Run, Cedar Township, the Phiadelphia Company has completed a second test on the William Hoge farm. It is a gasser in the Gordon sand.

Pittsburgh.

The annual report of the Union Natural Gas Company for 1917 shows earnings of 33 per cent after deduction of war income and excess profit taxes.

TEXAS—Brownwood.

2,000,000 cubic feet of gas was developed in the Magee well located fifteen miles southwest of this city. The gas sand was found at a depth of about 456 feet. At a depth of 1200 feet the well has a capacity of 8,000,000 cubic feet, and a rock pressure of 500 lbs.

Petrolia.

This field leads in the production of gas in northern Texas, the output being 197,000,000 cubic feet per day. The total production of this part of the state is estimated at 235,000,000 cubic feet per day.

Red River.

The Texola Oil Company completed a well in No. 1 La-Delta Pecan Company, section 27-13-11, making 2,500,000 feet at 840 feet.

The Gulf Refining Company is drilling at 2,450 feet in No. 10 Christopher, section 16-13-10.

Stephens County.

The Prairie Oil & Gas Company's Rayney No. 1, near the village of Lacasa, about 13 miles north of Ranger, is making about 25,000,000 feet of gas from a sand at 1,985 to 1,995 feet.

UTAH—Boxelder County.

The Corinne Oil & Gas Company has brought in a good gasser at Corinne Station, located six miles west of Brigham City. W. F. House, Corinne, is President of the company.

WEST VIRGINIA—Barbour County.

On Isaacs Fork of Elk Creek, Elk district, the Hope Natural Gas Company's test on the M. D. Riley farm is a gasser good for 500,000 cubic feet a day.

Cabin Creek.

The Ohio Cities Gas Company is erecting a gasoline plant in this field which occupies an area of about eight square miles. The plant will be equipped for

both the compression method and the absorption method of gasoline recovery.

Lewis County.

In Court House District, the Reserve Gas Company has completed a Fifth sand gasser on the T. H. Cummings farm.

On Alum Run, the Hope Natural Gas Company's test on the Owen Quinn farm is a gasser in the fifth sand.

In Freeman's Creek district, the Reserve Gas Company drilled a test on the A. P. White farm developing a fair gas pressure, and the Hope Natural Gas Company's test on the Owen Quinn farm is a gasser.

Marshall County.

In Liberty district, the Carnegie Natural Gas Company has completed a fair gasser at a second test on the Jacob Miller farm.

In Liberty district, the Manufacturers' Light and Heat Company has been completing some fair gas wells. In tests on the M. Rhine and Robert Buzzard farms are also fair gassers. The same company is due at a test on the G. M. Miller farm. The Carnegie Natural Gas Company has a gasser on the H. G. Fair farm, and James Wilson & Company, are due at a test oh the W. S. Phillips farm.

Spencer District.

A well of large producing capacity has been completed in this district by the United Fuel Gas Company, a concern owned jointly by the Columbia Gas & Electric Company and the Ohio Fuel Supply Company.

WYOMING—Big Muddy.

The Kinney & Ohio Oil Company has completed its cashinghead gasoline plant, and is recovering about 1500 gallons of gasoline per day.

Byron.

Larrabee Brothers are installing a gasoline absorption plant in this field, and in connection with it a plant for the making of lampblack. The plant is being equipped by the Hope Engineering & Supply Company of Mount Vernon, Ohio.

ALBERTA—Edmonton.

In the Viking field east of Edmonton, the Alberta Volcanic Oil Company has finished No. 1 well. This was drilled for oil, but developed a good gasser.

ONTARIC—Chatham.

In Dover township, the Union Natural Gas Company is drilling its No. 7 and No. 8 wells.

Haldimand County.

The Diener Gas & Manufacturing Company, Ltd., is drilling on its leaseholds in Canboro Township. One well has been completed, and is showing a fair production. No. 2 well is under way. The company will sell its product to the Provincial Gas & Fuel Company, Ltd.

London.

The City Gas Company, of London, Ontario, which distributes artificial gas in that city, has applied to the city authorities for permission to distribute natural gas mixed with the artificial product. The company states that this step is necessitated by the high prices of coal and fuel oil, and the difficulty of securing the latter, owing to demands for naval and munition purposes. The use of natural gas would enable the company to do without fuel oil and to dispose of its coke product to good advantage. As an alternative, permission is asked to increase the present rate for artificila gas which is 90 cents per 1,000.

Port Talbot.

A well has been completed here which is estimated to be producing between 6,000,000 and 7,000,000 cubic feet per day. The Southern Ontario Gas Company owns this well, and will pipe the gas to London, Ont.

Sherbrooke Township

Two wells with a capacity of about 1,000,000 cubic feet each, were brought in recently by the Sterling Gas Company, Ltd.

Shetland

The Shetland Gas Company has completed the mains which will supply the city with gas from the Smith well which is located at Smith's Falls, two miles east of Shetland.

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Kadel & Herbert

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CONTENTS OF THIS ISSUE

FROM THE EDITORIAL MAIL BAG:

INDEX OF PAST 1918 ISSUES

MEMBERS OF ASSOCIATION OF NATURAL GAS SUPPLY MEN

DAVID O. HOLBROOK, President, Oliver Building, Pittsburgh.

LARMOUR ADAMS, Secretary, 1304 First National Bank Building, Pittsburgh.

Ajax Iron Works, Corry, Pa.
Allegheny Steel Co., Pittsburgh.
Anchor Packing Co., Pittsburgh.

Bessemer Gas Engine Co., Grove City.
Blodgett Co., Inc., The G. S. Burlington, Vt.
Borden Company, Warren, Ohio.
Bovaird & Seyfang Mfg. Co., Bradford, Pa.
Bristol Co., The, Waterbury, Conn.
Broderick & Bascom Rope Co., St. Louis.
Bryant Heater & Mfg. Co., Cleveland.
Buffalo Co-operative Stove Co., Buffalo.
Builders Iron Fdy., Providence.
Byers, A. M. Co., Pittsburgh.

Carnegie Steel Co., Pittsburgh.
Chaplin-Fulton Mfg. Co., Pittsburgh.
Cincinnati Rubber Mfg. Co., Cincinnati.
Clark & Norton Mfg. Co., Wellsville, N. Y.
Cleveland Gas Meter Co., Cleveland.
Colona Mfg. Co., Pittsburgh.
Columbia Gas Stove Co., Huntington, W.Va.
Columbian Rope Co., Auburn, N. Y.
Columbus H't'g & Vent'g Co., Columbus.
Continental Supply Co., St. Louis.
Cooper, C. & G Co., Mt. Vernon, O.
Crandall-Pettee Co., New York City.
Cutler Hammer Mfg. Co., The Milwaukee.

Davis-Bournonville Co., Jersey City.
Dayton Pipe Coupling Co., Dayton.
Davison, N. C., Gas Burner & Weld'g Co., Pittsburgh.
Domestic Engineering Co., Dayton, O.
Draeger Oxygen Apparatus Co., Pittsburgh.
Dresser, S. R., Mfg. Co., Bradford, Pa.

Equitable Meter Co., Pittsburgh.
Estate Stove Co., Hamilton, O.

Fitler, Edwin H. Co., Philadelphia, Pa.
Foxboro Co. The, Foxboro, Mass.
Franklin Co. The, Canton, O.
Frick & Lindsay Co., Pittsburgh.
Fuel Oil Journal, Houston, Texas.

Garlock Packing Co., Palmyra, N. Y.
Gas Age, The, New York City.
Gas Appliance Co., Cleveland.
Gas Record, Chicago.
General Fire Ext'g'r Co., Providence.
General Gas Light Co., Kalamazoo.
Germer Stove Co., Erie.
Gilfillan Machine Works, Ebenezer, N. Y.
Goodrich, B. F. Co., Akron, O.
Graves Supply Co., Cincinnati.
Guardian Gas Appliance Co., The, Cleveland, Ohio.
Gwynn Gas Burner & Eng. Co., Pittsburgh.

Hammon Coupler Co., Pittsburgh.
Haymond Co., Muncie, Ind.
Hays Mfg. Co., Erie.
Hart Mfg. Co., Cleveland.
Hazard Mfg. Co., Chicago.
Heeter, C. M. Sons & Co., Inc., Butler, Pa.
Hewitt Rubber Co., Pittsburgh.
Hooven, Owens, Rentschler Co. Hamilton O.
Hope Engineering & Supply Co. Pittsburgh.

Ideal Heating Co., The, Columbus.
Imperial Belting Co., Chicago, Ill.
Ingersoll-Rand Co., Pittsburgh.
International Hale Gas Mixer Company, Providence.
Iroquois Natural Gas Co., Buffalo, N. Y.

Jarecki Mfg. Co., Erie.
Jiffy Water Heater Co., St. Louis.
Jones & Laughlin Steel Co., Pittsburg, Pa.

LaBelle Iron Works, Steubenville, O.
Lattimer-Stevens Co., Columbus, Ohio.
Leschen, A. & Sons Rope Co., St. Louis.
Lezius Automatic Draft Reg. Co., Cleveland.
Lucey Mfg. Corp., Pittsburgh.
Ludlow Valve Mfg. Co., Pittsburgh.

Macomber & Whyte Rope Co., Chicago.
Manhattan Rubber Mfg. Co., Passaic, N. J.
Mark Mfg. Co., Chicago.
Maxon Premix Burner Co., Muncie, Ind.
Meek Oven Mfg. Co., Newburyport, Mass.
Metric Metal Works, Erie.
Minneapolis Heat Reg. Co., Minneapolis.
Modern Iron Wks., Quincy, Ill.
Modern Safety Iron Co., Philadelphia.
Moon Mfg. Co., The, Chicago.
Moore, Lee C. & Co., Inc., Pittsburgh.
Moser Mfg. Co., Kane, Pa.
Mueller H. Mfg. Co., Decatur, Ill.

Nathan Mfg. Co., New York City.
National Supply Co., Pittsburgh.
National Transit Pump & Mach. Co., Oil City, Pa.
National Tube Co., Pittsburgh.
Natural Gas & Gasoline Journal, Buffalo.
New Bedford Cordage Co., New York City.
New York Belt'g & Pack'g Co., New York.
Nye, A. T. & Son Co., Marietta, O.

Oil & Gas Journal, Tulsa, Okla.
Oil City Boiler Wks., Oil City, Pa.
Oil Trade Journal, New York.
Oil Well Supply Co., Pittsburgh.
Oxweld Acetylene Co., Chicago.

Parkersburg Mach. Co., Parkersburg, W.Va.
Parkersburg Rig & Reel Co., Parkersburg, W. Va.
Peerless Heater Co., Pittsburgh.
Pennsylvania Furnace & Stove Co., Warren, Pa.
Pittsburg Meter Co., East Pittsburg.
Pittsburg Reinforced Brazing & Mach. Co., Pittsburgh.
Pittsburg Valve & Fittings Co., Pittsburgh.
Pittsburg Valve, F'd'y & Const. Co., Pittsburgh.
Pittsburgh Water Htr. Co., Pittsburgh.
Plymouth Cordage Co., N. Plymouth, Mass.
Pratt & Cady Co., Inc., New York City.
Prichard Supply Co., Mannington, W. Va.

Rathbun-Jones Eng. Co., Toledo.
Reid, Jos. Gas Engine Co., Oil City, Pa.
Reliable Stove Co., Cleveland.
Republic Iron & Steel Co., Youngstown, O.
Revere Rubber Co., Chelsea, Mass.
Reznor Mfg. Co., Ltd., Mercer, Pa.
Riesenman Mfg. Co., Ltd., Franklin, Pa.
Robinson, J. E. & Co., Oil City, Pa.
Robinson Packer & Mach. Co., Coffeyville, Kansas.
Roebling, John A. Sons Co., Trenton, N. J.
Rossendale-Reddaway Belt'g & Hose Co., Newark, N. J.
Ruud Mfg. Co., Pittsburgh.

Sanitary Co. of America, Linfield, Pa.
Schaeffer & Budenberg Mfg. Co., Pittsburgh.
Scientific Heater Co., The, Cleveland, Ohio.
Selas Co., Canton, O.
Solar Light Co., New York City.
South Chester Tube, Chester, Pa.
Spang, Chalfant & Co., Pittsburgh.
Sprague Meter Co., Bridgeport, Conn.
Strause Gas Iron Co., Philadelphia.
Superior Gas Engine Co., Springfield, O.

Tate-Jones & Co., Inc., Pittsburgh.
Taylor, W. P. Co., Buffalo.
Toledo Pipe Thr'd'g Mach. Co., Toledo, O.
Troop Mfg. Co., Pittsburgh.

United Seal Co., Columbus.
Utica Valve & Fixture Co., Utica, N. Y.

Welsbach Co., Gloucester City, N. J.
Westinghouse Mach. Co., Pittsburgh.
Westinghouse Electric & Mfg. Co., Pittsburgh.
Wheeling Steel & Iron Co., Wheeling.
Wolfe, Linden W., Oil City, Pa.
Worthington Pump & Mach. Corp., Buffalo.
Wright Wire Co., Worcester, Mass.

Youngstown Sheet & Tube Co., Youngstown, O.

ANNUAL CONVENTION NATURAL GAS ASSOCIATION OF AMERICA—May 22-23, at William Penn Hotel, Pittsburgh, Pa.

READ THIS

You're a regular, red-blooded, true-blooded American. You love your country. You love that flapping, snapping old flag. Your heart thumps hard when the troops tramp by. You're loyal, you're 100%.

You want to help win the war in a hurry.

"A sacrifice?" Sure, you've been thinking. "Just you wait until they really need it." And you have honestly thought you meant that too. But - look yourself in the eye now and search up and down inside of your heart--- Did you mean it? Did you really mean "sacrifice?"

Listen: You feel poor. The Third Liberty Loan, the high prices, the income tax, you've done your bit. You feel that you have given all you can spare.

Well, then, what did you mean? What's that you said about loving your country? What do you think the word "sacrifice" means?

Surely, you did not mean, did you, to give only what you can <u>spare</u>?

What about our boys who are giving their lives in the trenches? Are they giving only what they can "spare?"

How about those mothers and little "kiddies" in the shell-wrecked towns of that shell-swept hell: hungry, ragged, sobbing alone? Giving up their homes, their husbands, their fathers.

While we over here with our fun and our comforts, we hold up our heads and feel patriotic because we have given---what? Some loose bills off the top of our roll. "We've given all we can spare"! Come, come! Let's quit fooling ourselves. Let us learn what "sacrifice" means. Let us give more than we can spare -- let us "give until the heart says stop."

-Contributed.

FROM THE EDITORIAL MAIL BAG

NATURAL GAS ASSOCIATION

There will this year be no exhibition

LABOR SAVING MACHINES AS OIL FIELD FIXTURES

WEST VIRGINIA CONVENTION

MEN FOR EXPORT TRADE

Let them feel you are with them through your Red Cross gifts

NATURAL GAS WRINKLES.

IT is with sincere gratification that we acknowledge a letter received from the editor of the "Wrinkle Department" of the Natural Gas Association, Mr. W. Re. Brown, of which Department of the Natural Gas Association's work, Mr. A. J. Diescher is Assistant Editor.

The following letter refers especially to the double pages in colors, published in the month of April in THE NATURAL GAS AND GASOLINE JOURNAL, "boosting" for the Wrinkles Committee, while at the same time lending thereby a good and substantial hand to the Natural Gas Association through assisting to make the coming convention at Pittsburgh, May 22nd and 23rd a big and howling success. Mr. Brown's letter reads as follows:

NATURAL GAS ASSOCIATION
OF AMERICA

Columbus, Ohio, April 29, 1918.

Mr. L. S. Bigelow,
Natural Gas and Gosoline Journal,
Buffalo, N. Y.

Dear Mr. Bigelow:

You have surely "gone over the top" in an endeavor to make THE NATURAL GAS AND GASOLINE JOURNAL a real boost organ for the Natural Gas Association's activities.

Your "spread eagle" boost for the Wrinkle Department was surely appreciated by Mr. A. J. Diescher and myself, and I am equally sure that the officers and members of the Association, will be pleased to see how you are backing up their efforts to make the war-time convention a success.

Yours very truly.
W. R. BROWN.

THE NAME CASINGHEAD.

A LETTER from A. H. Fisher, Pittsburgh, states that Mr. Fisher is advocating relegating to the background the name "Casinghead" as applied to a particular kind of gas. He states that the term "Casinghead" is a perfectly proper term in its proper place, but its application to the gasoline field is, as he calls it, a misnomer.

Mr. Fisher's feeling in this matter is similar to what was our own, when we urged that the word "extraction," and the word "extracting," in the field of recovering gasoline, should be entirely done away with, and in place thereof, the words "recovery" and "recovering" should be used.

Our argument in urging this last suggestion, is that the non "gas-educated" public might easily misunderstand the term "extracted" to mean taking from the gas that which would be of decided value, if it remained in the gas; whereas, the term "recovery," and the word "recovering," are directely in line with the trend of the times, namely, getting the most out of everything and letting nothing go to waste.

BEWARE! BEWARE!

THERE are various "high-flyer" and questionable propositions going the rounds, and we advise thinking people to consider twice before deciding to invest.

Sometimes a good proposition is widely promoted and those make money who become interested in it, but more often losses would be heard of if shame did not prevent.

The word "Sensational," when used in connection with the sale of oil stocks, should be a warning sign in many instances, and when the word is coupled up with the words "vast opportunity," then look out. These words appeared recently in connection with others in a sensational head-line advertising certain oil stocks that when sold promise to make the buyers rich beyond measure.

When the words "Gigantic Fortune" are used, again we say, consider well, then when it is stated that "Unlimited are the possibilities," it is well to be sure that these possibilities are not those of losing all that one invests, rather than as the promoters would wish to indicate, that there is untold wealth to be realized.

Sometimes the printer is at fault in making up copy for promoters, but the earmarks of unreliability are attached to a sheet that makes promises in glaring head-lines to the possible investor, and uses strong adjectives in telling of the wonderful things that await him if he will but buy the stock.

The words we have printed in this notice are familiar words in the work of a promoter. We do not point to them as applying in this instance to any one particular enterprise, but feel it our duty in view of recent advertisements that have appeared, to advise very careful consideration before one invests.

OUTPUT OF REFINERIES.

The Department of the Interior sends us the following information, which will be of interest to those who seek to keep track of refineries output.

1917	First Nine Months	October	November
Crude Run (bbl.)	224,295,919	26,971,980	25,516,693
Oils purchased and Re-run (bbl.)	7,445,101	2,863,518	2,519,700
Gasoline (gal.)	1,962,205,420	265,634,890	258,696,514
Kerosene (gal.)	1,226,118,966	135,775,025	121,133,610
Gas & Fuel (gal.)	4,548,676,207	608,327,006	580,140,259
Lubricating (gal.)	533,700,128	66,289,783	642,631,249
Wax (pound)	316,796,738	46,623,624	39,502,101
Coke (ton)	353,425	42,746	42,508
Asphalt (ton)	522,475	61,579	58,840
Miscellaneous (gal.)	400,348,067	90,341,931	85,863,880
Loss (bbl.)	8,644,040	1,299,477	1,147,662

1917	December	Total 1917	Daily Average
Crude Run (bbl.)	24,534,726	301,319,318	828,532
Oils purchased and Re-run (bbl.)	2,069,351	14,897,670	*40,816
Gasoline (gal.)	243,175,209	2,729,712,033	7,478,663
Kerosene (gal.)	118,987,502	1,602,015,103	4,389,082
Gas and Fuel (gal.)	551,287,109	6,288,430,581	17,228,577
Lubricating (gal.)	59,023,661	721,644,821	1,977,109
Wax (pound)	38,185,497	441,107,964	1,208,515
Coke (ton)	42,301	484,180	1,327
Asphalt (ton)	47,376	690,279	1,891
Miscellaneous (gal.)	86,595,992	663,149,870	1,816,849
Loss (bbl.)	1,182,671	12,273,850	33,627

*No account of this item for first six months.

Money means mercy for the wounded. Give freely.

Harry C. Reeser

Born, September 1864 — Died, March 1918.

WE have learned with sincere sorrow of the death of our gas-field acquaintance, and personal friend, Mr. Harry C. Reeser, whose portrait will bring to the minds of many who have met Mr. Reeser at conventions of the natural gas field, one of the leading figures of the field.

No one could better write of Mr. Reeser, than his friend and our friend, Mr. W. Re Brown, editor of **"The Gas Magazine,"** published by the Ohio Fuel Supply Company for its patrons.

HARRY C. REESER.

An editorial by Mr. Brown, published in the memorial number of his magazine, bearing date of March-April 1918, and addressed to the patrons of the Ohio Fuel Supply Company, read as follows:

"You, the patrons, and all officers and employes of The Ohio Fuel Supply Company have lost a sincere friend.

"It has been truly said that as the heart thinketh so is the man. This thought strikes to the fundamental truth of things. It wipes away the camouflage of manners and of form, of polish and expediency and brings a man back to what he really is. With this truth in mind it is a striking fact to know that all who speak of Mr. Reeser, dwell on the sincere simplicity of the man, his lack of cant and sham. People liked him because they knew they were dealing with the heart of him.

"This trait might not be considered so unusual in a man whose life was one of ease and good fellowship, but it was remarkable in a man of Mr. Reeser's capacity for business and his apparently limitless activity. From early morning to late he was a dynamical center of energy, always busy with big things, but with such wonderful grasp of details that each man associated in business with him felt that Mr. Reeser knew as much about his particular activities as he did himself.

"There seemed to be no limit to his energy or good will. He was never too busy to show in manner and speech that the work he was doing was one of service to humanity. If ever a man showed his heart's wishes in his daily work, that man was Harry C. Reeser. His life was devoted to service, and he never forgot that this service was one to the public as well as to the business he so capably directed.

"Each patron of The Ohio Fuel Supply Company has sustained a personal loss. This loss may not be so well known or so keenly felt by the thousands of gas users as it is by every officer and employee of The Ohio Fuel Supply Company, but even those who did not know him personally cannot but mourn, for it is a loss to the World when such a man as Harry C. Reeser must answer the great summons.

"This number of the Gas Magazine is dedicated as a memorial. In other pages will be found accounts of his life, which will be read with interest and give that inspiration which comes from contemplating the life of a man who has lived with honor."

A brief resume of those things which filled the life of Mr. Reeser with stimulation were those recounted by Mr. Brown, as follows:

"Mr. Reeser was born and grew to young manhood at Pottstown, Pa., and was educated in the public schools. When still a young man he went to Oil City, where he was connected with the Western Union Telegraph Company, and took the Associated Press reports. He had the distinction of having taken the first press reports from a wire on a typewriter. He

You can lessen pain and suffering by backing up the Red Cross.

was also one of the first operators to take messages from the wire by ear, discarding the old method of using a strip of tape. In 1887 he became connected with the Oil City Fuel Supply Company in the capacity of accountant.

"It was while in the employ of this company he gained his knowledge of natural gas, and in later years became one of the most prominent men in the industry and a recognized authority in that branch of the industry. It was while connected with this company that he, in company with the late F. H. Oliphant, visited Alaska, where they engaged in extensive research work. Upon his return from this trip he became identified with the Triple State Gas Company and remained with it for two years and then accepted a position with the Citizens Traction Company of Oil City and was active in extending the lines to Franklin.

"In December, 1901, Mr. Reeser came to Pittsburgh at the solicitation of Messrs, Trett & Crawford and took charge of their growing gas interests. Later, under his direction, these interests were merged into The Ohio Fuel Supply Company, which has been constantly expanding until at the present time it has become one of the largest in the United States. At the time of his death he also held the position of secretary of the Tropical Oil Company, Assistant to President and secretary of The Ohio Fuel Supply Company; secretary, Ohio Fuel Oil Company; secretary and treasurer, Northwestern Ohio Natural Gas Company; secretary and treasurer, Pennsylvania Fuel Supply Company; secretary of the Ohio Fuel Oil Company, and vice president and general manager of the Fayette County Gas Company, and a director in the Ohio Fuel Supply Company. He was a member of the Herron Hill Gun Club, Pittsburgh Athletic Association, the Union Club Connellsville Game Preserve, and Clear Creek Hunting and Fishing Club.

"One of those who has long been associated with Mr. Reeser says: 'One outstanding factor in his success was his untiring effort in studying the underlying principles of all problems with which he came in contact. He studied the works of nature and the woods and all like associations were to him a source of never-ending pleasure. To those under him as business associates he was a true and loyal friend; to those for whom he labored, Mr. Treat and Mr. Crawford, he was all devotion to their interests and the memory of Harry Reeser will be a lasting inspiration to all who knew him.'

"Mr. Reeser leaves his wife, and two sons, Frank B. Reeser, of Piqua, Ohio, and Norman, at home; also his mother and one sister residing at Pottstown, Pa., and three brothers, Edward Reeser of Pittsburgh, Warren Reeser of Huntington, W. Va., and John Reeser of Harrisburg, Pa. The family home is at College and Home streets. Mr. Reeser was 54 years old."

The funeral service and interment took place in Oil City.

PRODUCTION AND TRANSPORTATION OF GAS.

THE following report was prepared by George E. Taylor, Assistant Engineer of the Public Service Commission of West Virginia, and placed before the commission under recent date.

The compilation is for the year ending December 1st, 1917, and is accomplished from the reports sent in each month by different utilities as required in the Commission's rule No. 21.

Produced by gas utilities	251,935,229,000	cu. ft.
Produced by producers	38,746,414000	"
Produced by carbon black companies not included above (estimated)	14,583,283,000	"
TOTAL PRODUCED (a)	305,264,926,000	"
Consumed domestic and industrial	52,258,468,000	"
Consumed field and main lines	22,924,291,000	"
Consumed for carbon black (estimated)	26,062,706,000	"
TOTAL CONSUMED	101,245,465,000	"
Transported out of State	208,280,274,000	"
Transported into State	4,024,818,000	"
NET TRANSPORTED OUT OF STATE	204,255,456,000	"

(a) It is estimated that 26,062,706,000 cu. ft. was used for the manufacture of carbon black.

Commenting on the above figures, it is to be noted that the volume of natural gas produced commercially in West Virginia in 1917 established a new record of gas production, a gain of 2% over the output for the year 1916, as shown by the records of the United States Geological Survey.

There is a discrepancy of 235,995,000 cu. ft. between the amount shown as exported out of the State and the difference between production and consumption within the State. The amount reported as purchased by utilities from other utilities differs from the amount reported as sold by utilities to other utilities by this same figure, which represents only about 1/8 of one percent of the amount shown as exported and about 1/2 of one percent of the amount shown as produced. This discrepancy should most likely be deducted from the amount shown as consumed in field and main lines.

SAILING LAKE ERIE

The opening trip of the magnificent steamers plying Lake Erie between Buffalo and Cleveland took place on May 1st, and from that date on through the season the steamers will leave Buffalo at 8:00 P. M. each evening, standard central time, arriving in Cleveland 7:00 A. M. The reverse trip Cleveland to Buffalo is made each day, boat leaving Cleveland at 8:00 P. M., standard central time, arriving in Buffalo at 6:30 A. M. Fare one way $3.52, round trip $6.02. A special automobile rate for tourists is made as follows: $7.50 round trip for automobile not exceeding 127 inches wheel base. Return limit two days.

Boost for Red Cross War Fund Week May 20-27th.

Efficiency on Reduced Pressure

Statement of Claims on Method of Operating on Reduced Pressure Together with Copy of Register of Assignments Laid Before the Field by W. O. Felt, M. E.

THE following communication was recently received at the editorial office of THE NATURAL GAS AND GASOLINE JOURNAL. The letter and specifications that follow will be read with much interest.

The whole is printed as presented to us by Mr. W. O. Felt, of New York City, we claiming no knowledge of the facts of the case other than as offered by Mr. Felt in his communication which is published as from a subscriber.—Editor's Note.

April 27, 1918.

Editor, Natural Gas and Gasoline Journal,
Buffalo, N. Y.

Dear Sir:

I noticed in "Natural Gas and Gasoline Journal" of September, 1917, an article on "Efficiency on Reduced Pressure," page 244, marked patent pending.

The process and apparatus set forth in the article appears to me to be included with the process and apparatus disclosed in my Canadian patent No. 126,144, dated June 7th, 1910, of which I enclose copy of specification, in part, with claims in connection therewith, for your careful consideration.

After I had filed application in Canada I learned that the process had been previously disclosed in a book published in 1906 entitled "Compend of Mechanical Refrigeration and Engineering" by J. E. Siebel, see page 479 of the book, where there are several examples on Natural Gas expanding adiabatically for the purpose of refrigeration and ice-making. On account of this I did not file application in the United States and other foreign countries.

I also enclose Canada abstract from Register of Assignments referring to Patent No. 126,144, and call attention to the fact that the abstract shows that as early as 1910 A. J. Paris, Jr., appears as one of the assignees of record of the Canadian patent above mentioned.

In 1908 Paris and myself incorporated the Petroleum Products Co. for the purpose of exploiting and developing my processes for extracting Gasoline from Natural Gas, and for compressing, purifying, drying and cooling air and gases respectively.

In 1909 I installed an expansion engine at the plant of the Petroleum Products Co., at Bingham, Pa., to be operated by the compressed natural gas, so as to utilize the exhaust therefrom to effect the desired refrigeration; thereby condensing the gasoline from the natural gas instead of using water for that purpose.

In view of the above facts you will see that Paris's claim as the alleged original inventor are not borne out by the facts.

In view of the publicity accorded to the article in question I deem it no more than right, in the public interest, to request you to lay the above facts before your readers.

Yours very truly,
W. O. FELT.

CANADIAN PATENT SPECIFICATION NO. 126,144, DATED JUNE 7, 1910.

Specification.

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN THAT I, WILLARD OLIVER FELT, of 274 West 140th Street, in the City of New York, in the State of New York, having invented certain new and useful improvements in Methods of Treating Aëriform Fluids upon Compression, do hereby declare that the following is a full, clear and exact description of the same.

The compression of Aëriform fluid, is attended with heat and to take this up, it has been found necessary to cool the compression cylinder.

I cool the aëriform fluid directly by presenting to it, while under compression, a substance which will, of itself, absorb and abstract the heat,—in effect prevent heating—and also purify it and absorb any moisture in it contained.

To this end, I have employed glycerine; but I now find that I may employ Turkey-red oil, and this with certain advantages. In addition, I have discovered that, in the employment of any liquid substance, which, directly presented to the fluid under compression, will abstract its heat, I can entirely separate any vapor therefrom by refrigeration; and, finally, that I can employ the compressed fluid used expansively to effect the desired refrigeration.

To carry my invention into effect, I compress any desirable aëriform fluid in a suitable compressor and, simultaneously present to it, as by injection, and thus in a finely divided condition, Turkey-red oil, and the effect of this is, that the oil, coming into intimate contact with the aëriform fluid, at once abstracts its heat, absorbs any aqueous vapor in it contained, and purifies it.

Instead of artificially compressing the aëriform fluid, I may take the same, as natural gas, direct from the earth at rock pressure.

From the compressor, I discharge the gas into a pressure-and-separating-tank, where the Turkey-red oil subsides, carrying with it any aqueous vapor and impurities, and the gas is led off to a storage-tank or receiver.

From the receiver, the aëriform fluid takes two directions and performs, and is subjected to, two different functions: A minor quantity of this fluid passes to the expansion-cylinder of the compressing-engine, aiding the steam or other power, and, thence escaping, passes. by a suitable conduit, to a condensing-tank, which is, preferably, of a kind arranged with a number of vertical tubes opening at their ends into chambers at its top and bottom, the expanded aëriform fluid passing around the outside of the tubes. The major portion of the fluid passes into the upper chamber of the condensing-tank, thence, through the tubes, to the lower chamber, and, thence, to any desired place of use; the effect of the expanded aëriform fluid passing around the tubes being to lower the temperature so greatly, in fact, carrying it below zero Fahrenheit, that any liquefiable substance, such as gasoline, contained in the fluid passing through the tubes, is condensed and flows out from the lower chamber to a suitable vessel.

It will be understood, that the expansion-cylinder and condensing-tank and all other parts, where desirable, will be heat-insulated.

The Turkey-red oil may be used over and over again, until desirable to free it from impurities, and each time, may be cooled before injecting into the compression-cylinder.

In treatment of the Turkey-red oil to free it from other matter, many valuable by-products will be recovered.

What I claim and desire to secure by Letter-Patent, is:

1. The method of preventing the usual heating of an aëriform, or gaseous, fluid, while undergoing compression, which consists, in subjecting the same to the action of Turkey-red oil, substantially as described.

2. The method of preventing the usual heating of an aëriform fluid while undergoing compression and. at the same time, purifying it, which consists in injecting into it Turkey-red oil, substantially as set forth.

3. The method of preventing the usual heating of an aëriform fluid while undergoing compression and. at the same time, purifying it and freeing it from any aqueous vapor present, which consists in injecting into it Turkey-red oil, substantially as specified.

4. The method of condensing and separating hydrocarbon, or other vapor, such as gasoline-vapor, and so forth, from a gaseous fluid which consists in refrigerating the fluid to a temperature below zero, substantially as and for the purpose described.

5. The method of condensing and separating hydrocarbon, or other vapor, such as gasoline-vapor, and so forth, from a gaseous fluid, by refrigeration, which consists in permitting compressed, cool aëiform fluid to expand, as in supplying power for an engine, and on exhaust therefrom employing it, then, to abstract heat from the gaseous fluid.

WILLARD OLIVER FELT.

New York, N. Y., January 29th, 1910.

SIGNED IN PRESENCE OF:

RICHARD LILTON EDWARDS.

CHARLES QUACKERBUSH FREEMAN.

ABSTRACT FROM REGISTER OF ASSIGNMENTS.

No. or Assignment.	Assignor	Assignee.	Date of Assignment.
59930	W. O. Fellt	A. J. Paris, Jr.	Sept. 18, 1908
61411	W. O. Fellt	R. S. Walker, Trustee	Nov. 1, 1910
62604	Stone Gundy & Brackin, Plaintiffs	R. S. Walker, Trustee Defendant	Feb. 18, 1911
62604½	J. R. Gemmill, Sheriff	A. Park	March 1, 1911
63977	C. L. Bisnett, Plaintiff	A. Park, Defendant	July 24, 1911
64008	A. Park	R. L. Brackin	July 25, 1911
64683	R. L. Brackin	C. L. Bisnett	July 27, 1911
64684	C. L. Bisnett	J. B. Detwiler	Sept. 22, 1911

Date of Record	No. of Patent	Title	Territory Assigned. Agreement.
May 30, 1910	126144	Methods of treating acriform fluids upon compression	
Nov. 5, 1910	"	"	All interest.
Mar. 23, 1911	"	"	Writ.
Mar. 23, 1911	"	"	All Interest.
July 27, 1911	"	"	Copy of writ.
July 31, 1911	"	"	All interest.
Oct. 10, 1911	"	"	License County of Brant.
Oct. 10, 1911	"	"	All his interest.

Department of Agriculture, Patent Office, Ottawa, Canada.
ABSTRACT from Register of Assignments referring to Patent No. 126144.
GEO. F. O'HALLORAY,
Deputy Commissioner of Patents.
Nov. 20th, 1912.

PREACH OPTIMISM AND WIN THE WAR

Henry L. Doherty said, "I know of no other way in which to thoroughly discourage the war work in the United States as by giving currency to assertions that the Government is not getting along in its preparations, and that profiteering is rampant," said Henry L. Doherty on April 17, in an address before members of the New York organization at the Reform Club, the occasion being the last monthly dinner until autumn. "We must dwell on the actual truth of the situation, and that means preaching optimism and the result will be a united country."

Fight if you can—if you can't fight, give all you can.

Flow of Gas in Pipes

Dependable Data on Piping for Low and High Pressure.

As a matter of convenience to our gas-men, we are herewith printing data that is absolutely dependable, such having been gathered by careful research and appearing collectively in the Handbook of the National Tube Company. It is reprinted by permission.—The Editor.

THE following formulæ are intended for low-pressure distribution of gas, with comparatively small differences between the initial and final pressures.

Pole's Formula, $Q = 1350\sqrt{\frac{d^5h}{sl}}$

Molesworth's Formula, $Q = 1000\sqrt{\frac{d^5h}{sl}}$

Gill's Formula, $Q = 1291\sqrt{\frac{d^5h}{s(l+d)}}$

Where Q=quantity of gas discharged in cubic feet per hour.
d=inside diameter of pipe in inches.
h=pressure in inches of water.
s=specific gravity of gas, air being 1.
l=length of main in yards.

The formula of Gill is said to be based on experimental data, and to make allowance for obstructions by tar, water, and other bodies tending to check the flow of gas through the pipe.

An experiment made by Mr. Clegg, in London, with a 4-inch pipe, 6 miles long, pressure 3 inches of water, specific gravity of gas 0.398, gave a discharge into the atmosphere of 852 cubic feet per hour, after a correction of 33 cubic feet was made for leakage. Substituting this value for Q in the formula $Q=C\sqrt{\frac{d^5h}{sl}}$, we find the coefficient C to be 997, which corresponds very closely with the formula given by Molesworth.

MAXIMUM SUPPLY OF GAS THROUGH PIPES IN CUBIC FEET PER HOUR, SPECIFIC GRAVITY BEING TAKEN AT 0.45. CALCULATED FROM THE FORMULA

LENGTH OF PIPE=10 YARDS.

Inside diameter of pipe in inches	Pressure by the water gage in inches									
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
⅜	13	18	22	26	29	31	34	36	38	41
½	26	37	46	53	59	64	70	74	79	83
¾	73	103	126	145	162	187	192	205	218	230
1	149	211	258	298	333	365	394	422	447	471
1¼	260	368	451	521	582	638	689	737	781	823
1½	411	581	711	821	918	1006	1082	1162	1232	1299
2	843	1192	1460	1686	1886	2066	2231	2385	2530	2667

LENGTH OF PIPE=100 YARDS.

Inside diameter of pipe in inches	Pressure by the water gauge in inches										
	0.1	0.2	0.3	0.4	0.5	0.75	1.0	1.25	1.5	2.0	2.5
½	8	12	14	17	19	23	26	29	32	36	42
¾	23	32	42	46	51	63	73	81	89	103	115
1	47	67	82	94	105	129	149	167	183	211	236
1¼	82	116	143	165	184	225	260	291	319	368	412
1½	130	184	225	260	290	356	411	459	503	581	649
2	267	377	462	533	596	730	843	943	1033	1193	1333
2½	466	659	807	932	1042	1276	1473	1647	1804	2083	2329
3	735	1039	1270	1470	1643	2012	2323	2598	2846	3286	3674
3½	1080	1528	1871	2161	2416	2958	3416	3820	4184	4831	5402
4	1508	2133	2613	3017	3373	4131	4770	5333	5842	6746	7542

LENGTH OF PIPE=1000 YARDS.

Inside diameter of pipe in inches	Pressure by the water-gauge in inches						
	0.5	0.75	1.0	1.5	2.0	2.5	3.0
1	33	41	47	58	67	75	82
1½	92	113	130	159	184	205	226
2	189	231	267	327	377	422	462
2½	329	403	466	571	659	737	807
3	520	636	735	900	1039	1162	1273
4	1067	1306	1508	1847	2133	2385	2613
5	1863	2282	2635	3227	3727	4167	4564
6	2939	3600	4157	5091	5879	6573	7200

LENGTH OF PIPE=5000 YARDS.

Inside diameter of pipe in inches	Pressure by the water-gauge in inches				
	1.0	1.5	2.0	2.5	3.0
2	119	146	169	189	207
3	329	402	465	520	569
4	675	826	955	1 067	1 168
5	1 179	1 443	1 667	1 863	2 041
6	1 859	2 277	2 629	2 939	3 220
7	2 733	3 347	3 865	4 321	4 734
8	3 816	4 674	5 397	6 034	6 610
9	5 123	6 274	7 245	8 100	8 873
10	6 667	8 165	9 428	10 541	11 547
12	10 516	12 880	14 872	16 628	18 215

Dr. A. C. Humphreys says his experience goes to show that these tables give too small a flow, but it is difficult to accurately check the tables, on account of the extra friction introduced by rough pipes, bends, etc. For bends, one rule is to allow 1/42 of an inch pressure for each right-angle bend.

Where there is apt to be trouble from frost it is well to use no service of less diameter than ¾ inch, no matter how short it may be. In extremely cold climates this is now often increased to 1 inch, even for a single lamp. The best practice in the United States now condemns any service less than ¾-inch.

TABLE SHOWING THE CORRECT SIZES OF HOUSE PIPES FOR DIFFERENT LENGTHS OF PIPES AND NUMBER OF OUTLETS.

(Denver Gas and Electric Company.)

Length of pipe in feet

Number of outlets	⅜-inch pipe	½-inch pipe	¾-inch pipe	1-inch pipe	1¼-inch pipe	1½-inch pipe	2-inch pipe	2½-inch pipe	3-inch pipe
1	20	30	50	70	100	150	200	300	400
2	..	27	50	70	100	150	200	300	400
3	..	12	50	70	100	150	200	300	400
4	..	..	50	70	100	150	200	300	400
5	..	..	33	70	100	150	200	300	400
6	..	..	24	70	100	150	200	300	400
8	..	..	13	50	100	150	200	300	400
10	..	..	..	35	100	150	200	300	400
13	..	..	..	21	60	150	200	300	400
15	..	..	..	16	45	120	200	300	400
20	..	..	..	..	27	65	200	300	400
25	..	..	..	..	17	42	175	300	400
30	..	..	..	..	12	30	120	300	400
35	..	..	..	..	..	22	90	270	400
40	..	..	..	..	..	17	70	210	400
45	..	..	..	..	..	13	55	165	400
50	..	..	..	..	..	..	45	135	330
65	..	..	..	..	..	..	27	80	200
75	..	..	..	..	..	..	20	60	150
100	..	..	..	..	..	..	..	33	80
125	..	..	..	..	..	..	..	22	50
150	..	..	..	..	..	..	..	15	35
175	..	..	..	..	..	..	..	..	28
200	..	..	..	..	..	..	..	..	21
225	..	..	..	..	..	..	..	..	17
250	..	..	..	..	..	..	..	..	14

In this table the quantity of gas the piping may be called on to convey is stated in terms of ⅜-inch outlets on the assumption that each outlet requires a supply of 10 cubic feet per hour. The aim of the table is to have the loss in pressure not exceed 1/10 inch water pressure in 30 feet.

In using the table the following rules should be observed:

In figuring out the size of pipe, always start at the extremities of the system and work toward the meter.

Gas should not be supplied from a smaller to a larger size pipe.

If the exact number of outlets given cannot be found in the table, take the next larger number. For example, if 17 outlets are required, work with the next larger number in the table, which is 20. Or, if, for the number of outlets given, the exact length which feeds these outlets cannot be found in the table, the next larger length corresponding to the outlets given must be taken to determine the size of pipe required. Thus if there are 8 outlets to be fed through 55 feet of pipe, the next larger than 55 in the 8 outlet line in the table, which is 100, should be used. As this is in the 1¼-inch column, that size pipe would be required.

For any given number of outlets, a smaller size should not be used than the smallest size that contains a figure in the table for that number of outlets. Thus, to feed 15 outlets, no smaller size pipe than 1 inch may be used, no matter how short the section of pipe may be.

In any continuous run from an extremity to the meter, there may not be used a longer length of any size pipe than found in the table for that size, as 50 feet of ¾-inch, 70 feet of 1-inch, etc. If any one section would exceed the limit length, it must be made of larger pipe.

If any outlet is larger than ⅜-inch it must be counted as more than one, in accordance with the following table:

Size of outlet (inches)	½	¾	1	1¼	1½	2	2½	3
Value in table	2	4	7	11	16	28	44	64

High Pressure.

The formulæ given do not take account of the varying density and volume of the gas when subjected to different pressures; they are applicable, therefore, only to low-pressure distribution where the difference in pressure is measured in inches of water head. Under the vastly different conditions connected with high pressure distribution, where the differences between initial and final pressures are so great as to cause a material alteration in the volume of the gas, the error involved in their use is great.

Mariotte's law states that the volume of a gas varies inversely with the pressure to which it is subjected. If the pressure be doubled the gas will be compressed to half its former volume. When we consider the high pressure at which gas is now being distributed in many places, we may appreciate the disturbances which this degree of compression introduces into a formula designed for use under far different conditions.

Then there is also the process of expansion continually going on, the volume increasing as the gas travels farther away from the point at which the initial pressure is applied. Suppose a quantity of gas is passed through a pipe at an initial pressure of 20 pounds per square inch and discharged at 1 pound per square inch, the consequential expansion represents a certain amount of work, and this factor must, in all cases, be taken into account, to whatever degree it has been operating.

The common form of the formula for flow of gas in long pipes under high pressure is

$$Q = c\sqrt{\frac{(P_1^2 - P_2^2)\, d^5}{ls}}$$

where Q = discharge in cubic feet per hour at atmospheric pressure.
s = specific gravity of gas, air being 1.
c = coefficient, which is variously given in different formulae.
P_1 = absolute initial pressure in pounds per square inch.
P_2 = absolute final pressure in pounds per square inch.
d = inside diameter of pipe in inches.
l = length of pipe line in feet.

The expression $(P_1^2 - P_2^2)$ may be replaced by $(P_1 + P_2)(P_1 - P_2)$.

William Cox (Am. Mach., Mar. 20, 1902) gives the formula in the form

$$Q = 3000\sqrt{\frac{(P_1^2 - P_2^2)\, d^5}{l}} \text{ when } s = 0.65$$

E. A. Rix, in a paper on the "Compression and Transmission of Illuminating Gas," read before the Pacific Coast Gas Association, 1905, gives for the discharge per minute:

$$q = \frac{44.66}{\sqrt{s}}\sqrt{\frac{(P_1^2 - P_2^2)}{l}\, d^5}$$

from which the discharge per hour would be

$$Q = \frac{2680}{\sqrt{s}}\sqrt{\frac{(P_1^2 - P_2^2)}{l}\, d^5}$$

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Gas Appliance Co., Cleveland.
Gas Record, Chicago.
General Fire Ext'g'r Co., Providence.
General Gas Light Co., Kalamazoo.
Germer Stove Co., Erie.
Gilfillan Machine Works, Ebenezer, N. Y.
Goodrich, B. F. Co., Akron, O.
Graves Supply Co., Cincinnati.
Guardian Gas Appliance Co., The, Cleveland, Ohio.
Gwynn Gas Burner & Eng. Co., Pittsburgh.

Hammon Coupler Co., Pittsburgh.
Haymond Co., Muncie, Ind.
Hays Mfg. Co., Erie.
Hart Mfg. Co., Cleveland.
Hazard Mfg. Co., Chicago.
Heeter, C. M. Sons & Co., Inc., Butler, Pa.
Hewitt Rubber Co., Pittsburgh.
Hooven, Owens, Rentschler Co. Hamilton O.
Hope Engineering & Supply Co. Pittsburgh.

Ideal Heating Co., The, Columbus.
Imperial Belting Co., Chicago, Ill.
Ingersoll-Rand Co., Pittsburgh.
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Jarecki Mfg. Co., Erie.
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Jones & Laughlin Steel Co., Pittsburg, Pa.

LaBelle Iron Works, Steubenville, O.
Lattimer-Stevens Co., Columbus, Ohio.
Leschen, A. & Sons Rope Co., St. Louis.
Lezius Automatic Draft Reg. Co., Cleveland.
Lucey Mfg. Corp., Pittsburgh.
Ludlow Valve Mfg. Co., Pittsburgh.

Macomber & Whyte Rope Co., Chicago.
Manhattan Rubber Mfg. Co., Passaic, N. J.
Mark Mfg. Co., Chicago.
Maxon Premix Burner Co., Muncie, Ind.
Meek Oven Mfg. Co., Newburyport, Mass.
Metric Metal Works, Erie.
Minneapolis Heat Reg. Co., Minneapolis.
Modern Iron Wks., Quincy, Ill.
Modern Safety Iron Co., Philadelphia.
Moon Mfg. Co., The, Chicago.
Moore, Lee C. & Co., Inc., Pittsburgh.
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Mueller H. Mfg. Co., Decatur, Ill.

Nathan Mfg. Co., New York City.
National Supply Co., Pittsburgh.
National Transit Pump & Mach. Co., Oil City, Pa.
National Tube Co., Pittsburgh.
Natural Gas & Gasoline Journal, Buffalo.
New Bedford Cordage Co., New York City.
New York Belt'g & Pack'g Co., New York.
Nye, A. T. & Son Co., Marietta, O.

Oil & Gas Journal, Tulsa, Okla.
Oil City Boiler Wks., Oil City, Pa.
Oil Trade Journal, New York.
Oil Well Supply Co., Pittsburgh.
Oxweld Acetylene Co., Chicago.

Parkersburg Mach. Co., Parkersburg, W.Va.
Parkersburg Rig & Reel Co., Parkersburg, W. Va.
Peerless Heater Co., Pittsburgh.
Pennsylvania Furnace & Stove Co., Warren, Pa.
Pittsburg Meter Co., East Pittsburg.
Pittsburg Reinforced Brazing & Mach. Co., Pittsburgh.
Pittsburg Valve & Fittings Co., Pittsburgh.
Pittsburg Valve, F'd'y & Const. Co., Pittsburgh.
Pittsburgh Water Htr. Co., Pittsburgh.
Plymouth Cordage Co., N. Plymouth, Mass.
Pratt & Cady Co., Inc., New York City.
Prichard Supply Co., Mannington, W. Va.

Rathbun-Jones Eng. Co., Toledo.
Reid, Jos. Gas Engine Co., Oil City, Pa.
Reliable Stove Co., Cleveland.
Republic Iron & Steel Co., Youngstown, O.
Revere Rubber Co., Chelsea, Mass.
Reznor Mfg. Co., Ltd., Mercer, Pa.
Riesenman Mfg. Co., Ltd., Franklin, Pa.
Robinson, J. E. & Co., Oil City, Pa.
Robinson Packer & Mach. Co., Coffeyville, Kansas.
Roebling, John A. Sons Co., Trenton, N. J.
Rossendale-Reddaway Belt'g & Hose Co., Newark, N. J.
Ruud Mfg. Co., Pittsburgh.

Sanitary Co. of America, Linfield, Pa.
Schaeffer & Budenberg Mfg. Co., Pittsburgh.
Scientific Heater Co., The, Cleveland, Ohio.
Selas Co., Canton, O.
Solar Light Co., New York City.
South Chester Tube, Chester, Pa.
Spang, Chalfant & Co., Pittsburgh.
Sprague Meter Co., Bridgeport, Conn.
Strause Gas Iron Co., Philadelphia.
Superior Gas Engine Co., Springfield, O.

Tate-Jones & Co., Inc., Pittsburgh.
Taylor, W. P. Co., Buffalo.
Toledo Pipe Thr'd'g Mach. Co., Toledo, O.
Troop Mfg. Co., Pittsburgh.

United Seal Co., Columbus.
Utica Valve & Fixture Co., Utica, N. Y.

Welsbach Co., Gloucester City, N. J.
Westinghouse Mach. Co., Pittsburgh.
Westinghouse Electric & Mfg. Co., Pittsburgh.
Wheeling Steel & Iron Co., Wheeling.
Wolfe, Linden W., Oil City, Pa.
Worthington Pump & Mach. Corp., Buffalo.
Wright Wire Co., Worcester, Mass.

Youngstown Sheet & Tube Co., Youngstown, O.

ANNUAL CONVENTION NATURAL GAS ASSOCIATION OF AMERICA—May 22-23, at William Penn Hotel, Pittsburgh, Pa.

found that these disturbing influences vary to a great extent with the character of the bend. The resistance offered is least when the radius of the bend is equal to five times the radius of the pipe. The most convenient way of stating the resistance offered by bends is in terms of equivalent length of straight pipe which offers the same resistance to flow as the extra resistance due to the bend. A formula given for this equivalent length is

$$L = 12.85 \left(\frac{r}{R}\right)^{0.83} l,$$

where L = equivalent length in feet.
r = radius of pipe.
R = radius of curve.
l = length of curve in feet measured along the center line.

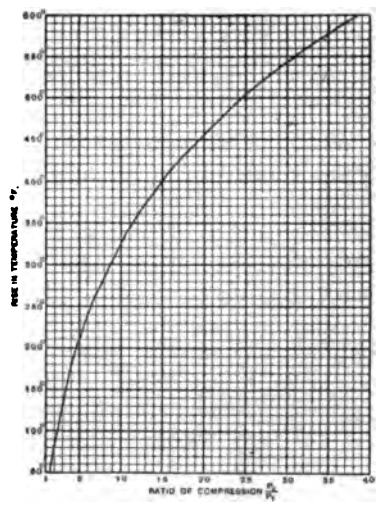
The resistance of a bend whose radius is five times the radius of the pipe, that is $\frac{R}{r} = .2$, is equal to the resistance of 3.38 l.

The reduction of pressure produced by elbows, tees and globe valves is also taken account of by the addition of an equivalent length to the length of straight pipe. The following table shows the additional length required to equal the friction due to globe valves. For elbows and tees take ⅔ of the value given in the table.

Diameter of pipe in inches	Additional length in feet	Diameter of pipe in inches	Additional length in feet
1	2	7	44
1½	4	8	53
2	7	10	70
2½	10	12	88
3	13	15	115
3½	16	18	143
4	20	20	162
5	28	22	181
6	36	24	200

ADIABATIC COMPRESSION OF NATURAL GAS.

The following table and the curve give the rise in temperature due to the adiabatic compression of natural gas. P_1 is the absolute initial and P_2 the absolute final pressure,



$\frac{P_2}{P_1}$ being therefore the ratio of compression. The initial temperature of the gas is assumed to be 60° F.

$\frac{P_2}{P_1}$	Rise in temperature °F.	$\frac{P_2}{P_1}$	Rise in temperature °F.	$\frac{P_2}{P_1}$	Rise in temperature °F.
1.	0°	6.	238°	14.	386°
1.5	47	6.5	251	16.	412
2.	82	7.	263	18.	435
2.5	110	7.5	274	20.	456
3.	135	8.	285	25.	503
3.5	157	8.5	296	30.	543
4.	177	9.	305	35.	578
4.5	194	10.	324	40.	609
5.	210	11.	341	45.	638
5.5	224	12.	357	50.	664

A NATION UPON A FIRM FOUNDATION

MR. Harold G. Moulton at Union League Club, Tacoma, recently said:

"The government is urging us to save as never before; and to save with a view to the elimination of nonessential industries. The Liberty Loan Committee states:

Luxuries and extravagance must go completely out of fashion—should, in fact, be considered little short of treachery. . . . . There is not enough capital, labor, transportation, or raw material to go around, if those industries which are not essential to the conduct of war are continued at their normal productiveness. Every unessential industry which continues in operation must be considered as bidding against the nation for its life's blood. . . . . Every unessential industry which burns coal deprives the essential industries by just so much of the supply available for their purposes. Every man who buys a new overcoat is bidding against Uncle Sam, who is buying overcoats for soldiers. And every dollar spent on a luxury is helping to support an unessential industry in the competitive consumption of essentials."

—Economic World.

The results of all this will be far-reaching. We shall find ourselves a nation built upon a rock, that rock being economy, thrift, saving, etc. Such conditions, with our banking system of today what it is, should establish us as a nation which no storms of business disaster, that in former years at times threatened destruction could more than jar, much less seriously affect.

We had become an extravagant nation. The world was extravagant, and was becoming more so, with the possibility of a tremendous crash at some future time. That crash has been averted, and our children and our children's children will see prosperity, and a form of life worth living, far above and beyond the fictitious pleasures such as in the recent past we have inclined to believe were real pleasures based upon eyhorbitant, foolish expenditures, the striving after popularity through vast wastefulness, etc. Great and satisfactory will be the future.

Give liberally to the Red Cross.

PRESIDENT OF VAST CORPORATION.

THE recent election of Charles Philip Coleman as President of the Worthington Pump and Machinery Corporation especially directs attention to this large industrial enterprise and s new executive—who has had an experience which ceptionally fits him for the responsibilities of his w office.

Mr. Coleman advances from the position of Vice resident, held since May, 1916. Prior to 1916 he as Receiver of the International Steam Pump Comny and Associate Companies which reorganized form e present Corporation, which is owner of and controls me of the best equipped works in the country, and is a ading interest in pumping machinery and affiliated es.

Mr. Coleman was born in Baltimore, is of English scent. His forefathers settling in this country dur- Colonial times.

CHARLES PHILIP COLEMAN.
President, Worthington Pump & Machinery Corp.

Mr. Coleman's education was begun in Baltimore and continued at the Virginia Military Institute and the Shenandoah Valley Academy at Winchester. Later he entered Lehigh University, from which he graduated with the degree of M. E.

After leaving the University Mr. Coleman entered the employ of the Lehigh Valley Railroad Company, holding the various positions of Car Agent, Chemist, Engineer of Tests, Assistant to General Superintendent and General Storekeeper, until 1903. He then went with the Bethlehem Steel Company became Purchasing Agent and Assistant to the President, but later was made General Purchasing Agent of the Lehigh, with headquarters in New York, following which the Singer Sewing Machine Company made Mr. Coleman its Secretary and Treasurer, and during his incumbency of this position he had charge of the construction of the Singer Building, which was at that time a most important and unusual undertaking and remains one of the most conspicuous buildings in New York City.

After leaving the Singer Company Mr. Coleman became President of the Saurer Motor Company and later the International Motor Company, from which connection he came to the International Steam Pump Company in 1913 as Vice President, and upon the outbreak of the war in 1914 was made one of the co-receivers of the company, which had been compelled to go into the Federal Courts because of its financial difficulties, brought about by the war conditions.

Mr. Coleman became sole receiver of the company in 1915, due to resignation of his associate receiver, Mr. Grayson M. P. Murphy, in which capacity he handled its affairs until reorganization in 1916. This service was so satisfactory as to have secured the warm commendation of the United States Court. After the reorganization into the present Worthington Pump and Machinery Corporation, the Vice-Presidency was again given to Mr. Coleman, and he continued in that position until his recent election as President.

Mr. Coleman's two sons are both serving in the U. S. Army, one as Captain, Third U. S. Field Artillery, and the other as Lieutenant, Aviation Section of Signal Corps.

The Worthington Pump and Machinery Corporation has been and is now very active in its service to the Government, covering large and important lines of product. The Corporation, having eight large works in this country and a European works, is in an unusually good position to be of great assistance to both the United States and its Allies, and the equipment and size of its various works have permitted of taking on responsibilities amounting to millions for war work, and yet handle its heavily increased regular business satisfactorily.

While the principal business of the Corporation is pumping machinery in all its varied types and developments, yet the capacity of its shops is such that the war work referred to has been handled in most satisfactory shape and still other and promising lines of regular manufacture added.

The standard products, aside from pumping machinery, cover mining and concentrating machinery, oil and gas engines, air compressors, gas power engines and blowers, crushing and cement equipment, water works engines and special machinery.

The number of works now operated in the United States by the Corporation is eight, as follows:

1. The great Worthington Works at Harrison, N. J., which is the largest plant in the world, devoted exclusively to the manufacture of pumping machinery.

2. The Blake & Knowles Works at East Cambridge, Mass., now entirely rebuilt and producing principally marine pumps.

3. The Deane Works at Holyoke, Mass., which manufactures power pumps only.

4. The Snow-Holly Works at Buffalo, N. Y., building the largest machines required in water works, blowing and gas power engines and oil engines.

5. The Power & Mining Machinery Works at Cudahy, Wis., which, as its name indicates, gets out a complete line of crushing, concentrating and mining equipment.

6. The Laidlaw Works at Cincinnati, Ohio, given over to air compressing machinery only.

7. The Jeansville Works at Hazleton, Pa., working at present on special product.

8. The International Gas Engine Works at Cudahy, Wis., making a full line of gas and oil engines and accessories.

The high reputation of the Worthington product, taken in connection with its widespread scope in manufacturing and sales and with additional lines being added, places it in the forefront as one of the most important industrials of the day.

OIL STORAGE TANKS AND RESERVOIRS.

THE Bureau of Mines, Department of the Interior, has in Bulletin No. 155 set forth various important features in connection with oil storage tanks and reservoirs, with a brief discussion of losses of oil in storage and methods of prevention. The report is by C. P. Bowie, Petroleum Engineer of the Bureau.

The facts brought to the fore, will be found of exceeding interest, and what has been said upon these matters of especial value. The matters are timely, in view of the attempts that are being made to avoid all waste, and to get the most out of everything.

The conclusions are briefly summarized as follows:

The best all-round container in use at the present time for storing oil is the all-steel tank of gas-tight construction.

Tanks that are used for the accumulation of fresh oils from the well should invariably be of this construction, and as a rule it will probably pay to equip them with water-seal tops, if not also with some form of tile encasing or lagging.

Other devices for lessening the temperature of the oil in the tanks that can be cheaply applied and economically maintained, such as sprinkling with water in hot weather and painting the tanks white, are worth while.

To store gasoline or light distillate in tanks that have not tight tops is the height of folly, and it is poor judgment not to use some type of cooling device.

Large concrete-lined reservoirs, as at present constructed, should not be used for the storage of fresh oils or of light oils.

It will pay to line a reservoir with concrete even though heavy oil only is to be stored.

In most cases it would probably pay to put a concrete roof on the reservoir and cover it with earth—at least such a type of structure is worthy of consideration, regardless of the gravity of the oils to be handled.

Concrete, if properly proportioned, mixed, poured, tamped, and floated can be made impervious to heavy oils without the addition of so-called "oil-proofing" compounds.

Contrary to popular engineering opinion, expansion joints are not necessary in properly constructed concrete linings for oil reservoirs in temperate climates, and no injury will result to the linings from their omission if the reservoirs be kept reasonably full of oil, or if, when the tanks are not in use, they are kept partly filled with water.

If crude can be refined at any profit, it should be put through the refinery as soon as possible after it is taken from the wells. If refining will not pay, the period of storage should be as short as possible because, so far as the oil is concerned, each day of storage will entail a loss.

The writer further states that particular care should be used in making tank grades, as a tank built partly on filled ground and partly on excavated ground is liable to be disrupted at the point where the foundation goes from cut to fill. It is the best policy to fill the entire area to approximately the same depth so as to insure uniform settling. The "gas-tight" steel tank is admittedly the largest practicable type now in use in the different fields and specifications for such a tank of 55,000 barrel capacity of steel construction throughout are given in the bulletin. These specifications are very valuable in determining the proper construction for such a tank.

The writer points out that although the modern steel tanks in use today are capable of withstanding the pressure from within, proper attention is not paid to the wind stresses. It is very essential that, even though very few steel roofs have collapsed during a wind storm, precaution should be taken for overcoming wind stresses. The so-called "sand-line construction" is the most efficient for this purpose as the cost is reasonable and the method effective and easily applicable. Tank roofs, size of plates, swing pipes, swivel joints for swing pipes, explosion doors, and vacuum relief valves, are described in considerable detail.

Owing to the uncertainty of the market price of manufactured products, the future cost of tanks is difficult to ascertain. At the time of the outbreak of the war in August, 1914, a steel tank with steel roof could have been built for a cost of from 30 to 32 cents a barrel, but today such a tank would cost from 42 to 45 cents a barrel. Wooden roof tanks three years ago cost from 25 to 27 cents a barrel, but the same tanks are now worth 37 to 40 cents a barrel.

Concrete lined reservoirs are given considerable attention. The particular container described has an extreme outside diameter of 488 feet, a total depth of about 25 feet, and a slope on the sides of 1 to 1. In selecting the site for such a reservoir it is essential that the soil should be of homogeneous mixture, preferably a sandy clay, in which clay predominates. The

ie site should also be certain that the area ted

ving interesting facts are set forth

nsion joints are not necessary and have satisfactory

ure variations throughout the year in a voir filled with oil are surprisingly small

netrates the concrete lining to no appre-

of a reservoir varies from [illegible] to [illegible] cents

lin gives interesting data regarding the life of reservoirs and steel tanks the rage by seepage and evaporation with a advices used for lessening of evaporation water seal tops

this publication may be obtained by writ- ctor of the Bureau of Mines, Washington.

CURVE CHARTS

received from the Welsbach Illuminat l laboratories a number of prints [illegible] curve charts displaying tests of [illegible] types amps made by the Welsbach Company. also form a very interesting study [illegible] ned with different types of [illegible] be on file for reference in [illegible] gas [illegible] nating department

DUNNVILLE, ONT

DID gas development has resulted after ent drilling at Dunnville, Ont. by the ner Gas & Manufacturing Company Ltd. h has headquarters in the United States dy, N. Y.

well drilled by this company has [illegible] pressure per minute [illegible] reported [illegible] flow of about [illegible] cubic feet and this to be a corking good proposition but might be termed [illegible] Liberty We[illegible] [illegible] the [illegible] It is reported as pressure of [illegible] pounds with an open [illegible] feet. These figures are stated [illegible] [illegible] but are given with [illegible]

h the energetic and good work [illegible] e Diener [illegible] stated that [illegible] the [illegible] Dunnville Develop- [illegible] that [illegible] gas [illegible] August. The com- rn year [illegible] in Dunnville and there al [illegible] n the [illegible] the Company

It is quite natural that Mr Eugene [illegible] Diener who is President of the Company should feel quite elated over the success of the enterprise and his ability to [illegible] at his company in a way [illegible] eration to those interested

The results of the work done by the Diener Company should make [illegible] the people of Dunnville most excellent friends for Mr Diener and his [illegible] through whom the people of that place will have at their disposal one of the greatest gifts that nature has ever produced

EMPLOYMENT MANAGERS

Training Under Government Auspices

THE first course of intensive training in employment management under government supervision opened at the University of Rochester on Tuesday March [illegible] Twenty prospective employment managers sent by manufacturers having war contracts including especially shipbuilding plants and several departments at Washington began to take six weeks' intensive training in the practice and theory of employment management. Fifteen Rochester factories are [illegible] assisting the University of Rochester [illegible] theories [illegible] personnel management

The course [illegible] under the supervision [illegible] the several departments at Washington [illegible] the Emergency Fleet Corporation [illegible] Department the Quartermaster's Department the Department of Labor and the [illegible] has the endorsement of the [illegible] the General Staff [illegible] War Industries Board [illegible] the latter [illegible]

The establishment [illegible] later [illegible] Boston New York [illegible] man- agement [illegible] Fifteen [illegible] [illegible] management

1. [illegible]
2. Manufacturing [illegible] a gen- eral manager
3. Sales [illegible] manager

[illegible] these general [illegible] industrial enter- prise [illegible] added a [illegible] personnel [illegible] called in these [illegible] employment [illegible] man- agement [illegible] under [illegible] industry [illegible]

This new system [illegible] results [illegible] war

Giving to the Red Cross will help win the war

NEEDED!

Millions of Dollars

TO MAINTAIN

The Physical Strength of Our Army

AND

To Care for Injured and Ill

REMEMBER
OUR
MEN

RED CROSS WEEK

May 20th to 27th

BACK
THEIR
NEEDS

FOR THE GOOD OF THE SERVICE

EQUITABLE METER CO., PITTSBURGH, PA.

Dollars or Lives

The work of the Red Cross needs no introduction.

You know its service on the battlefields and in the devastated districts – the lives saved – the suffering aleviated.

This work needs funds to carry on – a small sum in comparison with the good accomplished.

The issue is squarely before every loyal American. Which do we hold most dear – our dollars or our soldiers' lives?

Your share? What can you afford? Then give double that amount today.

IN SERVICE

William Reigle
Ralph Dunn
Percy Thomas

DEDICATED BY

Warner Manufacturing Co., Beloit, Wis.

IN SERVICE

Frank Bertram
Frank Cook
Ralph Hendley

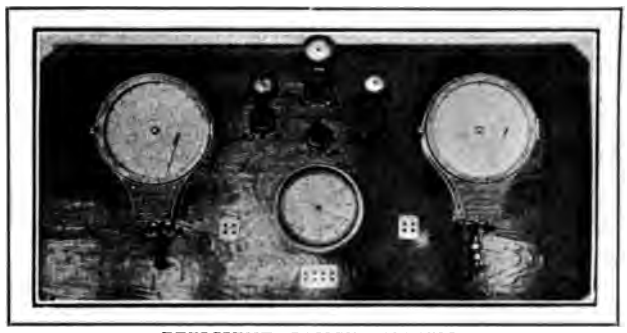
GOOD INSTALLATION OF PRESSURE GAUGES.

THE illustration that appears in connection with this article, displays the layout of a recording and signaling system, which is the outcome of experience and study on the part of Manager Woodward, of Santa Anna, Texas. Mr. Woodward states:

"When we were installing our system, and were ready for the pressure gauges, we wrote the manufacturers for gauges 'with electrical connections.' The gauges arrived with but one wired connection to ring one bell.

"It was necessary to have a signal for high pressure, and another signal for low pressure, and at first it seemed necessary to wire the equipment for two bells, but as a result of careful study of the situation, it was decided to ground one wire and thus make one bell ring for both high and low pressure.

"At the wells, steam regulators are used to reduce the rock pressure to desired given pressure, regardless of the variation of gas consumption.



EFFICIENT GAUGE SYSTEM.

"The gas is brought into the town at 140 pounds. The high pressure line enters the intermediate regulating station where the pressure is reduced to thirty pounds.

"In this intermediate regulating station is installed a pressure gauge like the large gauges shown in the illustration. Two wires are carried from this gauge into the office through a half-inch pipe. This wire installation was planned as a safety precaution, rather than to carry the *high pressure* into the office.

One of the two wires mentioned is connected with the top bell on the signal board, which rings if the pressure starts to crawl above a given pressure that has been determined upon. The other wire runs to the buzzer below the upper bell, which sounds in case the pressure drops below a determined pressure.

The gauge on the left connects with the intermediate regulating station and carries a pressure of thirty pounds. It is from this line that we supply all "industrials." The bell on the left rings if the pressure rises, or falls below the determined standard.

The round gauge in the center is simply a check on the intermediate gauge. The figures and hand on this gauge can be seen from any point in the office.

The gauge on the right is connected with the low pressure regulating station, where the pressure is reduced from thirty pounds (on the intermediate line) to four ounces. It is under this pressure that we deliver gas to our domestic consumers.

The recording and signaling system installation that is so neatly arranged upon a varnished board is installed in the company's office. Therefore, should anything go wrong with the city mains, or the low pressure station, announcement would be made in the office by the bell on the right, which is set to ring on three and six ounces. (This, of course, could be changed to any desired pressures).

The three push-button switches are ordinary electric circuit switches. The right switch button on the left switch is pushed to stop the ringing of the high pressure bell after it has signaled, and continues as a bell-cut-out until the line has been repaired.

To stop the ringing of the intermediate bell after alarm has been given, the left button on the left switch is pushed, while when the low pressure bell has signaled, the right button on the right switch is pushed to stop the ringing, which leaves the left button on the right switch, which ceases the ringing of the bell that indicates low pressure on the low pressure line.

As an auxiliary to this signal system, the board is connected with the telephone line whereby on Sundays and holidays, or at night, or during other periods when there is no one at the office, the buttons on the lower switch are pushed, this forms a connection with the telephone station, thereby if anything goes wrong with any portion of the system the central telephone station is automatically rung up, and the telephone operator having been informed where to find those of the office, by telephone, is enabled to at once communicate, whereupon a representative goes to the office, touches the proper buttons and promptly takes care of the condition in hand.

This equipment was installed about two years ago, and ample time has been thus given for the testing of the entire system, and in that period in no respect has the system failed to work to perfection.

Indeed, Mr. Woodward and his associates have reason to be proud of the system, which is of their own devising, and has performed its work in so excellent a manner.

HIRE YOURSELF

AS May 7th saw a notable mass meeting in New York City to commemorate the loss of the Lusitania, on which sank Mr. and Mrs. Elbert Hubbard, it would not be inappropriate in our commercial life to quote one of Mr. Hubbard's excellent sayings, entitled, "Hire yourself." It reads as follows:

HIRE YOURSELF!

The Law of Wages is as sure and exact in its working as the law of the Standard of Life. You can go to the very top. And going down the scale, you can find men who will not work of themselves and no one can make them work, and so their lives are worth nothing, and they are a tax and a burden on the community. Do your work so well that it will require no supervision, and by doing your own thinking you will save the expense of hiring someone to think for you.

—Elbert Hubbard.

Give to the Red Cross till selfishness says stop—then keep right on giving.

RESULTS OF DRILLING---LATEST REPORTS

PENNSYLVANIA FIELD.

BRADFORD FIELD.

Slingerland, McIntosh Oil	Dry
Bing, 580, A. P. Co. 217	Dry

MIDDLE FIELD.

Vail, Hopewell Oil & Gas 4	Dry
Vail, Nat. Oil 2	Dry
Schreiber, Cont. Oil 3	Gas
Wallace, Clinger Oil 4	Gas
Isenbaum, Proper & Co. 2	Gas
Lot 104, Perry Oil 1	Dry

Dry	3
Gas	3

VENANGO-CLARION.

C. & G., Crawford & Gregory 321	Gas
Clarion County—	
Booth, Henry Booth 3	Dry
Alleman, United Natural Gas 5	Dry
Jefferson County—	
Rogers, South Penn Oil M. D. 4	Dry

Dry	3
Gas	1

BUTLER-ARMSTRONG.

Levier, Stover & Co.	Gas
Smith, Johnson & Stanford	Dry
Moser, Phillips Gas 1	Gas
Cypher, American Natural Gas 1	Dry
Eichert, J. Eichert & Co. 3	Dry

Dry	3
Gas	2

SOUTHWEST PENNSYLVANIA.

Washington—	
Dunn hrs., Baker & MacBride 4	Gas
Alexander, Canonsburg S. & I. 1	Gas
Ingomar—	
Weber lot, Glenn & Co. 1	Dry
Duff County—	
Ihman, Harbison & Co. 1	Gas
Mt. Morris—	
Minor, Peoples Gas 1	Gas
Blair, Peoples Gas 1	Gas
Cole, Peoples Gas 1	Gas
Wendt, Carnegie Gas 1	Gas
Dye, South Penn Oil 4	Dry
Whipkey, Peoples Gas 1	Dry

Dry	3
Gas	7

WEST VIRGINIA.

Mannington—	
Trash, Hope Gas 1	Gas
Smith, Carnegie Gas 2	Dry
Kincaid, Blackshere Oil & Gas 1	Gas
Mason, Imperial Oil & Gas P. 2	Dry
Keyser, Pgh. & W. Va. G. 1	Dry
Riggs, Eastern Petroleum 8	Dry
Shuman, Hope Gas 5	Gas
Wetzel and Tyler—	
Teagarden, Manufacturers L. & H. 1	Gas
Snodgrass, Blackshere Oil & Gas 1	Gas
Roberts hrs., Hope Gas 2	Dry
Co. Poor Farm, Middlebourne O. & G. 7	Dry
Marshall County—	
Sorsey, Manufacturers L. & H. 1	Gas
Rhine, Manufacturers L. & H. 1	Gas
McGlumphey, Manufacturers L. & H. 1	Gas
Buzzard, Manufacturers L. & H. 1	Gas
Fair, Carnegie Gas 3	Gas
Brooke County—	
Ravora, Ravora & Co. 1	Dry
Ritchie County—	
Lambert, South Penn Oil 1	Dry
Keith, I. O. & G. P. 4	Dry
Smith, Carnegie Gas 2	Gas
Hogue, Carnegie Gas 1	Gas
Taylor, Carnegie Gas 21	Gas
Minnear, Philadelphia Co. 1	Dry
Wilson, Philadelphia Co. 21	Gas
Collins, Philadelphia Co. 2	Gas
Elder, I. O. & G. P. 1	Dry
Patton-Wilson, Ahrens & O'Dell 5	Dry
Wirt County—	
Johnson hrs., T. A. & E. P. Mellon 2	Dry
Barnes, Stayer Oil & Gas 6	Dry
Nutter-Wilson, Campbell Oil 3	Dry
Pleasants County—	
Riggs Bros., L. C. White & Co. 1	Dry
Ankrom, E. J. Edminds & Co. 1	Gas
Ferguson, Hope Gas 5	Dry
Calhoun County—	
Riddle, Hope Gas 1	Gas
Roane County—	
Queen, United Fuel Gas 2	Gas
Kanawha County—	
Sunday Creek Coal, United Fuel Gas 6	Gas
Bowers, K. V. P. 10	Gas
Thompkins, West Virginia Prod. 1	Dry
Knight, Eastern Carbon 1	Gas

Dry	18
Gas	21

SOUTHEASTERN OHIO.

Woodsfield—	
Ellis, Ellis & Cunningham 1	Dry
Thomas, J. L. Kaklan & Co. 1	Dry
Perry County—	
Rogers Bros., Ruth & Strong 15	Dry
Athens County—	
Grovner, George Washburn 6	Dry
Cunningham hrs., Wilmington O. & G. 10	Dry
Morgan County—	
Penrose, Mosier & Co. 3	Dry
Noble County—	
McAtee, S. W. King & Co. 9	Dry
Blake, A. L. Patton & Co. 2	Dry
Huffman, M. E. Roby & Co. 1	Dry
Miller, C. E. Hammonds & Co. 4	Dry
Marietta—	
Eddy, J. E Johnson & Co. 5	Dry
Becker, Patterson & Pevey 1	Dry
Farnsworth hrs. I. H. Kiggins & Co. 4	Dry
Wickens, J. T. Dillon & Co. 25	Dry
Decker, J. B. Braden O. & G. 9	Dry
Plumley hrs., Cambrina Oil 3	Dry
Carroll County—	
Madison, W. H. McClellan & Co. 3	Dry
Gordon, Scott Oil & Gas 1	Gas
Harrison County—	
Murer, J. B. Riffle & Co. 1	Dry

BRING THEM TO ME

Sketch Contributed by Frank Goodwin

We do not see these frightful scenes face to face, as does the Red Cross Nurse. Our Land is bright with freedom's Holy Light, our battles are being fought on foreign soil. The RED CROSS NEEDS MORE THAN "OUR BIT"—

OVER THERE

YOUR OPPORTUNITY IS COMING OVER HERE RED CROSS WEEK, MAY 20th to 27th

This Page Reminder is by Co-operation of **PITTSBURGH METER CO.,** EAST PITTSBURGH, PA.

DOLLARS FOR THE

Your Son, Your Employee, Your Employer, Your Neighbor
Yes, and in the
NAME OF HUMANITY

EVERY MOTHER'S SON

IN THE VAST ARMY

NEEDS THE RED CROSS

and the

Red Cross Needs

YOUR $ $ $

An Opportunity
to give, will be
Red Cross Week
May 20 - 27
Are You With
Us?

Jefferson County—
Mills, Ed. Housen 1 ..... Dry

Dry 20
Gas 1

PENNSYLVANIA FIELDS.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry.	Gas.
Allegany	9	4	0	0
Bradford	30	97	2	0
Middle Field	26	47	3	3
Venango-Clarion	33	41	3	1
Butler-Armstrong	13	14	3	2
S. W. Pennsylvania	23	113	3	7
West Virginia	100	783	16	21
S. E. Ohio	64	276	20	1
Total	298	1,385	50	35

CENTRAL OHIO.

LICKING COUNTY.

Licking—A. A. Haines, Werhle Stowe 2 ..... Gas

KNOX COUNTY.

Pike—A. J. Lorer, Upham Gas 2 ..... Gas

MEDINA COUNTY.

Harrisville—A. & S. Repp, Logan Gas & Fuel 1 .. Gas
E. M. Frary, Logan Gas & Fuel 1 ..... Gas
York—J. H. & H. Holcomb, Logan Gas & Fuel 1. Dry
H. Essig, Ohio Prod. & Refg. 2 ..... Dry
Lafayette—Rose Vlk, Ohio Fuel Sup. 1 ..... Dry
D. H. Weible, Medina G. & F. 2 ..... Dry

Dry 4
Gas 2

WAYNE COUNTY.

Chester—J. P. Seaman, Ohio Fuel Sup. 1 ..... Gas
Cannan—Fike-West, Ohio Fuel Supply 1 ..... Dry
Wayne—Jos. Winkler, Ohio Fuel Sup. 1 ..... Gas
Clinton—Elmira I. Craig, East Ohio Gas 2 ..... Gas
A. E. Aylesworth, Medina G. & F. 2 ..... Gas
Mira A. Eddy, Medina Gas & Fuel 1 ..... Gas
H. B. Williams, East Ohio Gas 1 ..... Dry
Green—V. C. Royer, Logan G. & F. 1 ..... Dry

Dry 3
Gas 5

CUYAHOGA COUNTY.

Dover—Allen Seager, Preston Oil 1 ..... Dry
H. Bailey, Preston Oil 1 ..... Gas
C. Durrow, East Ohio Gas 1 ..... Dry
R. Durrow, East Ohio Gas 1 ..... Gas
Schendel, East Ohio Gas 1 ..... Gas
Ezra Tuttle, East Ohio Gas 1 ..... Dry
C. Wilson, East Ohio Gas 1 ..... Gas

Dry 3
Gas 5

VINTON COUNTY.

Richland—C. R. Poling, Ohio Fuel S. 5 ..... Gas
H. W. Whitecraft, Ohio Fuel Sup. 1 ..... Gas
Reb. Blackstone, Ohio Fuel Sup. 2 ..... Gas
W. A. Sowers, Ohio Fuel Supply 1 ..... Dry
H. H. Cozad, Ohio Fuel Supply 1 ..... Gas
Harrison—J. E. Bechtel, Ohio Fuel Supply 2 ..... Gas
Jackson—H. J. Westcott, Ohio Fuel Supply 1 ..... Dry

Dry 2
Gas 5

PERRY COUNTY.

Thorn—M. Shaner, Heisey Gas 1 ..... Dry
M. Shaner, Heisey Gas 2 ..... Dry
J. Burkett, Heisey Gas 1 ..... Gas

Dry 2
Gas 1

HOCKING COUNTY.

Salt Creek—N. Karshner, Logan G. & F. 7 ..... Gas
W. H. McDowell, Ohio Fuel Supply 1 ..... Dry

Dry 1
Gas 1

CENTRAL OHIO FIELDS.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry.	Gas.
Licking	1	0	0	1
Fairfield	0	0	0	0
Knox	1	0	0	1
Ashland	0	0	0	0
Medina	7	5	4	2
Lorain	0	0	0	0
Wayne	9	125	3	5
Richland	0	0	0	0
Cuyahoga	8	0	3	5
Vinton	7	0	2	5
Perry	3	0	2	1
Hocking	2	0	1	1
Holmes	1	0	0	1
Coshocton	0	0	0	0
Jackson	1	0	1	0
Total	40	130	16	22

LIMA FIELD.

VAN WERT COUNTY.

Harrison—E. J. Springer, Arnold & Co. 1 ..... Dry

LIMA FIELD.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry.	Comp.	Prod.	Dry
Wood	0	135	0	1	5	0
Hancock	2	15	0	0	0	0
Allen	3	54	0	0	0	0
Auglaize	3	21	0	0	0	0
Sandusky	3	15	0	1	15	0
Mercer	3	30	0	0	0	0
Van Wert	3	12	1	0	0	0
Seneca	2	10	1	1	0	1
Ottawa	2	25	0	2	42	0
Total	30	317	2	6	2	1

INDIANA FIELD.

BLACKFORD COUNTY.

Harrison—T. C. Neal, National Steel Castin 5 .... Dry

JAY COUNTY.

Penn—D. J. Edmonson, Prairie Oil 5 ..... Dry

RANDOLPH COUNTY.

Monroe—B. F. Hill, W. H. Mitchell 2 ..... Dry

GIBSON COUNTY.

Patoka—C. T. Emerson, Farmers Oil 40 ..... Dry

PIKE COUNTY.

Madison—E. P. Barker, A. B. Bement 4 ..... Dry

If you can't go "over there" send your money "over the top" for you.

SULLIVAN COUNTY

[illegible] W F Beard H & S O & G 1 Dry
[illegible] McClure, Gambell & Hement 4 Dry
[illegible] Bragdon, Illinois Indiana Oil 6 Dry
A H Heeseman, F R Riggs 2 Dry
A H Bates, F R Riggs 2 Dry

Dry 6

INDIANA FIELD.

SUMMARY OF COMPLETED WORK

	Comp	Prod	Dry	Comp	Prod	Dry
[illegible]	1	0	1	0	0	0
[illegible]	1	[illegible]	1	1	0	1
[illegible]ware	4	145	0	0	0	0
[illegible]dolph	1	[illegible]	1	0	0	0
[illegible]	2	75	1	1	150	0
[illegible]	6	135	1	4	175	1
[illegible]son	8	14	6	4	6	1
Total	27	[illegible]	10	12	330	6

KENTUCKY-TENNESSEE

WOLFE COUNTY

[illegible] Sam Whisman Kentucky Pet Prod 2 Dry
[illegible] Brewer Caldwell & Fike 1 Dry
[illegible] Ky Jewell Oil 1 Dry
[illegible] Pat J White 1 Dry
[illegible] Whisman Huff & McCombs 1 Dry

Dry 6

LAWRENCE COUNTY

[illegible] J R Pigues [illegible] Dry
[illegible] Miller & White Dry

Dry

ESTILL COUNTY

[illegible] M Wagers [illegible] Dry

POWELL COUNTY

[illegible] M Nobles Pat J Wright Dry
[illegible] Wagers [illegible] Dry
[illegible] Wagers [illegible] Dry
[illegible] Wagers [illegible] Dry
[illegible] Watts [illegible] Dry
[illegible] Adams [illegible] Dry
W Wagers Carl K Dressel 1 Dry
[illegible] Mullins Carl K Dressel 1 Dry
[illegible] [illegible] K O A 1 Dry
[illegible] Harris Bundy & Hare 6 Dry
[illegible]ng Phipps & [illegible] Gas
[illegible] Sparks Petroleum Prod 1 Gas

Dry
Gas

LEE COUNTY

[illegible] W Olinger Kentucky Pet Prod 1 Gas
[illegible] Shoemaker Atlantic [illegible] Dry
[illegible] Stamper [illegible] Dry

Dry 1

ALLEN COUNTY

[illegible] Buchanan Chas Fisher 1 Dry
[illegible] Spencer Hague & [illegible] Dry
[illegible] Christian & [illegible] Dry
[illegible] Milligan Severn Gas 1 Dry

4

LAUREL COUNTY

[illegible] W Rheam White Gas & Oil 1 Dry

WARREN COUNTY

Bowling Green [illegible] Mississippi [illegible] & Investment 2 Dry

PULASKI COUNTY

Somerset Wright Mountain Oil 1 Gas

OWSLEY COUNTY

Meadow Creek Rose Meadow Creek Oil & Gas 2 Dry

GRAYSON COUNTY

Leitchfield Henson Kentucky Oil & R 2 Gas

TAYLOR COUNTY

Campbellsville [illegible] Van Dyke Midwest Power Oil 1 Dry

BULLITT COUNTY

Shepherdsville New Devonian Oil 1 Dry
Judge Gregory Devonian Oil 1 Dry
Dawson Devonian Oil 1 Dry
Samuels Devonian Oil 1 Dry
Meeker Devonian Oil 1 Dry
Maeden Devonian Oil 1 Dry

Dry 6

KENTUCKY-TENNESSEE

SUMMARY OF COMPLETED WORK

	Comp	Prod	Dry	Gas
Wayne	1	[illegible]	[illegible]	0
Wolfe	[illegible]	[illegible]	6	0
Lawrence	2	[illegible]	2	0
Morgan	1	6	[illegible]	0
Estill	20	288	1	0
Powell	64	[illegible]	10	2
Lee	24	417	1	0
Allen	[illegible]	[illegible]	4	0
[illegible]	[illegible]	[illegible]	[illegible]	0
[illegible]	[illegible]	[illegible]	[illegible]	0
[illegible]	[illegible]	[illegible]	[illegible]	0
[illegible]	[illegible]	[illegible]	[illegible]	0
[illegible]	[illegible]	[illegible]	[illegible]	1
Taylor	1	[illegible]	[illegible]	0
Bullitt	6	[illegible]	[illegible]	1
Total	[illegible]	[illegible]	16	[illegible]

ILLINOIS FIELD

CRAWFORD COUNTY

[illegible] W Davis [illegible] Dry
Marion [illegible] Central [illegible] Dry
Peoples Gas [illegible] Dry
[illegible] Mc[illegible] A Dry

Dry 4

LAWRENCE COUNTY

[illegible] [illegible] Dry

MARION COUNTY

[illegible] A Dry

WABASH COUNTY

[illegible] Dry
Bradford & McNay Mc[illegible] A Gas
W [illegible] Sons A [illegible] Gas

Dry

ILLINOIS FIELD

SUMMARY OF COMPLETED WORK

[illegible]

Clark 4
[illegible] [illegible] 4

Serve your country by helping the Red Cross army of mercy

The New Joan *of* Arc

Sketch Contributed by W. L. Starrett

This sketch portrays a reality that words fail to describe. It calls for YOUR RED CROSS AID the week of MAY 20th — 27th.

No Creed or Sect

All for Freedom and Humanity

An Abbe from the Front Said:

"I must tell you the story of a Jewish rabbi I knew who served at the Marne. Out on the bloody field a Catholic soldier was dying. In the mud a Catholic priest lay beside him, giving the last rites of the church. In the hands of the priest was the silver crucifix and to it the dying man yearned to press his lips. A shell exploded. It killed the priest. Under the bursting of shells the rabbi crawled forward; he picked up the crucifix; he put it into the hands of the dead priest and he pressed the symbol of Christ with the dead priest's hands to the lips of the dying man. This rabbi sacrificed his life that this Catholic soldier might die in his mother's faith."

RED CROSS WEEK
MAY 20th to 27th

These Pages Donated to this Just and Imperative Cause By

WELSBACH COMPANY, Gloucester, N. J.

Lawrence	4	170	1	0	0	0
Marion	1	0	1	0	0	0
Wabash	3	0	3	1	0	1
Jasper	1	2	0	0	0	0
Edgar	1	1	0	1	5	0
McDonough	1	10	0	0	0	0
Total	27	308	9	5	11	2

KANSAS.

BUTLER COUNTY.

2-28-4, Brant, Empire G. & F. 6 ..... Gas
34-25-5, Hayman, Seven Fields Oil 1 ..... Dry
23-26-4, Buscher, Dynamo Oil 1 ..... Dry
27-28-4, Martin, Gordon Heights Oil 1 ..... Gas
9-27-5, Marshall, Gold Dollar Oil 1 ..... Dry
4-27-5, Nuttle, Atlas Pet. 1 ..... Dry
27-24-5, Calvin, Norvall et al 1 ..... Dry
3-25-5, Robinson, Theta Oil 8 ..... Dry
15-26-4, Parker, Atlantic Petroleum 6 ..... Dry
33-25-4, Grey, Towanda Oil & Gas 1 ..... Dry
31-25-5, Adams, Sinclair Oil & Gas 69 ..... Dry
25-25-4, Allen, Fraizier et al 7 ..... Dry
1-25-5, Claasem, McMan Oil 1 ..... Dry
8-29-4, Rutherford, Mid Kansas O. & G. 6 ..... Gas
25-26-5, Sluss, Northeast Oil 1 ..... Dry

Dry 12
Gas 3

WILSON COUNTY.

28-[illegible]-16, Colaw, Anthony Gas 2 ..... Gas
5-28-16, Long, Sherman & Buck 1 ..... Dry
8-29-16, Watson, Farmers & Mechanics O. 2 ..... Gas
25-28-15, Farwell, Marion Oil & Gas ..... Gas

Dry 1
Gas 3
Gas 1,000 000

ALLEN COUNTY.

14-26-18, Schuman, K. M. & S. Oil 1 ..... Dry
16-26-18, Squires, T. M. Galey 2 ..... Dry
18-25-17, Stocklebrand, Eakin & Lamberton 3 ..... Dry

Dry 3

CHAUTAUQUA AND ELK COUNTIES.

26-33-11, Woodworth, Iowa Oil ..... Dry
29-31-13, Dixon, Bliss & Co. 3 ..... Gas
26-33-11, Gardner, Link Oil 19 ..... Dry
20-31-12, Dexter, Bliss & Co. 4 ..... Dry
2-31-12, McGuire, Duffield & Blair 5 ..... Dry
8-35-12, Fee, W. F. Lemon 3 ..... Dry
1-33-12, French, Geo. Perry 7 ..... Gas
2-35-10, Moore, Roth & Fainrot 3 ..... Gas
24-32-12, Morey, A. M. Clark 1 ..... Dry
31-31-13, Oliver, Appleton C. O. & G. 4 ..... Dry
26-33-11, Wodsworth, Iowa Oil 1 ..... Dry

Dry 8
Gas 3
Gas 4,500,000

NEOSHO COUNTY.

12-28-18, Rettig, Frank Devore et al 1 ..... Dry
19-27-18, Hammond, K. M. & S. Oil 1 ..... Dry
24-27-19, Johnson, Globe Oil 2 ..... Dry
14-28-20, Poor farm, Crown Oil 4 ..... Dry
19-28-18, City of Chanute 1 ..... Dry
27-27-16, O. Claw, Anthony Gas Snyd. 2 ..... Gas
20-28-18, Converse, Moore & Loy 1 ..... Dry
20-28-18, Brinkman, J. W. Leonard ..... Dry

Dry 6
Gas 1
Gas 500,000

MIAMI, FRANKLIN, DOUGLAS COUNTIES.

10-16-21, Whiteley, Flo Jean Oil 2 ..... Dry
18-14-22, Findley, Reid, Scarritt et al 1 ..... Dry
19-16-2, Wolf, Unnamed parties 6 ..... Dry
13-16-21, Lister, Wellington-Wellsville 4 ..... Gas
24-16-21, Pflug, Ruff, Vampell et al 2 ..... Dry
10-16-21, Whiteley, Flo Jean Oil 1 ..... Dry
S. of Rantoul, Lane, Unnamed owners 1 ..... Dry
6-17-22, Williams, Armourdale Oil & Gas 2 ..... Dry
21-17-22, Crees, I. N. Miller 3 ..... Dry
14-16-21, Cone, Wilson & McCullough 2 ..... Dry
20-16-21, Moherman, Sentinel O. & G. 3 ..... Dry
19-16-21, Fee, F. E. Wolfe 1 ..... Dry
14-16-21, Winegard, Russell, Strand et al 1 ..... Dry
24-16-21, Pflug, Ainsworth et al 2 ..... Dry
27-16-20, Easdale, Walnut Creek O. & G. 1 ..... Dry
20-16-21, Moherman, Otto Shazt O. & G. 2 ..... Dry
33-14-21, Rodewald, Kansas Natl. Gas 3 ..... Gas
32-16-21, Tulloss, Benton Oil & Gas 3 ..... Gas
23-16-21, Booze, George Staves 2 ..... Dry
12-16-20, Mallory, Mallory et al 2 ..... Dry
16-16-21, Cone, Neiswener & Brendell 1 ..... Dry
35-16-21, Long, Unnamed persons 1 ..... Dry
32-16-21, Tullos, Benton Oil & Gas 4 ..... Dry

Dry 20
Gas 3
Gas 1,000,000

MONTGOMERY COUNTY.

10-33-14, Tucker, Franklin Oil 1 ..... Dry
23-34-15, Ellison, National Refg. 1, 2 ..... Dry
14-35-14, Louthan, McNabb & Barrington 1 ..... Dry
31-34-15, Dabney, Wyoming Blackford O. 1 ..... Dry
35-35-15, Torpedo, Coon et al 3 ..... Gas
10-35-15, Barnes, Graham, Knight et al 1 ..... Dry
33-35-15, Scovell, Mahutska & Samuel 1 ..... Dry
30-34-16, Day, Jesse Graham 22 ..... Gas
3-33-15, Edman, C. E. Roth 3 ..... Gas
28-32-16, Lange, Stoop et al 2 ..... Dry
18-33-15, Erhardt, J. F. Overfield 8 ..... Dry
35-29-15, Montgomery, Sticelber & Banowitz 1 ..... Dry
3-33-14, Jones, Tulsa parties 1 ..... Gas
6-35-15, Sonora Petroleum 2 ..... Dry
2-33-14, M. Fee, Minnesota Oil 1 ..... Dry
6-35-15, Bual, Mont. Co. State Bank 4 ..... Dry
18-33-15, Bolt, Stoll et al 1 ..... Dry
13-32-14, Inscho, Home Producers 2 ..... Gas
4-32-16, Turner, Independence O. & G. 1 ..... Dry

Dry 14
Gas 4
Gas 1,000,000

WILDCATS.

Sowley County—
6-31-4, Clark, Little Pirate Oil 3 ..... Dry
Ellsworth County—
1-16-10, W., Dunrave, Carter Oil 1 ..... Dry
Woodson County—
35-26-13, Ireland, Gaston & Daniels 1 ..... Dry
22-25-15, Harder, Orona Oil & Gaas 3 ..... Dry
Elk County—
12-30-12, Lewis, Peerless Oil 1 ..... Dry
Marion County—
31-21-4, Townsend, Crawford et al 1 ..... Dry
Greenwood County—
2-26-10, Armstrong, Parker et al 1 ..... Dry
Webaunsee County—
12-10-10, Miller, Crawford & Jennings 1 ..... Dry
Greenwood County—
11-24-11, Piet, Henckemper et al 1 ..... Dry

Dry 9

Help to conserve our manpower by supporting the Red Cross.

OKLAHOMA.

NOWATA AND NORTHERN ROGERS COUNTIES

Williams, Armourville O. & G. Dry
Brown Muskola O. & G. Dry
Dann Cleve Oil Dry
Romney, et Southwestern Oil Dry
Shaff Cabin Valley Mining Dry
Martin Belmont Pet. Dry
Baker H. C. Campbell Dry
Hill, Unusual Oil Dry

Dry

OSAGE COUNTY

Gas
Osage & Ohio Gas Gas
Charles Page Dry
Standish Oil Gas
Gas
Oklahoma O. & G. Dry
Osage Hominy Oil Gas
Talmoa Oil Dry
Oklahoma O. & G. Dry
Indian Ter. Illuminating Oil Gas
Imperial Osage Development Dry
Ind. Ter. Ill. Oil Gas
Frank Tack Dry
Dry
Collegeque Gas
Romance Oil Dry
Dry

WASHINGTON COUNTY

TULSA COUNTY

OKMULGEE COUNTY

Hamilton Sec.
Dry
Adams & W. Kemble Dry
Dry
Dry
Mounds
Gas
Ohio Oklahoma Nat. Gas Gas
Gas
Gas
Gas
Gas
Dry
Okmulgee and Morris
Dry
Dry
Scott Okmulgee L. & R. Gas
Walker D. Parker et al. Dry
Dry
Gas
Johnson Okmulgee L. & R. Gas
Hennessey
Gas
Gas
Gas
Gas

WASHITA MUSKOGEE DISTRICT

Stand back of the Red Cross

"Unto the Least of These"

Sketch Contributed by Arthur William Brown

MAKE A PERSONAL APPLICATION OF THIS SKETCH --- WERE THESE YOURS?

YOU'D HOPE THAT THE WORLD WOULD

GIVE ! !

Do by others as You would be done by.

THE RED CROSS IS OUR AGENT

Every dollar expended is audited by our War Department — It's a safe, sure means of relief.

CO-OPERATING WITH THE RED CROSS
THIS PAGE IS CONTRIBUTED BY

METRIC METAL WORKS - - ERIE, PA.

Out of the Trenches for a Breathing Space

Sketch Contributed by James Montgomery Flagg

READ THIS:

"Just now the trenches are in a frightful condition of mud and water, and it is utterly impossible for the men to keep dry or to have dry dug-outs to sleep in. They are in a state of misery, as far as physical comfort goes, for days at a time; and yet they stand all night, often for 16 hours at a stretch, in pouring rain and under intermittent fire, looking out over the parapet into the darkness of No Man's Land, guarding humanity; and if you walk along and ask them how they are getting on, the answer will be a cheery, "Everything fine, Sir".
—ATLANTIC REVIEW

When the men come back from gas, fire, shelling and "no man's land", it's the Red Cross they all look to for aid. Now IT'S UP TO US at home to support the Red Cross to the limit and then some. Will you do your utmost with dollars Red Cross Week, May 20th to 27th ?

THIS PAGE IS DEDICATED WITH A WISH TO HELP.

WORTHINGTON PUMP AND MACHINERY CORPORATION, 115 Broadway, New York City
SNOW STEAM PUMP. Div.

29-18-15, McHenry, F. D. Misener 4..... Gas
14-18-16, Cunningham, Gladys Belle Oil 1..... Dry
Catoosa—
10-20-14, Slater, Tulsa Fuel..... Dry
Muskogee—
36-15-18, McKellapp, F. E. Coss 1..... Dry
Haskell and Stone Bluff—
16-15-16, McIntosh, Mid-Continent Dev. 3..... Dry
16-15-16, McIntosh, Peterson et al 3..... Gas
17-15-16, Banks, Davis et al 5..... Dry
1-16-15, Rothammer, Cosden Oil & Gas 1..... Dry
30-16-15, Lowery, Kistler et al..... Dry
28-15-16, Harrison, Cunningham & Beam 1..... Gas
29-16-15, Kilby, Presto Oil & Gas 2..... Gas
20-15-16, Woodall, Curd & White 2..... Dry
17-15-16, Banks, Peterson et al 5..... Dry
16-15-16, McIntosh, Mid-Co. Dev. 4..... Dry
21-16-15, Asbury, Melba Oil 1..... Gas
28-16-15, Roe, Anco Oil ..... Dry
35-5-15, Manuel, Brown et al 4..... Dry
Boynton and Cole Pool—
8-14-16, Brown, New York Oil 5..... Dry
18-14-15, Patterson, Patterson O. & G. 5..... Dry
35-15-15, Manuel, Cosden & Acme Oil 3..... Dry
15-13-15, McGilbra, Terriokla Oil 1..... Dry
22-13-15, Grayson, Tri-State Oil 1..... Dry
8-14-16, Brown, Henry Oil 5..... Dry
15-13-15, Sandy, Fifty-Five Oil 2..... Dry
15-13-15, McGilbra, Owensby et al 1..... Dry
3-14-15, McGilbra, Minnetoka Oil 4..... Dry
6-14-15, Rentie, Cosden Oil & Gas 1..... Dry
Muskogee—
18-14-18, Hayes, Pittman et al 3..... Dry
10-14-18, Barnett, Bradstreet et al 1..... Dry

Dry 28
Gas 6
Gas 35,000,000

CREEK COUNTY.

Cushing District—
4-18-8, Monday, Cushing Development 1..... Dry
14-18-7, Corbray, P. O. & G. 3..... Dry
20-18-7, Wacoche, Sinclair Oil & Gas 6..... Gas
9-18-7, Freeman, Producers Oil & Gas 14..... Dry
10-18-7, Nettie, Texas Co. 5..... Dry
3-16-7, Hemmitt, P. O. & G. 5..... Dry
1-17-7, Fixico, Monitor Oil & Gas 3..... Gas
30-17-7, Benson, Cushing Development 2..... Dry
11-18-7, Smith, Iron Mountain Oil 5..... Dry
14-18-7, Selvina, Magnolia Petroleum 6..... Dry
21-17-7, Watson, P. O. & G. 37..... Gas
Mannford—
15-18-10, Stanley, Marshall et al 2..... Dry
22-18-10, Biggy, Sapulpa Refg. 2..... Dry
35-18-10, Jackson, Kelley et al 6..... Dry
Tuskegee—
15-15-10, Clinton, Hawthorne Oil 8..... Dry
23-15-10, Barnett, Sperry Oil & Gas 1..... Dry
3-15- 9, Simmons, Iron Mountain Oil 1..... Gas
Glenn Pool—
27-18-11, Bruner, Mrs. Northrup 5..... Gas
34-18-11, Spocogee, H. U. Bartlett 1..... Gas
9-18-12, Fulton, Mt. Vernon Oil 9..... Dry
18-17-12, Bosen, Okla State Oil 33..... Gas
33-18-12, Brown, P. O. & G. 7..... Dry
6-17-12, Childers, P. O. & G. 11..... Gas
7-17-12, Pittman, Texas Co. 1..... Gas
6-17-12, Gypsy Oil ..... Gas
3-18-11, Tahledge , Laurel Oil & Gas 2..... Dry
27-18-11, Bruner, Ingalls et al 5..... Gas
6-18-12, James, Graves et al 9..... Gas
25-17-11, Green, Federated Oil & Gas 1..... Gas
33-17-11, H. George, Cinco Oil 17..... Dry
27-18-11, Ingalls, Mathews et al 2..... Gas
35-18-12, Watson, ribes Oil 1..... Dry
33-17-11, Robinson, Graham et al 2..... Dry

Kellyville—
22-16-10, Miller, Atlantic Pet. 1..... Dry

Dry 19
Gas 43,000,000
Gas 14

PAWNEE COUNTY.

Cleveland District—
2-21-9, Charles Page 1..... Dry
8-20-8, Liscomb, Selby Oil & Gas 4..... Dry
1-20-7, Mullendore, Selby Oil & Gas 2..... Dry

Dry 3

PAYNE COUNTY.

Yale Pool—
35-19-5, Lee, Roma Oil 2..... Gas
25-19-5, Lee, Roma Oil 1..... Gas
5-18-5, Taylor, Okla. Nat. Gas 1..... Dry
26-18-5, McCorkell, C. B. Shaffer 2..... Gas

Dry 1
Gas 3
Gas 20,020,000

GARFIELD AND NOBLE COUNTIES.

Garber—
15-22-4, Searcy, Algiers Oil 1..... Dry

KAY COUNTY.

Blackwell District—
4-28-1, Booten, Carter Oil 1..... Dry
29-29-1, Presbury, Empire G. & F. 2..... Gas
31-29-1, Pratt, Empire G. & F. 4..... Gas
6-28-1, Wolfe, Blackwell O. & G. 10..... Gas
1-28-1W, Hampton, Mid-Co. Pet. 1..... Dry
13-26-2W, Wainscoat, Kay & Kiowa 1..... Dry
31-29-1, Shurtz, Empire G. & F. 1..... Gas
35-28-1W, McIntyre, Northcliffe Devel. 1..... Dry

Dry 4
Gas 4
Gas 40,000,000

CARTER COUNTY.

Healdton District—
6-3-2, Kirk & Patsy Oil 2..... Gas
26-5-2, Sullivan, Burford et al 1..... Dry
33-3-3, Sarasota, Harris & Strawn 15..... Dry
31-2-2, Bennett, Evan Bates 2..... Gas

Dry 2
Gas 2,000,000

WILDCATS.

Pontotoc County—
34-15-7, G. Fagan, Oil State Pet. 1..... Dry
McIntosh County—
1-10N-16E, Carr, R. H. Scarcy 1..... Dry
Garfield County—
20-24N-7W, Hartman, McCready and others 1..... Dry
Woods County—
2-28N-17W, Adamson, Northwestern Oil 1..... Dry
Garfield County—
31-24N-3W, Botts, Enid Co-op. Oil 1..... Dry
Alfalfa County—
31-24N-3W, George, Mendes et al 1..... Dry
Roger Mills County—
17-27N-21W, Bu. Co. Oil 1..... Dry
Payne County—
27-19-4, Miller, Fortuna Oil 1..... Gas
Kay County—
11-27-1W, Bucholtz, Duluth-Okla Oil 2..... Dry
LeFlore County—
23-7N-26E, Durant, American Indian Oil 1..... Gas
27-7N-26E, Hill, American Indian Oil 1..... Gas
Garvin County—
10-4N-3E, Strickland, Barnsdall Oil 1..... Dry

You are fighting the enemy if you are giving to the Red Cross.

Atoka County—
26-1N-14E, Miller, Bison Oil 1 ..... Dry
Pushmataha County—
8IS-14E, Crawford, Indiana-Okla Oil 2 ..... Dry
Stephens County—
11-2N-5W, Smith et al 1 ..... Gas
Wagoner County—
31-12-16, Scott, Barbara Oil 1 ..... Dry
17-17-17, Joe Childers, Rainey et al 1 ..... Dry
Muskogee County—
30-14-19, Morris, Bud Ledbetter et al 1 ..... Dry
Jefferson County—
3-7S-6W, Trout, I. & N. 1 ..... Dry
Carter County—
26-5-2, Burford & Brim O. & G. 1 ..... Dry

Dry 16
Gas 4
Gas 77,000,000

ARKANSAS.

Drew County—
13-13-5, Jamison, Sulphur Rock Dev. 1 ..... Dry

KANSAS.

SUMMARY OF WELLS COMPLETED.

	Comp.	Prod.	Dry.	Gas
Butler	107	59,110	12	3
Chautauqua-Elk	53	1,235	9	3
Montgomery	40	334	14	5
Wilson	17	167	1	3
Neosho	37	562	8	1
Allen	21	326	3	0
Miami-Franklin-Douglas	60	534	19	3
Wildcats	16	480	9	0
Total	352	62,748	75	18

OKLAHOMA.

SUMMARY OF WELLS COMPLETED.

	Comp.	Prod.	Dry.	Gas
Osage	115	4,868	10	7
Washington	57	668	6	3
Nowata-Rogers	77	807	8	0
Tulsa	65	1,707	21	6
Creek	57	1,512	19	14
Okmulgee	143	12,836	33	8
Muskogee-Wagoner-Rogers	74	4,795	28	6
Payne	13	950	1	3
Kay	26	3,905	4	4
Garfield-Noble	12	3,560	1	0
Carter	21	605	3	2
Wildcats	32	450	16	4
Total	709	37,168	153	57

MID-CONTINENT.

SUMMARY OF WELLS COMPLETED.

	Comp.	Prod.	Dry.	Gas
Kansas	352	62,748	75	18
Oklahoma	709	37,168	153	57
Arkansas	4	0	4	0
Total	1,065	99,916	233	75

WYOMING.

18-48-90, Tensleep, Ohio Oil 1 ..... Gas
6-33-79, Placer claim, General Pet. ..... Dry
19-40-79, Placer claim ..... Dry
61-40-79, Placer claim, 1 and 2 ..... Dry
24-40-80, Placer claim ..... Dry
25-40-80, Placer claim ..... Dry
25-40-80, Placer claim, Bessemer Oil 1 ..... Dry
23-33-76, State land, William Cheley 1 ..... Dry
16-41-81, Western Expl. Co. Shiloh Oil 1 ..... Dry

Dry 9
Gas 1
Gas production 10,000,000

COLORADO.

Akron, Akron Oil ..... Dry
Aurora, Mid-West Colorado ..... Dry
Padroni, Sterling Oil ..... Dry

Dry 3

WYOMING-COLORADO.

GENERAL SUMMARY.

	Comp.	Prod.	Dry.	Gas
Wyoming	17	1,100	9	1
Colorado	3	0	3	0
Total	20	1,100	12	1

TEXAS PANHANDLE.

ELECTRA.

Ziest, D. A. Smith et al 1 ..... Dry
McAllister et al 1 ..... Dry

Dry 2

SUNSHINE HILL.

McClure, Brewer et al 3 ..... Dry
McClure, Briner et al 3 ..... Dry

Dry 2

BURKBURNETT.

Buerbaum, Magnolia Petroleum 2 ..... Dry
Morris, Johnson et al 1 ..... Dry

Dry 2

BURKBURNETT.

Hardin, Mann et al 34 ..... Dry
Rexford, Bishop et al 1 ..... Dry
Williard, Williard Oil 1 ..... Dry

Dry 3

CULBERTSON.

Burnett, Gulf Production 6 ..... Dry
Wilson, Gulf Production 1 ..... Dry
Wilson, Gulf Protection 3 ..... Dry
Jennings, Gulf Production 1 ..... Dry

Dry 4

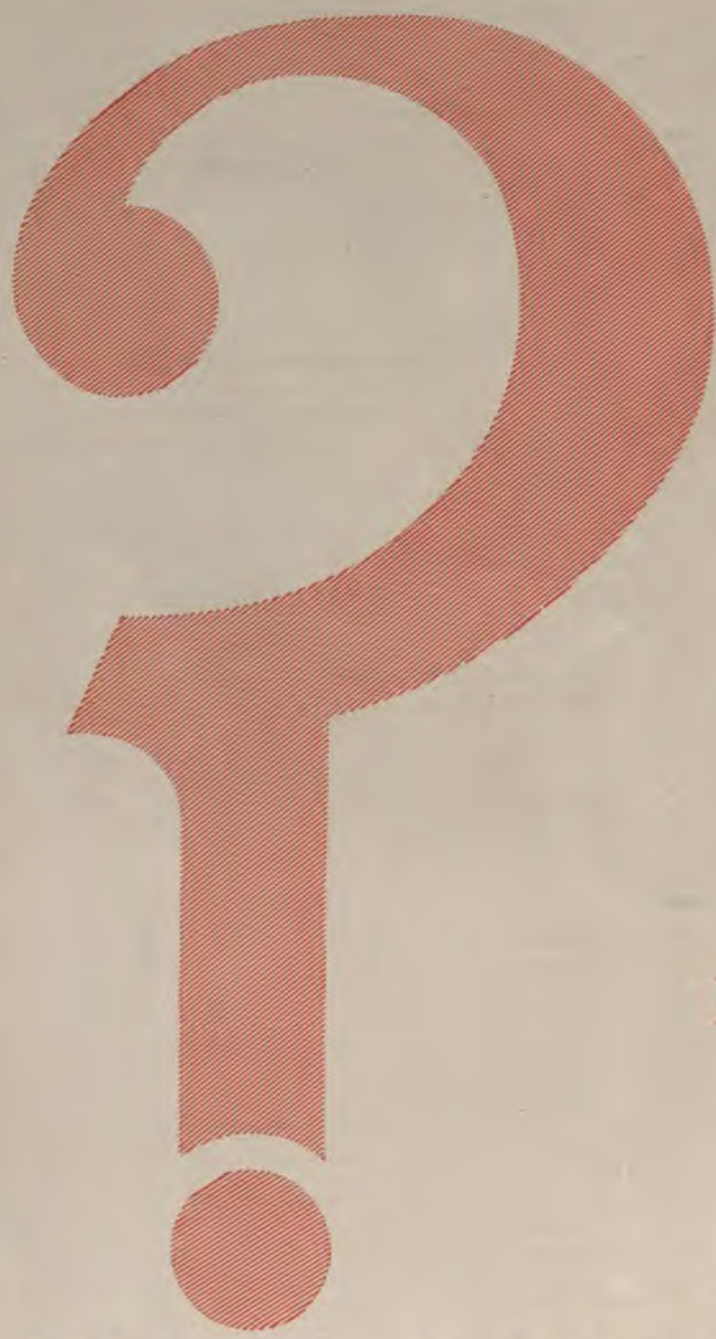
BROWNWOOD.

K-O-Tex Oil 1 ..... Dry
K-O-Tex Oil 2 ..... Dry

Dry 2

WILDCATS.

Wichita County—
Near Burkburnett, Atkins Oil 2 ..... Dry
Shakleford County—
Snyder, Empire Gas & Fuel 1 ..... Dry
Palo Pinto County—
Stuart, exas & Pacific Coal 4 ..... Dry
Foard County—
Haylatty, Texas Co. 1 ..... Dry
Brown County—
Waller, Magee et al 1 ..... Gas
Stephens County—
Ragney, Texas & Pacific Coal 1 ..... Gas



WILL YOU?

THAT'S THE QUESTION

WEEK

MAY 20th - 27th

Help to relieve the pain and suffering of

OUR MEN

at the front and in the camps.

OVER 3,000,000 MEN

must be protected against needless amputations in the loss of limbs and arms. Also loss of health and nerves.

THE RED CROSS

is a great means to this end, but every individual (YOU) must be a Red Cross Backer.

THIS PAGE IS THE GIFT OF

THE GRAVES SUPPLY COMPANY, - Cincinnati, Ohio

"They come to me — I come to you." ✚

Sketch contributed by Frank Godwin

"MEN OF THE GAS INDUSTRY OF THE UNITED STATES WILL YOU HELP US TO HELP THESE?"

EVERY CENT
EVERY DOLLAR
possible, is
NEEDED FOR
HUMANITY

TO MAKE THE
WORLD WORTH
LIVING IN.
TO SAVE LIVES
TO MAKE WHOLE.

AN OPPORTUNITY TO GIVE IS YOURS RED CROSS WEEK, MAY 20-27

THIS PAGE IS CONTRIBUTED BY

BESSEMER GAS ENGINE CO., Grove City, Pa.

Sudderath, Texas & Pacific Coal 1	Dry
Raney, Texas & Pacific Coal 1	Gas
Linney, Texas & Pacific Coal 6	Gas
Linney, Texas & Pacific Coal 7	Gas
Dry	5
Gas	5

NORTH LOUISIANA.

Caddo—	
28-21-15, Heilperin, The Texas Co. 2	Gas
27-21-15, Solly, Rowe Oil 2	Dry
25-21-15, Noel, Old Farmers Oil 1	Gas
Red River—	
27-13-11, La-Delta Pecan Texola Oil 1	Gas
Miscellaneous—	
..-17-23, Williams, Ark. Natural Gas 63	Gas
25-17-14, Cronk & Herbert, Atlas Oil 1	Dry
2-11-16, Bland, The Texas Co. 1	Dry
18-15-12, Huron Land, The Texas Co. 2	Dry
3-21- 1, Pearson, Lock & Brown 1	Dry
22-12- 8, Wren, Vogeler Oil 2	Dry
12-10- 6, West, Ahrens et al 1	Dry
30- 6-12, Long Leaf Lumber Co., Pomeroy & Hamilton 1	Dry
Bowie County, Texas—	
Morse, Sulphur River Oil 1	Dry
Dry	9
Gas wells	4

NORTH LOUISIANA.

SUMMARY OF MARCH OPERATIONS.

	Comp.	Prod.	Dry.	Gas
Caddo	24	14,500	1	2
De Soto	4	250	0	0
Red River	3	65	0	1
Bossier	0	0	0	0
Miscellaneous	0	0	0	1
Total	40	14,815	10	4

GULF COAST.

GOOSE CREEK.

Rosenthal, Gulf Production 2	Dry
Schilling, Simme-Sinclair 20	Gas
Gas	1
Dry	1

JENNINGS.

Chicago-Jennings, Gulf Refg. 5 (old)	Dry

MARKHAM.

Myers, Clem Oil 13	Dry

MISCELLANEOUS.

Harris County—	
Seabrook, Taylor Oil & Gas 2	Dry

SOUTH LOUISIANA.

Calcasieu Parish—	
Fee, Standard Sulphur Co. 1	Dry
Allen Parish—	
Lyles, Barnes Creek Oil 5	Dry
Dry	2

GULF COAST.

SUMMARY OF OPERATIONS.

	Comp	Prod	Dry.
Anse La Bute	0	0	0
Batson	4	135	0
Damon Mound	13	435	8
Edgerly	1	125	0
Goose Creek	32	35,215	7
Humble	29	5,990	9
Jennings	2	150	1
Markham	3	0	3
Spindletop	8	560	1
Saratoga	4	3,035	1
Sour Lake	13	615	5
Vinton	6	2,100	1
New Iberia	1	75	0
Piedras Pintas	3	10	1
Miscellaneous	15	0	15
Total	134	48,445	52

TEXAS-LOUISIANA.

SUMMARY OF OPERATIONS.

	Comp.	Prod.	Drv.	Gas
North Texas	148	8,775	18	5
North Louisiana	40	14,815	50	4
Gulf Coast	134	48,445	52	1
Total	322	72,025	120	10

CANADA'S TAXATION

PROBABLY all of our readers, or most of them, have seen the announcement in the daily press, that Canada is to pay bigger taxes to pay war expense. Let us hope that voluntary giving of money to the government of the United States may prevent intensive taxation overhere.

When taxes are assessed and collected, there is of course no rate of interest payable to compensate the one taxed. Nor is there any guarantee of a repayment of these funds, whereas with the Liberty Loans, like the three that have thus far been harvested, *the "tax" idea is eliminated*, the government promising to refund in full, all moneys advanced by its peoples *with interest*.

When the next Liberty Loan comes along, individuals (the masses) should remember that a tremendous proportion of the regular and even special taxes levied every year by the government fall upon big manufacturing corporations and men of vast incomes and wealth; therefore, the repaying of Liberty Loans by the government will not fall as a heavy burden upon the individual smaller bond holder. He will be repaid by the government out of funds acquired by the government through taxes on incomes, returns from exports and through many channels. The repayment to him with interest, as we have said, will not be accomplished by heavy taxes levied upon him personally.

How much better to *loan* our money to the government at interest, than to have the experience of tremendously heavy taxes, non-repayable by the government and non-interest bearing.

Watch out for the next Liberty Loan, when it is asked, and take advantage of Uncle Sam's liberal policy of borrowing *returnable* money at good interest to the loaner.

Make sure that our wounded are cared for by giving to the Red Cross.

AROUND THE BELT

New Wells, New Pipe Lines, New Contracts, Additions and Extensions. A Fund of Valuable News Gathered for the Journal Through Many Sources.

TRADE PERSONALS

It will be noted that the names appearing under the personal headings are exclusively those of men interested in the development of the natural gas field. Those wishing to learn of matters pertaining to men interested in the field of artificial gas should refer to THE GAS INDUSTRY magazine, published at 60 Pearl Street, Buffalo, N. Y., which devotes its columns entirely to artificial gas matters. That magazine is published by the publishers of THE NATURAL GAS JOURNAL, each magazine being specificially issued for its respective field. In this way each magazine renders 100% efficiency in the industry it covers.—Publisher's Note.

BONNER, JAMES A., has retired after serving thirty years as Superintendent of drilling operations for the the Phillips Gas & Oil Company, Butler, Pa.

MORRISON, R. E., representing the Empire Gas & Fuel Company at Kansas City, Mo., has been elected Chairman of the Information Committee of the International Convention of Rotary Clubs which will take place in that city next month.

OWENS. J. E., Vice-President and General Manager of the Oklahoma Gas & Electric Company. Oklahoma City, Okla., was chosen President of the Oklahoma Gas, Electric & Street Railway Association at its annual meeting recently held.

SULLIVAN, L. A., Superintendent of the Muskogee Gas & Electric Company, Muskogee, Okla., presented an excellent paper on "Gas Fired Boilers" before the convention of the Oklahoma Gas, Electric & Street Railway Association.

WILLIAMS, GEORGE, has been elected Director of the Cities Service Company. Mr. Williams succeeds Mr. John C. Mitchell of Denver, who recently resigned on account of pressure of other matters.

ELECTED

OHIO—Cincinnati

At the annual meeting of the Union Gas & Electric Company, the following directors were re-elected: Chas. Boldt, W. Y. Cartwright, George W. Crawford, W. W. Freeman, P. G. Gossler, Lewis J. Hauck, August Herrmann, J. M. Hutton, A. B. Leach, Lawrence Maxwell, Polk Laffoon. T. F. Wickham, and Chas. P. Taft, Robert A. Taft and Samuel Assur retired from the board and R. C. Altizer of Charlestown, W. Va., was elected to fill one of the vacancies.

TEXAS—Fort Worth

At the recent annual meeting of the Lone Star Gas Company, the following officers were elected: President, L. B. Denning, 8 East Long St., Columbus, O.; First Vice-President, and General Manager, F. M. Lege, Jr., Fort Worth, Texas; Second Vice-President, M. W. Bahan, Fort Worth, Texas; Secretary and Treasurer, D. L. Cobb, Fort Worth, Texas; Assistant Secretary and Treasurer, H. A. Jackson, Fort Worth, Texas; Assistant Secretary and Treasurer, R. W. Sterritt, Fort Worth, Texas; Manager Natural Gas Department. F. L. Chase, Fort Worth, Texas; Manager Oil Department, W. P. Gage, Fort Worth, Texas.

PER CUBIC FOOT—RATES

CALIFORNIA—Glendale.

The Southern California Gas Company in offering to establish natural gas service in this city, has prepared the following tentative rate schedule: First 5,000 cu. ft., per 1,000, 80 cents; next 5,000, 75 cents; next 15,000, 65 cents; next 25,000, 55 cents; next 50,000 45 cents; all over 100,000 cu. ft. a month, per 1,000 cu. ft., 40 cents.

OHIO—Delphos

The Delphos Gas Company has adopted a readiness-to-serve charge of 50 cents per month which will remain in force until eighteen months after the termination of the war.

PENNSYIVANIA—Beaver Falls

The Manufacturers Light & Heat Company has filed a new schedule of rates with the Public Service Commission at Harrisburg, in which it is asking for an increase of rates amounting to 5 cents per 1,000 cubic feet. The present rate is 32 cents per thousand.

Harrisburg

The American Natural Gas Company and the Gilpin Natural Gas Company, operating in Allegheny, Armstrong, Butler, Indiana and Westmoreland Counties, have filed notice of increase of rates, effective May 19, with the Public Service Commission.

The new tariff provides for an advance from 25 to 28 cents a thousand cubic feet for all gas used in excess of 500,000 feet a month by manufacturers and other large users.

Kane

The Kane Gas Light & Heating Company, operating in the Borough of Kane, has filed with the Public Service Commission a new tariff of rates for the sale of natural gas, effective May 31, 1918, increasing the rate for gas to manufacturers and to public service corporations from 22 cents per thousand cubic feet, less 2 cents per thousand cubic feet for prompt payment, to 27 cents per thousand cubic feet.

The new tariff further provides that the company reserves the right to curtail or temporarily discontinue the supply of gas to manufacturing establishments,

THE SUN THAT NEVER SETS

Sketch Contributed by H. Davitt Welsh

"Mother, this was our home, but see, the Red Cross, *a sign of promise*, in the sky. It will help us to start life over again."

FILL THE COFFERS OF THE RED CROSS

No sum too small for the infant to give — no sum too large for the parent to subscribe.
Every expenditure is audited by the war department. The funds are wisely spent — GIVE LIBERALLY.

RED CROSS WEEK — MAY 20TH TO 27TH

THIS PAGE IS OFFERED TO THE CAUSE BY **EDWIN H. FITLER CO., Philadelphia, Pa.**

when necessary to provide sufficient gas for domestic consumption or for public utilities.

New Castle

An application for an increase in rates for gas supplied in this city, has been filed with the Public Service Commission at Harrisburg, by the Manufacturers' Light & Heat Company. The increase asked is 5 cents per thousand cubic feet. The rate now prevailing is 32 cents, the new rate asked is 37 cents. The rate will become effective on June 1, according to the petition of the company.

ITEMS OF FINANCE

KANSAS—Topeka

A recent report of the Prairie Oil & Gas Company and the Prairie Pipe Line Company shows resources of over $152,000,000. The Prairie Pipe Line Company shows assets exceeding $50,000.000, and the Prairie Oil & Gas Company $102,000,000.

KENTUCKY—Louisville

The Louisville Gas & Electric Company reports for March gross earnings of $269,287, an increase over March, 1917, of $27,095; net earnings $140,952, an increase of $10,033. For the twelve months ended on March 31st. gross earnings were $2,915,135, an increase over the preceding twelve months of $351,324; net earnings $1,566,642, an increase of $149,871. Electric energy output for the week ended on April 13th was 29.5 per cent. greater than for the corresponding week of 1917.

NEW YORK—New York City

The Wayland Oil & Gas Company declared the regular semi-annual dividend of 3 per cent. on preferred stock, payable May 11 to stockholders of record May 1. A dividend of 2 per cent. was also declared on the common, payable June 11 to stockholders of record June 1.

A recent report of the National Fuel Gas Company shows that in 1917 the company had gross earnings of $8,604,622, compared with $7,278,690 in 1916. Net earnings were $4,446,494, against $7,928,240 the preceding year.

PENNSYLVANIA—Pittsburgh

The Pittsburgh Oil & Gas Company has declared the regular quarterly dividend of 2 per cent. payable May 15 to stock of record April 30.

INCORPORATED

DELAWARE—Dover

The following companies were recently chartered under the laws of this State: Fentress Oil & Gas Company, to drill and operate oil and gas wells, capital $200,000. Incorporators: A. A. Alles, A. M. Harrison, Q. L. Clovis, Pittsburgh, Pa.

A. L. McCrea Oil & Gas Company, to own and operate oil and gas wells, capital $250,000. Incorporators: A. L. McCrea, Edwin C. Maloney, John J. Boyer, Pittsburgh, Pa.

OHIO—Mingo Junction

Andrew S. Barnes, George W. Meager, Walter Ong, Casper Dallas and John J. Azallion are the incorporators of the Piney Fork Consolidated Oil & Gas Company.

OKLAHOMA—Enid

A new concern in this city is the Anlo Oil & Gas Company. The company was formed with a capital of $100,000. The incorporators are Charles N. Harmon, C. C. Fritz and Ruby Craig.

The Sharpless Oil & Gas Company has been incorporated with a capital stock of $30,000 by R. J. Clark, F. C. Clark, and E. J. Masemore, all of Enid.

Tulsa

The Red Man Oil & Gas Company has been formed here with a capital stock of $250,000. The incorporators are F. R. McCarthy, C. E. McCarthy and J. T. Nixon of Tulsa.

PENNSYLVANIA—Warren

The Will Creek Oil & Gas Company has been incorporated under the State laws of West Virginia. Capital $30,000. Incorporators: S. E. Pryor, W. J. Eagan, A. Krupp, George A. Krupp, George B. Brennison of Warren and C. L. Conn of Meadville, Pa.

GENERAL

ALABAMA—Huntsville

T. W. Pratt, E. C. Dillon, and Lawrence Cooper recently took over the properties of the Huntsville Consolidated Gas & Oil Company. It is reported that the new owners will shortly begin operating the company.

Glendale

This city is considering taking over the Southern California Gas Company's local plant and operating it on municipal account.

Taft

Properties in Section 32-12-23 controlled by the Government are to be made to yield further revenue through the establishment of a gasoline recovery plant on the Spreckles property. The Richfield Oil Company will furnish the gas.

With the installation of this compressor plant on Section 32, the production of the Richfield Company will be nearly doubled.

All receipts from the Richfield company by Receiver Payne are to go into escrow, along with the millions now at hand, received from oil sales, this income to be distributed to the various companies when the long drawn out suits with the Government are decided.

INDIANA—Winchester

...gas and oil development work in the nearby fields ... said to be extensively carried on by the Mon... Gas Company of this city.

KANSAS—Kansas City

...ans have been completed by the Wyandotte ... Gas Company, it is said, for the erection of a ... the manufacture of artificial gas which is to ... used with the natural product.

Woodson County

The Sperry Oil & Gas Company completed a gas... gas well at 1,501 feet in the northeast corner ... northeast quarter of Section 24-24-14.

LOUISIANA—Anse La Butte

...Oil, Gas & Coal Company is re... ...has a large flow of gas in its first well on this ... The gas was found at a depth of 600 feet. The ... well will be connected to the main line, some three ...

Bossier Parish

...the Dixie Oil & Gas Co. of the Texas Company ... gas well in Section ... It is said to have a rock pressure ...

Lake Grove

...

Monroe

...

New Orleans

...

Reston

...

MICHIGAN—Huron

...

NEW YORK—Bristol

...

Canandaigua

...

Dunkirk

...

New York City

...

Schenectady

...

OHIO—Cleveland

...

Hocking County

...

Holmes County

...

Knox County

...

Lancaster

In Berne Township, Fairfield Township, the City Natural Gas Company drilled a fair gas well in a test on the Michael Killbarger farm.

It is reported that the Ohio Fuel Supply Company, the Logan Natural Gas Company and the Hope Natural Gas Company, all of whom operate big plants in the Sugar Grove field, were all over one hundred per cent. firms in the recent war chest drive. Every man employed by these companies subscribed to the fund.

Licking County

The Heisey Gas Company has a light gas well in No. 2 on the John Gourley farm. The Wehrle Stove Company has 500,000-cubic feet of gas in its No. 2 on the A. A. Haines farm.

Perry County

In Thorn Township, the Columbus Natural Gas Company drilled a dry hole in No. 2 on the M. Shaner farm, Section 3, making the second dry hole for this farm.

The Heisey Gas Company completed an exceptional gas well on the J. Burkett farm, of 75 acres, Section 8.

The Ohio Fuel Supply Company drilled a fair gas well on the Charles Boring farm, Section 3, and a light gas well in a test on the Anna Rarick farm, Section 6.

Vinton County

In Richland Township, the Ohio Fuel Supply Company drilled a fair gas well in a test on the H. M. Whitecraft farm, Section 33, and a good gasser on the John Cassill farm, Section 25.

OKLAHOMA—Bixby

Davis, Younger and others' No. 2 on the Beggs farm, in the northeast of the southwest quarter of Section 14-17-13, is a 10,000,000-foot gas well with a 500-pound rock pressure. The gas comes from sand at 1,518 feet. The Humble Oil Company's No. 4 Mingo, in the southwest of the northeast quarter of Section 27-17-13, is good for 5,000,000 feet of gas from sand at 1,485 feet.

Bristow

The natural gas pipe line now operated by the Bristow Gas Company is to be replaced with pipes of a larger size.

Drumright

The Drumright division of the Oklahoma Gas & Electric Company has sent three more employes into Government service. They are I. J. Lyons, Private, 363d Infantry; Hal Whittenburg, Camp Funston, Kansas; and S. H. Kurry, U. S. Navy.

Martin Sands, general bookkeeper of the El Reno division of the Oklahoma Gas & Electric Company, has entered the Navy.

Grove

On the Witty farm a 3,000,000-foot gasser has been completed at a depth of 227 feet.

The Le Flore County Gas & Electric Company has a 3,000,000-foot gasser on the Closter farm, near Poteau.

Le Flore County

The American Indian Oil & Gas Company is reported to have completed a 25,000,000 cubic foot gasser in Section 28-7-26 in the Poteau field.

Okmulgee County

The Okmulgee Producing & Refining Company has a 35,000,000 gasser in Section 8-13-12 on the Harjo farm, at a depth of 2,105 feet. W. B. Pine is associated with the Okmulgee Company in this project.

W. B. Alexander completed a 15,000,000-foot gasser on the Wigton farm at a depth of 2,154 feet.

FROM THE PEN OF THE EDITOR

STIMULATING PRODUCTION

I

WEST VIRGINIA NATURAL GAS ASSOCIATION

I

tions, and it is anticipated that the pleasures of this meeting will be enjoyed by an attendance fully as large as has been had at the conventions of Charleston and Parkersburg.

Huntington, W. Va., where this year's convention is to be held, enjoys the record of being one of the best convention towns in the state, it having ample facilities.

Secretary Robinson was in attendance at the convention of the Natural Gas Association of America, recently held in Pittsburgh. He took occasion at that time to focus upon certain things that may be looked forward to as matters of interest in connection with the convention at Huntington.

The thing to do is to come out in full force July 24th and 25th, and make the 1918 patriotic convention something long to be remembered as attractive, interesting, and thoroughly worth while.

FUEL ADMINISTRATION ANNOUNCEMENT.

BETWEEN May 20th and July 19th the prices for petroleum products to purchasing agencies of allied governments with the authority of the War Industries Board have been arranged by the oil divisoin of the United States Fuel Administration as follows:

F. O. B. Gulf Ports.

		Per Gallon
FUEL OIL	British Admiralty Specifications, 150 Abel Flash	5.50c of 7¼ lbs.
FUEL OIL	U. S. Navy Specifications	5.25c of 7¼ lbs.
STANDARD WHITE REFINED KEROSENE	135 Fire Test, Minimum gravity 44 Beaume	7.50c of 6½ lbs.
GASOLINE	U. S. Navy Specifications	21.00c of 6 lbs.
AVIATION NAPHTHA	British Specifications, 302°F. final boiling point	30.00c of 5¾c lbs.

F. O. B. Norfolk, Baltimore, Philadelphia and New York.

FUEL OIL	U. S. Navy Specifications	7.50c of 7¼ lbs.
STANDARD WHITE REFINED KEROSENE	135 Fire Test, Minimum gravity 44 Beaume	8.25c of 6½ lbs.
GASOLINE	U. S. Navy Specifications	23.50c of 6 lbs
AVIATION NAPHTHA	British Specifications, 302°F. final boiling point	32.00c of 5¾ lbs.
MEXICAN REDUCED OIL	14/16 gravity for bunker purposes ..	6.00c of 7½ lbs.

Approved, M. L. REQUA,
Director.

WELDING TORCHES.

THE welding torch seems a very simple affair, and yet men and concerns have put almost an infinite amount of time, thought, and labor upon the developing of a torch that will be in every respect exactly right.

There are cutting torches especially designed for that particular work. Then there are combination cutting and welding torches, and there are torches designed only as welding torches.

It is exceedingly well to have the proposed line of work known to the torch manufacturer so that he may assist in suggesting what particular torch is best adapted to the proposed work.

Torch manufacturers, if they are turning out the right sort of product, well understand the needs of welders in various specific lines of trade. Therefore, it would be well in every instance for the prospective buyer of a torch, or of torches, to see to it that he becomes thoroughly well advised on the capacity, minute details, and quality of torches offered, before purchasing.

There are torches and torches. Do not be misled, but instead, consider well before buying, and thus determine upon which form of torch, whether combination cutting and welding, or torch with other features would be best for the work in hand.

Every torch manufacturer knows much about the business, and the advice of such a one should be written for in order that the prospective buyer may be well equipped with information before entering upon a direct purchase.

There are several concerns among our advertisers who are supplying oxy-acetylene welding equipment, and a prospective buyer should get information from all sources, and then arrive at a determination as to what torch to buy.

Some combination cutting and welding torches can excellently be used on various lines of work. However, a torch that is made exclusively for cutting, or exclusively for welding should preferably be used when certain other conditions exist. A good torch, a good welding stick, and a well-informed welder will turn out a gas-tight main.

A UNIQUE SALES LETTER.

The American Meter Company, of New York, Mr. W. K. Harrington, Manager, recently sent out a very effective letter to the gas fraternity. The letter as framed was an announcement of the fact that they are manufacturers of Gas Apparatus, Calorimetry and Photometry Equipment, Meter Provers. The letter was not an appeal; it took the form of a notification with a strong suggestive element in view between the lines. Such notifications to the trade are far more effective than communications of the ordinary type.

Thirteenth Annual Meeting

Meeting of Natural Gas Association of America a Notable Success Even Without Exhibits of Equipment, Though Necessary Absence of Equipment-Display was Regrettable.

WITH a purpose to aid in winning the war, it was decided by the executive board of the Natural Gas Association of America, and of a similar board of the Natural Gas Supply Men's Association, this year to omit the exhibiting of equipment and supplies for natural gas uses.

In the past, the exhibiting of appliances of many types has proven a very great card, and many have been tempted to attend the convention who might, to a certain extent, feel indifferent unless the newer things, and many of the staples were displayed for their inspection.

In these war times, when it is exceedingly difficult for the government to handle immense quantities of munitions, army equipment of one sort and another, food stuffs, army supplies, and necessaries for the use of the general public, on the face of it, it would have been unwise to tie up cars, or even, in a smaller degree to overload shipping facilities, by dispatching gas equipment for exhibition purposes. While the exhibits were cut-out, nothing otherwise was allowed in an way to set interest aside.

The Convention took on the aspect of patriotism evinced in various ways, and the especially large number present was a surprise to the many who had anticipated that a convention in these war times, and one without an exhibition, would probably find only a very limited number on hand.

Possibly not as many of the field-men were at the convention as have been present at times of some of the former conventions, a fact that was regretted, for the attendance on the part of these men is greatly desired, and is thoroughly appreciated.

We not only give a list of the papers presented at the convention, but will in THE NATURAL GAS AND GASOLINE

KAY C. KRICK, PRESIDENT
Natural Gas Association of America

DAVID O. HOLBROOK, SECRETARY-TREASURER
Natural Gas Association of America

JOURNAL print all of the papers in full, accompanied by the discussion of each. As these discussions and the papers themselves will be published verbatim, it will not be necessary for us to comment upon the several topics presented.

The papers offered were as follows:

"The Deepest Well in the World and the Next Deepest in America,"
By Dr. Israel C. White

"The Value of Gas Delivered at Varying Pressures,"
By Charles V. Critchfield

"Elimination of Discrimination in Natural Gas Rates by 'Readiness to Serve' Charges,"
By Samuel S. Wyer

"Auxiliary or Dual Installations for Domestic and Industrial Consumers,"
By Karl Emmerling

THE ANNUAL BANQUET AT THE WILLIAM PENN HOTEL

"The Chemical Possibilities of Natural Gas,"
By Dr. J. B. Garner

In addition to the reading of the five papers, those present had the pleasure of hearing exceedingly fine addresses on petroleum matters as affected by war conditions. These were given by Mr. A. C. Bedford, Chairman of the Petroleum War Service Committee and Chief Executive Officer and Chairman of the Board of the directors of the Standard Oil Company; M. L. Requa, Director of the Petroleum Division of the United States Fuel Administration and T. A. O'Donnell, in charge of petroleum production of the division.

The addresses by the three gentlemen just named, were made during an afternoon session of the convention when a joint meeting of oil and gas men was held. The burden of the afternoon's addresses was loyalty to the government of the United States, to our allies, and to the peoples and factory interests of our home country, such as is due from the oil and gas men in this time of stress.

As we shall publish the addresses of these three men of affairs, it will not be necessary for us to comment further here, but we earnestly urge readers of this publication to note well the points brought into focus in these three addresses.

While in many ways the two sections of the industry, oil and natural gas, are quite unlike, and under ordinary conditions the two would meet separately, in their own respective organizations, the situation is different in these war days, and by the way, the oil men in session with the gas men upon this occasion were invited from the Appalachian Division, they were guests of the Natural Gas Association.

Those present, of course, had the satisfaction of hearing the writers of papers offer their own subjects. This is generally the better way to receive a presentation, in view of the fact that the personal element adds greatly in the reading of a paper. However, next to the satisfaction of hearing a paper read, is reading it one's self, and for this reason we take pleasure in publishing the several papers in full for the benefit of such of our subscribers as could not be present.

It was originally planned to hold the sessions in the William Penn Hotel, but as the commodious room that had been placed at the disposal of the Association, was asked for by the Red Cross in connection with its drive that took place coincident with the Convention, the auditorium was used in the Chamber of Commerce Building. This proved to be a most excellent place of meeting.

During the joint session of oil and gas men, the auditorium was filled to its extreme limit leaving many standing in adjoining alcoves. Much enthusiasm was displayed when opportunity presented for a show of patriotism.

At 6:30 o'clock on Wednesday evening at the William Penn Hotel, the annual dinner was held and to this the oil men had been asked. Mr. Henry L. Doherty at the head of the Doherty interests that some years since were wholly confined to the artificial field, but are now viewed as a very large factor in the oil and natural gas field, was appointed toastmaster.

REPORT OF BOARD OF DIRECTORS

REPORT OF COMMITTEE ON NEW MEMBERS

Frank L. Chase Manager Gas Dept., Lone Star Gas Company, Fort Worth, Texas.
H. V. Couch, Purchasing Agent, United Natural Gas Company, Oil City, Pa.
Wm. G. Cummings, Proprietor, Wm. G. Cummings, Pittsburgh, Pa.
Charles DeWeese, Asst. Supt. Gas Distribution & Const., Louisville Gas & Electric Company, Louisville, Kentucky.
W. J. Doebele, Agent, Ohio Fuel Supply Co., Miamisburg, Ohio.
D. M. Donehue, Producer, Titusville, Pa.
George M. Evans, Contractor, P. N. G. & Phila. Co., New Kensington, Pa.
Todd Evans, Treasurer and Manager, Barnsdall Printing Co., Bradford, Pa.
H. A. Fisher, Proprietor, H. A. Fisher Company, Pittsburgh, Pa.
James P. Fisher, Chief Technologist, Wichita Natural Gas Company, Bartlesville, Okla.
A. J. Fitzgibbon, Salesman, A. M. Byers Company, Pittsburgh, Pa.
F. D. Freeland Well Gauger, Peoples Natural Gas Company, Brave, Greene County, Pa.
S. M. Gill, Assistant Credit Clerk, The East Ohio Gas Company, Cleveland, Ohio.
R. L. Heaton, Asst. Chief Geologist, Medina Gas & Fuel Company, Wooster, Ohio.
James Henderson, District Foreman, Peoples Natural Gas Company, Imperial, Pa.
Jesse Whalen Hines, Chief Dispatcher (Gas), Empire Gas & Pipe Line Company, Bartlesville, Okla.
William Horne, General Manager & Treasurer, Pure Oil & Gas Company, Marietta, Ohio.
H. R. Hyatt, Chief Engineer, Logan Natural Gas & Fuel Company, Pavonia, Ohio.
William T. Kent, Director, Tiona Gasoline Company, Brave, Pa.
Clark Knox, Salesman, Estate Stove Company, Crafton, Pa.
F. D. Krum, Agent, Pennsylvania Gas Company, Erie, Pa.
W. H. Lane, Civil Engineer, Logan Natural Gas & Fuel Company, Columbus, Ohio.
Harry M. Leathers, Gas Meter Engineer, Cutler-Hammer Manufacturing Company, Pittsburgh, Pa.
Fred M. Lege, Jr., 1st Vice President & General Manager, Lone Star Gas Company, Fort Worth, Texas.
G. W. McCullough, Land Agent, Mfg. Light & Heat Company, Pittsburgh, Pa.
Donald W. Mackie, Manager, Bradford Supply Company, West Warren, Pa.
W. K. Mason, Division Superintendent, Carnegie Gas Company, Moundsville, W. Va.
R. A. McKinney, General Agent, The Manhattan Manufacturing Company, Pittsburgh, Pa.
John A. Miller, Chief Engineer, The Preston Oil Company, Pavonia, Ohio.
P. J. Morrissey, General Manager, Johnstown Fuel Supply Company, Johnstown, Pa.
S. E. Murphy, Mgr., Empire Gasoline Co., Bartlesville, Okla.
Franklin C. Murray, Representative, The B. F. Goodrich Rubber Company, Akron, Ohio.
C. O. Nordensen, Mgr., Huessener Engineering Company, Pittsburgh, Pa.
J. F. Owens, General Manager, Muskogee Gas & Electric Company, Muskogee, Okla.
W. A. Pannabecker, Supt., Preston Oil Co., Lancaster, Ohio.
J. E. Parsons, General Auditor, The Ohio Fuel Supply Company, Pittsburgh, Pa.
D. V. Peden, Secretary to the President, The East Ohio Gas Company, Cleveland, Ohio.
Jesse Rearick, Chief Engineer, Logan Natural Gas & Fuel Company, Mt. Vernon, Ohio.
James D. Robertson, Representative, Pittsburgh Valve, Foundry & Construction Company, Pittsburgh, Pa.
Fred B. Seem, Supt. Tel. & Tel. Empire Gas & Pipe Line Company, Bartlesville, Okal.
Charles Seibert, Agent, Ohio Fuel Supply Company, New Lexington, Ohio.
G. E. Shoup, Purchasing Agent, Medina G. &. F. Co., Wooster, Ohio.
W. H. Snyder, Oil & Gas Producer, W. H. Snyder, Beaver, Pa.
Charles M. Staigers, Lease Agent, L. G. Neely, Winchester, Ky.
Robert J. Wallacy, Supt. Contracts, Empire Companies, Bartlesville, Okla.
Olandus West, Pres. Vesper O. & G. Co., Clarksburg, W. Va.
Wm. H. Whiteley, with Wm. G. Cummings, Pittsburgh, Pa.

REPORT OF THE SECRETARY-TREASURER

To the Natural Gas Association of America,
Gentlemen:

I have the honor to present the Annual Report of the Secretary-Treasurer, for the year ending May 1, 1918.

MEMBERSHIP REPORT.

Honorary Members		
As per Membership Rolls, May 15, 1917		8
Active Members		
As per Membership Rolls, May 1, 1917	1,168	
Elected May 15, 1917	262	
	1,430	
Released from Membership May 15, 1917	142	
Died during the year	9	
	151	
Total		1,279
Total Membership this date		1,287

FINANCIAL REPORT.

RECEIPTS.

Balance on hand, May 1, 1917	$ 5,084.08
Dues	4,480.00
Initiation Fees	1,310.00
Books of Proceedings, Sold	30.00
Refund of Whitehead & Hoage Co	30.18
Total	$10,034.26

Disbursements

Printing and Stationery	$ 3,345.99
Stenographic Report, Twelfth Annual Meeting	215.80
Clerical Assistance	81.45
Salary Secretary Treasurer	1,000.00
Allowable Department Prizes	100.00
Badges and Buffalo Convention Expenses	441.05
Postage Express and General Expenses	632.19
Balance on hand Delaware Savings Bank	6,254.52
Total	$12,471.00

SPECIAL FUND NO 2

Treasurer's Special Fund, for the maintenance of the Association's Pittsburgh Office, for the year ending May 1918

Receipts

May 1	Balance	$ 6,282.00
	Mailing Lists Sold	21.00
	Addresses of Members Reduced Sold	98.21
Oct	Hemermann Gas Company Greenville Pa	25.00
	Logan Natural Gas Corporation Pittsburgh Pa	100.00
	American Natural Gas Company Pittsburgh Pa	200.00
	Carnegie Natural Gas Company Pittsburgh Pa	100.00
	Greenville Natural Gas Company Greenville Pa	25.00
	Delaware Gas Company Delaware	25.00
	Ridgway Light & Heat Company Ridgway Pa	5.00
	United Natural Gas Company Oil City Pa	800.00
	Clarington Gas Company Clarington O	25.00
Nov 2	Pennsylvania Gas Company Jeannette Pa	100.00
	Jefferson Gas Company Waynesburg Pa	50.00
	Manufacturers Light & Heat Company Pittsburgh Pa	200.00
	Logan Gas & Water Company Lancaster O	25.00
	Ohio Fuel Gas Company Columbus O	200.00
	North Penn Gas Company Coudersport Pa	25.00
	Buffalo N Y	100.00
	Crystal Gas Company Bradford Pa	25.00
	B & S Natural Gas Company Bradford Pa	25.00
	Wheeling Natural Gas Company Wheeling W Va	200.00
	Fairmont W Va	50.00
	Texas Gas & Electric Company Texas	100.00
	Kanawha Gas & Electric Company Charleston W Va	50.00
	Southwestern Gas & Electric Company Shreveport La	100.00
	Carbon Fuel Company Charleston W Va	25.00
	Dunbar W Va	50.00
	Lanes Pipe Line Company Lanes Kansas	25.00
	Southwestern Gas & Electric Company Chicago Ill	100.00
	Little Rock Gas & Fuel Company Little Rock Ark	50.00
	Western Ironmasters Protective Association Pittsburgh Pa	25.00
	Central Pipe Line Company Chicago Ill	25.00
	George H Lines Company Pittsburgh Pa	25.00
	East Ohio Peoples Natural Gas Company Cleveland O	25.00
	Marshall Gas Company Marshall Texas	25.00
Dec 12	Columbia Gas & Electric Company Charleston W Va	200.00
	St Marys Gas Company St Marys Pa	50.00
	Randall Gas Company Randall W Va	25.00
24	Venita Gas Company Bartlesville Oklahoma	25.00
Nov 24	Lone Star Gas Company Fort Worth Tex	250.00
	Rock Run Fuel Gas Company Pittsburgh Pa	25.00
	Manufacturers Natural Gas Company Harrisburg	25.00
	Malta & McConnellsville Gas Company Bradford Pa	25.00
Dec 8	Mansfield Gas Company Mansfield Pa	25.00
	Allegheny Heating Company Pittsburgh Pa	200.00
	Equitable Gas Company Pittsburgh Pa	200.00
	Portsmouth Gas Company Portsmouth O	25.00
	East Ohio Gas Company Cleveland O	25.00
	Moon Run Gas Company Coal Center Pa	25.00
	Joplin Gas Company Joplin Mo	25.00
4	Potter Gas Company Pittsburgh Pa	100.00
	Commercial Oil & Gas Company Nebraska Oklahoma	25.00
1918		
	Iroquois Natural Gas Company Buffalo N Y	100.00
Jan 15	Central Kentucky Natural Gas Company Oil City Pa	25.00
Feb	Peoples Gas Supply Company Pittsburgh Pa	100.00
8	Equitable Gas Company Pittsburgh Pa	100.00
	T W Phillips Gas & Oil Company Butler Pa	100.00
	Nebraska Natural Gas Company Little Rock Ark	200.00
	Pennsylvania Natural Gas Company Pittsburgh Pa	25.00
	Ohio Fuel Gas Company Columbus O	25.00
Mar	Texas Gas Company Pittsburgh Pa	25.00
	Southwestern Gas & Electric Company Shreveport La	100.00
	Wheeling Natural Gas Company Wheeling W Va	200.00
	Kanawha Gas & Electric Company Charleston W Va	50.00
	Carbon Fuel Company Charleston W Va	50.00
	Southwestern Gas & Electric Company Shreveport La	100.00
	Central Pipe Line Company Chicago Ill	25.00
	Little Rock Gas & Fuel Company Little Rock Ark	50.00
	Western Ironmasters Protective Association Pittsburgh Pa	25.00
	Texas Gas Company Pittsburgh Pa	25.00
	George H Lines Company Pittsburgh Pa	25.00
	East Ohio Peoples Natural Gas Company Cleveland O	25.00

...ne and presidents go, and time and again we ... The King is dead! Long live the King!", but ...en it comes to the work of the Secretary, it is a type ...work that goes steadily on from year to year, and ...e become so accustomed to receiving the services of the man occupying that position and saying that he is a good fellow and all that sort of thing, that we forget very frequently what that man receives from the Association does not compensate him for the amount of time and attention that he gives to his office and his duties. I say duties, because when he has assumed that office, he has assumed all the duties that go with it, and which he must perform whether or not he feels he is fully compensated in cash.

Now, in connection with this Association, having been a member for years, I want to say to Mr. Jones and of Mr. Jones a word or two. I want to say that Mr. Jones has done splendid work for this Association. It has been productive work. The Association has grown during the period of Mr. Jones' tenure of office, and I want to say the following, if I may be privileged, from the Association to Mr. Jones—(I have not been asked to do this, but I want to do it voluntarily, because I know it is deserved). I want to say to Mr. Jones on behalf of the entire membership of this Association that we are exceedingly grateful to him for all the good work he has done. It has been manifold and it has been exacting and in many instances it has been difficult work to be performed.

That Mr. Jones has done the work well, goes without the saying, and I ask the President for permission to offer a resolution, that a vote of thanks be extended to Mr. Jones, now as he is retiring from office in this Association, for the excellent work that he has done for so many years as our efficient secretary and treasurer.

MR. JOSEPH F. GUFFEY: I take pleasure in seconding the motion.

PRESIDENT KRICK: Gentlemen, you have heard the motion. Are there any remarks? Mr. Bigelow moves that a hearty vote of thanks be extended to our retiring Secretary and Treasurer, Mr. T. C. Jones, for the efficient services rendered by him to the Association.

The above motion having been duly seconded was then unanimously adopted amid applause.

MR. T. C. JONES: I certainly appreciate the kindly feeling extended by Mr. Bigelow and also thank you for the resolution just passed.

...Okla.

...NT KRICK.

...ween, I take great ...next president, Mr.

...g the duties as Presi-

...members of the Natural ... I would be ungrateful ...ledge and to appreciate the ... have conferred upon me, ...plate that splendid galaxy of ...m industry who have gone ... the brilliant administration of ...

... interested in this Association, ... I have always felt that an ... representative of a great industry ... effort. I have taken great pleasure ...wth and its progress. I realize that ... time, with conditions in their present ... and with such great tasks before us to ... we probably will have problems before ... require the best thought and the best effort ... of all of us in their final solution.

... want to keep you but for a moment. I ... want to pledge you my best endeavors insofar ... able to exert them in bringing success to our ...vements and to assure you that I will work ...rds that end earnestly, enthusiastically and to the ...t of my ability. But success in the final analysis depends always upon your assistance, your advice, your help, and I crave that much both for myself and my fellow-officers. I thank you. (Applause.)

THE RETIRING SECRETARY.

MR. L. S. BIGELOW: Mr. President, before proceeding with the regular program, I want to say a word about what has been done for this Association for years past by one of its retiring officers.

This Association, of which I have been a member since its swaddling clothes days, has gone on year after year without interruption so far as a part of the executive work is concerned. I am referring now to the type of executive work which is consecutive in many associations as it is in this Association. Presi-

Spend, but spend Wisely. Save, and save earnestly. Buy War Savings Stamps.

Oil and Gas Joint Meeting

Joint Meeting of the Oil Producers of the Appalachian Field and the Natural Gas Association of America.

THE Joint Meeting of the Oil Producers of the Appalachian Field and The Natural Gas Association of America was held at the Chamber of Commerce, Pittsburgh, Pa., on the afternoon of Wednesday, May 22, 1918.

Hon. Joseph F. Guffey, President of The Natural Gas Association of America, in calling the meeting to order, said:

At this joint meeting of the Oil Producers of the Appalachian Field and The Natural Gas Association of America, I am going to take the liberty, as well as the pleasure, of asking one of the best known men in the oil and gas business to take charge of the proceedings for the balance of the afternoon session. He is a gentleman who needs no introduction to you. He has done much during the past year to serve his country with credit and distinction, as well as the industry with which he is affiliated. I take pleasure in introducing to you Mr. A. C. Bedford (Applause).

A. C. Bedford, Chairman of the Petroleum War Service Committee, then said:

When President Guffey asked me to take charge here today, I am sure it will occur to all of you that he made a mistake. The man who should have taken charge of this part of our program is that very highly thought of gentleman, and also exceedinly modest man, who was appointed Chairman of the Production Committee of this District, but who should have been in the Chair today. I refer to Mr. George W. Crawford (applause).

I want to say some things, with reference to that part of our discussion today which we now turn to, namely the oil question.

In considering the oil question we have got to put aside all thoughts of peace and turn our minds to war. We have got to forget conditions as they have existed in the past and turn our thoughts and our attention, and our energies to the emergency of the present. You gentlemen know, as well as I know, that the requirements for oil are such as to tax the facilities of our production to the utmost. It is therefore imperative that oil production should be encouraged and developed to the highest extent possible. To that patriotic end every oil producer should give his utmost endeavor and in doing that, he must give consideration to it, as must also the refiner, and the distributor, and the carrier, whether it be by pipe line or by ship, and he must consider the conditions of the times and not carry on his business as under normal conditions. That means that we have got to have, throughout the whole industry, the most efficient co-ordination that it is possible for us to have. That means that we have got to do our business, perhaps, in a different way from that in which we did it before. It is impossible for us to go on,—in this business at least,— as in ordinary times. It is not a time when the conditions of the law of supply and demand shall govern, or the law of competition shall govern. It is a time, as I said a moment ago, for absolute co-operation, and that means not only the co-operation of the individual with the individual in the business, but it means co-operation of the individual with the government, and the co-operation of the Government with the individual. We have got to forget many things. We have got to forget that we are in business solely and mainly as before, and as it has been up to the present itme,—for profit and for profit alone. Profit has got to be a secondary consideration. We have got to forget that we are in business to build our business up to the greatest extent possible. It is all right, and perfectly proper in ordinary times, but these are not the times for one man to climb up or to extend his business at the expense of another. We have got to forget the old animosities and prejudices. In fact, we have got to weld ourselves together as a whole, if we are to retain our business as individuals.

Now, you know, probably all of you, so that it is not necessary for me to repeat it here, how the industry has tried to meet these conditions of which I have briefly spoken.

The organization which the petroleum industry had built up had its first inception, as you will recall, at the instance of the Council of National Defense, a semi-Governmental body, and then the organization was formed which was called the Petroleum Committee, or the Committee on Oils of the Advisory Council of the Council of the National Defense which became a trade committee, representative of the trade. At the suggestion of the War Industries Board, the Council of National Defense, and the Shipping Board. it was arranged that on their written request they should continue their work. Shortly after this, Mr Requa was appointed as Administrator of the Oil Division of the Fuel Administration. The Committee got in touch with Mr. Requa, and I am delighted to say, in his presence, found in him a man of breadth of view, as well as strength of purpose, and with the broadest ideas as regards the duties of the industry and the duty of the Government, and with a

cordial reception of the idea of complete co-operation between the Government and the industry. At his suggestion the Committee was enlarged, as you know, and now numbers some thirty-four men, representative of the branches of the industry. Under its direction numerous committees have been formed throughout the country, also representative of the different branches of the industry. There have been formed two committees in this district, one on production, the chairman of which is Mr. Messner.

These two committees, co-operating with the parent committee, are intended to be at the suggestion of Mr. Requa, the point of contact between the industry and the Government, and we ask all you gentlemen today, for these committees and for the National Committee, on the part of every oil man, and also on the part of every gas man,—for the gas men are also interested in this, for there is a natural gas committee, of which your President, Mr. Guffey, is the Chairman, also affiliated with the National Petroleum War Service Committee,—we ask for each of these committees, and for the National Committee the individual and active support of these industries. With your support, with your help, lined up behind their committees, there is nothing that the industry cannot do that is humanly possible, to meet the war conditions, and to provide, as has been done up to the present time, at least every gallon of oil that is necessary to fully supply our own Navy, our own Army, and the navies and armies of our Allies (Applause).

Now, the situation which, of course, comes home to every man is more or less personal. We wonder, under present conditions, where we are being led to, and what the end will be. It is very simple to my mind, if the industry conducts itself as it should.

The broad principle which Mr. Requa has laid down is fundamentally correct, and one that the industry, as a whole, can be thankful for. Mr. Requa has said that he expects the industry to govern itself, and he construes that his duties are to help and assist the industry in those matters, where the industry cannot itself perform what is to be accomplished, without such assistance. Take for example, the question of the delivery of goods with a shortage, such as existed during the winter, in fuel oil, and as in all probability will exist again during the coming winter, the question of priority naturally comes up. A company with numerous contracts on its hands, could not determine for itself the priority of delivery, when it could not fill, through its supply, all the contracts which where upon its books. It could not discriminate among those with whom it had contracted relations without incurring the penalties or without incurring lawsuits for damages. Consequently the Government had to come in and say, "Such and such is the order of priority, and you must deliver the oil you have available in such and such order."

Mr. Requa came to the rescue of the industry at this critical time with the estimate of these priority orders. Now, of course, while in general that is the proposition, yet at the same time, we recognize the fact that the Government—and when I say the Government, I refer to Mr. Requa, for he is the man with whom you will have to deal as personifying the Government,—the Government must have the final say in all of these matters, and while it is not desired to exercise a drastic control,—and with proper care of the industry, drastic control will not be necessary,—yet the industry must be conducted more or less under the direction of the Fuel Administration.

That brings us to consider the question which is paramount in many minds at present. The price question has agitated the industry considerably, especially that part of the industry concerning the new production of oil. I think there has been some psychology applied with reference to the subject, as it has been working itself out in the minds of the producer. At times, however, there have been some uncertain features with reference to the industry which has caused much hesitancy, but I believe that these uncertain features have more or less been cleared away. The atmosphere is clearer today than it was before. The principle has been announced that the small man must live, and must be allowed to live, and that fair profits would be permitted has been clearly established, and that because of the necessities of the case we must encourage especially production. But that does not mean for a moment anything more than fair return, and fair prices, and not run away prices, and any one who takes advantage of the situation to exact undue and unlimited profits as occasions may offer, will certainly find that the stern hand of the Government will be found restraining him without mercy. As to the merits of such a principle, in these times, I think we all agree, for we are proud to feel that the industry, at least up to the present time, and with very few exceptional instances, has not been on what might be called a profiteering basis, but an earnest endeavor has been made to conduct the business conservatively, wisely, and with due consideration to the public, and it has only sought to charge fair and reasonable prices, and such advances as have been made have been due to the fact that the producers had to be stimulated, and in order to get the necessary crude oil, higher prices had to be paid on account of many conditions with which you are all familiar, and that I do not need to go into.

Now, we welcome any investigation of the industry that shall demonstrate the fact whether we are profiteering or whether we are not.

Speaking for the Petroleum Committee, I want to say that they wish to feel, and they wish Mr. Requa to feel, that the industry, as a whole, is absolutely sincere when it stands up and says to the public that it is going to carry on this industry with a pure spirit of patriotism and love of country (great applause).

Now how can we get at it? The way has been devised. It is generally or tacitly understood, I think, with the Fuel Administration that prices throughout the country shall remain as they are. If, for any reason the industry, or any part of it, feels that prices should be advanced, it is expected and hoped that they will take it up through the proper Committee, who will study the question. If it is a local question, it will be

War Savings Stamps are worth Self Sacrifice

will offset that with another bid, and you will find yourselves in the situation of pyramiding your prices. Then, where are you going to stop? There would be nothing left to be done but for the Government to step in and say. "Enough; this has got to stop."

Now, Gentlemen, we have been warned in this matter. We know the conditions. I am sure we will all be patriotic enough to comply with these reasonable requirements. We will show no selfish interest in our earnest endeavor to do our bit. We will all see the absolute, prime necessity for it, and as I said before, we will govern ourselves accordingly, in a pure spirit of patriotism, and do that which is necessary, and I am sure you are with me in assuring Mr. Requa that that is our intention as an industry, (more applause).

Gentlemen, I now take great pleasure in introducing to you Mr. Requa (long continued applause).

Hon. Mark L. Requa. Director of the Oil Division of the United States, Fuel Administration, then said:

Mr. Chairman, Mr. Bedford, and Gentlemen: It is very difficult for the layman, who does not come in intimate and close contact with affairs in Washington to fully realize, not only the magnitude but the diversity of the problem that confronts the Government in its dealings with the Petroleum Industry, to say nothing of its dealings with the entire industries of the United States. I approach this particular problem somewhat disillusionized because of an apprenticeship served under Mr. Hoover, in the Food Administration. There was a time when I was quite confident that there were a great many non-essential industries in the United States, but now I am vainly looking for one industry of which it could be said, "it is a non-essential."

In the distribution of oil under the priority classification I found most unexpected obstacles in the way.

A man in New England was manufacturing chain. and he was in priority class 12. Manufacturers of tractors for farmers were in class 9, and the man who was making the tractors came to me and said, "Unless we can buy some chain, we cannot run the tractors, and if we don't run the tractors, the farmer cannot plow, and if the farmer does not plow, there will not be any wheat," and it became obvious that there must some way be discovered of supplying the man who makes chains with fuel oil.

A man in Florida was manufacturing Fuller's earth and we found it was necessary for the oil refiners to have Fuller's earth if they were to make proper lubricants, and so it goes on almost without end, that one part is dependent upon some other part; that the various departments of the oil industry must supply their production efficiently and satisfactorily, or some other part of the Government program will fail, because a man somewhere here in the vicinity of Pittsburgh, who is manufacturing rivets, ran out of fuel oil.

I was advised by an investigator from the Shipping Board that the ship building program of the United States was in danger unless the man who is canning vegetables, and other canned products, could be supplied with tin cans for there must be an adequate supply of canned products for export, and yet at the same time there is an insistent demand for tin cans in which to put the products of petroleum. So that if we are adequately to appreciate the existing conditions, it can only be by means of a consolidated picture that will show in general outline the requirements of all the branches of the Government, and to meet that very situation there has been organized in Washington what is known as the Priorities Committee of the Council of National Defense.

That committee grants priorities. Then there is the Requirements Committee that meets every morning and receives requests from the various departments for their requirements.

The Government in its program alone,—to say nothing of the industrial life of the nation. can today consume practically the entire iron and steel output of this nation. It is obvious, therefore, that there must be some distribution of those supplies. Everybody may not receive all that they require, but everybody will receive something.

The oil problem to a very large extent is primarily a problem of transportaition. Because of the requirement for ships to carry the oil to Europe, a great many tankers upon the Atlantic Seaboard have been diverted to Trans-Atlantic service. It is needed, to adequately meet that situation, practically the consolidation of the oil industry of the nation.

The sales managers of all the large selling organizations are meeting regularly in New ork. The cards are all on the table, face up. There are no secrets. Every man knows the ability of everybody else to deliver, and where there is a shortage, some one steps in and helps the deficiency. There is no other possible conduct that would adequately meet the situation, and there is absolutely no excuse for the failure to carry out a program of that character.

Such action among the oil companies themselves is obviously impossible without the assistance and protection of the Government of the United States. It involves the complete temporary abrogation of the Sherman law.

The oil industry today is acting as a unit under the direction of the Government, not only upon the Atlantic Seaboard, but upon the Pacific Coast as well. Upon the Pacific, pipe lines have been unified. One pipe line has been closed down. Oil produced in the San Joaquin valley has been exchanged for other oil that has been produced in Southern California, to the very great benefit of the public at large, and these actions have made possible serving the communities upon the Pacific Coast in a way that they could not possibly otherwise have been served. I do not think that many of us realize that the oil industry of the world today, so far as the Allied nations are concerned, centers in the United States. By a very great majority, the oil that is supplied to England, to France, and to Italy, comes from America. The export of oil has grown by leaps and bounds, and I presume will continue to grow during the present year equally as rapidly as

the past year or two years. So that we have
e the question of the supply for the Allied Gov-
ts for their greater needs, but we have as well,
sion of the supply of the individual population,
s obvious that if we are to intelligently consider
solution, we must know what those demands are
and what are the demands of our own Govern-
nt for military purposes, and the demands of our
ople

re engaged at the present time in attempting to
late the various estimates with a view of placing
single sheet, the total requirements that will be
and offset against them the total possible
that can be furnished by the United States and
had at all times a profound conviction that
n some way the oil industry of the United
would make good one hundred per cent gap

problem, speaking from the Government stand
s purely a problem of assisting the oil industry
g as a consolidated unit those things that cannot
by the companies acting separately no matter
werful they may be as private institutions. We
consider the supplies of gasoline, not only for
y purposes, but for the purposes of aviation
re the German specifications. We know what
mans are furnishing to their flying men
w what Great Britain is furnishing to her
, and we know that there is not a pint of
gasoline that should be furnished to our flyers
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If it is found
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until we know exactly what is to be answered

very question of motor gasoline is now being
red in Washington by the most best equipped
of their scientific knowledge to answer
and finally the question. The Bureau of
ds in conjunction with the Bureau of Mines
ucting extensive tests and when those tests are
when those conclusions have been ratified by
vernment officials and by the experts from the
I believe that a very definite statement can
and a very definite reason can be given for
cations that can be put out for aviation gaso
do not pretend to say at the moment what those
cations may be. But whatever they are what
ecessary to give to our men who risk their lives
defense of liberty
- whatever the specifications are they will give
to those men the best product that can be made. I am
confident that the oil industry will respond cheerfully
and will gladly supply that product. (Loud applause.)

The same thing applies to lubricating oils. The study
is being carefully made in an endeavor to determine
whether something better can be provided than is al-
ready being used. The best is none too good. Any-
thing less than the best will not be countenanced not
only by the Government but by the oil industry as well
which is supplying that product.

There is just one way that the Oil Division of the
Federal Administration can succeed and that way is
through cooperating with the oil industry, and giving
to the oil industry whatever assistance is necessary to
permit them to govern themselves wisely and well during
this crisis.

Nothing else matters today save the winning of this
War. What we have would be of little value to us if
we do not win. Everything that we have believed in,
everything that we have fought for, every tradition
of human liberty for which our ancestors risked their
lives, today is at stake and I believe that a free people
fighting in defense of those things can and will do
voluntarily every act that is made mandatory by the
autocrats of the German Empire. (Great applause.)

I am not
Industry
I have a
Lever bill
the Fuel
the service of the United States
time of its greatest need.

Few people realize how far reaching are the powers
delegated under that bill. I may say that at the
first conference I attended in New York with the
Petroleum War Service Committee the provisions of the
Lever bill were
the United States
of the allied
New
that under the
control by segregation
the Fuel Administration
industry
month. If the
of that
authority
and

the Fuel Administration that the oil jobbing industry of the United States be placed under license." That was an experience of profound gratification to me. I felt that a very great majority of the jobbers of oil did not need any regulation, but in all lines there is always a minority, that no matter what the occasion will take advantage of it, to the detriment of their more conscientious associates, and I could see no way to control that element save by licensing, and I said to the jobbers that that element would be controlled.

Under the licensing provision, rules and regulations may be promulgated of the most drastic character. The provisions are identical with those being utilized by the food administration in the licensing program, and you may have noticed from time to time that licenses have been revoked and men have been prohibited from doing business, and I want to say, with all the emphasis that I can say it, that in the oil industry, if there be men of that character in it, who are willing to take advantage of the times, whose consciences are so degraded that they propose to fatten upon the blood and the bone of the American people, so far as I am concerned, the first mistake—the first misstep will be the last, and for the period of this war they can rusticate somewhere else. They cannot do business in competition with honest minded American citizens, who recognize that their first duty is to their country, and their second duty to themselves (long continued applause).

I have considered it a great privilege to come among you gentlemen here today, and to tell you some of the problems we have to deal with in Washington, how we are confronted with an acute shortage of oil in California; how we find it practically an impossibility to convert the oil burning industries of the Pacific northwest to coal. Materials for that conversion are lacking. They cannot at this time lay up the ships to make the conversion from oil to coal burners. They dare not lay up the locomotives to convert them to coal burners. The Pacific Northwest, under existing conditions, cannot produce sufficient coal to supplant the quantity of oil now being consumed. We have nitrate fields in Chile to supply with oil. The Canal at Panama must be kept supplied. The domestic industries of the United States must be cared for, so that the necessary supplies may be manufactured for export overseas, and the needs of our Allies must be paramount importance to us in our calculation. The demands of our own force in Europe are constantly increasing, and I believe that they will increase for a considerable period of time to come.

My own impression is that this war will be won in the air with gasoline supplied by the oil men of the United States, and I can conceive no prouder distinction than to be entrusted with the responsibility, as you men are, of supplying that product.

The men who produce the natural gas of the United States have quite as great a responsibility resting upon them. There is gasoline made from that product that can be utilized to great advantage. Natural gas can be supplied in places where it will release either coal or petroleum, and to those of you who are engaged in the natural gas industry, I can but say that it is your duty, so far as you can, to keep your production at the maximum. The conditions that will confront us next winter will in all probability be as acute as those that confronted us last winter.

There is a congested area in the eastern portion of the United States, east of Pittsburgh, in which it seems almost impossible to meet adequately the demand that will be made for fuel.

Efforts are being made to convert coal burning plants to fuel oil. We are asked to supply the fuel oil and to give transportation facilities. I know that that oil can be supplied, but it does not seem humanly possible that the transportation facilities will be adequate to meet all the demands that may be made upon it during the coming winter.

This is a time, Gentlemen, when individualism must be submerged. The effort of the individual must be consolidated into the effort of the Government during this period of War. The greatness and the glory of this nation has been founded upon individual effort, but the test of democracy—the greatest test, I believe that democracy can undergo, is to gladly and voluntarily surrender that right of initiative effort in time of a crisis, and act as a unit under Governmental control, for the best interests of the nation as a whole.

Mr. Bedford has read to you a letter that I wrote him a few days ago, on the subject of the price of oil. I may say to you that the question of price is undergoing a most careful scrutiny. We have received at various times, figures of the Federal Trade Commission, indicating costs of performing various operations. Those figures we are assuming as a basis. We are reviewing them, and examining them with the object of determining what are right and reasonable and just prices at which various commodities will be sold, and in that examination the oil industry, through the Petroleum War Service Committee is co-operating most heartily, most willingly, most gladly, in an endeavor to assist us in determining the facts, and when we have determined those facts we will know the answer. We will know it in a way that it cannot be repudiated, and whatever that answer may be, it will rest with the oil industry to apply it.

Industry of any character is entitled to and must receive just compensation for its effort, and that compensation should be based upon the character of the industry, upon the hazard and upon the vicissitudes connected with it. I do not want you to think that there is any effort upon the part of the Government to interfere with the normal channels of business more than is absolutely necessary, under the conditions that exist at the present time. Action of an unwise character is far worse than no action, but we are concerned with conditions today that are entirely new and strange. The normal atmosphere of business operations is giving away to the abnormal atmosphere of War, and we must govern ourselves so as to make most efficient the petroleum industry for the winning of the war, and I am proud to say that it is my profound belief that when

put it into the hands of a lot of accountants, whom I am apprehensive about also (more applause and laughter) I doubted the necesisty.

When Mr. Requa asked me to come and assist him, and take charge of the oil production of the country, I felt that my health would not permit me to undertake the effort, and then I thought of my relationship to him, and the real knowledge that I have of producing conditions in this country, and Mexico, and because of his confidence in me, I felt that probably I could be of assistance to him in a advisory capacity.

This war demands of us,—you and I,—no consideration save national welfare, whether the thing involved is our fortune or our lives, and no man has a right, as a good citizen, at this time, with conscious thought of his Government, to shirk any duty that is put up to him, that he, with a clear conscience concludes he can perform and perform well (more applause).

I want to say to the producers here today—I am not as sure about the gas fellows, for I don't know them as well, but I know I can talk to the producers, and my conclusions about gas men are thet they are not any different, for they are the drillers of wells, and the same problems confront them that confront the oil producers, and I want to say that in so far as my work is concerned. I have a full appreciation of the difficulties of an oil operator. I have been very active, as those who know me from California will tell you, in that state, and in Mexico, and I have met all the problems that we have to meet through rather a long life of activity. If my judgment prevails,—and I believe it will as long as Mr. Requa holds his present position, because he thinks along the same lines,—the oil industry of the United States, in so far as the abstract problem of producing oil is concerned, is in no danger in our hands (long continued applause). We know your problems. We know that from ninety to ninety-five per cent of all wild cat wells drilled in the United States, were failures, and from five to ten per cent have been a success, and that this has been the foundation upon which the oil producer has built the great oil industry in this country. We know the spirit that is necessary to prompt individuals to go out and explore. We know the constant necessities of the business, and the margins that are required for the successful conduct of the business, in order to meet the constant vicissitudes which are encountered. We also know, Gentlemen, enough about it to know when your industry is in a healthy condition. If we had any other object in our official capacity than the national welfare, and if we deal with prices with any other object than to produce for this country and our Allies, the necessary petroleums, then we ought to be shot. We are accepting the responsibility of looking after the petroleum supply of this country, in so far as any Government interference is necessary, and in doing that we are going to do the right thing by you, because it is necessary to do the right thing by you for the National welfare. The machine for producing oil has got to be in a healthy condition.

I am not an expert in examining balance sheets, or auditors' reports. I defy any set of auditors in the United Staes to produce the figures which will show what a barrel of petroleum costs in the aggregate in this country (long continued applause). It is an abstract problem. It takes an optomist to pursue the game (more applause and laughter), but we have got to be supplied with the wherewith.

On the other hand I take my hat off to no man in the United States when is comes to analyzing whether or not the industry in a particular part of the country is in a healthy condition, or not, and whether it needs extra stimulation.

Now, you are going to perform in this country one of the great needs in this terrible struggle we are in, and you are going to do it voluntarily, and you are going to do it with contentment and assurance, and you are going to believe it when we say to you now, after a complete survey of the entire American continent, in your oil producing area, that we believe that the oil producing part of the nation is in a healthy condition, under present prices, and it should and will get the necessary quantity of oil where and when it is needed.

We believe, in connection with our work at Washington,—indeed we are convinced, that the time is here when it is absolutely necessary for the petroleum industry, as well as many other industries in this country, to be in a stabilized condition.

We believe in that wonderful steel industry that is so important to us in this great struggle, that they have reached a stabilizing period, plenty of margin, it is true, to leave the industry in a healthy shape, but we believe it is stabilized, and we believe the oil producers of this country can and will produce the oil necessary for the National need on the present basis of cost, and I wish to assure you that we are giving that careful consideration, and we wish at all times to be informed properly and accurately of any change of condition. I personally believe we have reached the apex of increase of price of the things you use, and knowing what it costs to produce oil, we believe that you can, under present conditions, produce that oil and leave yourselves in a healthy condition. Therefore until we know of some other things having a bearing upon your industry in such a way that it is going to produce an effect on the industry itself, indicating that it will not furnish the petroleum required, then we are going to ask you to let us help you stabilize the product where it should be stabilized in order to produce the necessary quantity and quality, and we want to assure you, or do at least after a complete survey, of the United States, that it is our earnest desire to assist you in every way we can to meet the demands that will be made upon the industry in order to assure the successful prosecution of the war.

I have probably met more producers of oil in the last few months than any one man met before, and I have not failed, in any instance, to get the heartiest support for the sentiments I have just expressed (loud applause).

I come from a state, Gentlemen, where I have spent my life, and where the price of crude oil is the lowest

You are summoned to sign the W. S. S. pledge on or before June 28th.

that it is anywhere in the United States. and where it costs the most to drill a well. I was amused at a statement Dr. White made to you in referring to a well that he spoke about in the course of his paper, in which he said that that well might have cost $50,000. Our average cost in California at the present time is about that figure. We frequently get $100,000 into a well, but of course, they are good wells, and they last a long time (more applause and laughter).

MR. BEDFORD: Some of them are dry holes.

MR. O'DONNELL: Yes, some of them prove to be dry holes. The California producer might say to us, and has said to us: "Why is it that the oil down on the Gulf Coast that is used for the same purpose that the other fellow's oil is used for, and is of the same character, sells for $1.80, and we only get $1.23 per barrel for it? In fairness to us, having the same kind of a product, we should get better prices."

Gentlemen, if you will sit down with your conscience, your God and your country, you will know that is not the right basis of argument, in this world crisis. Because you happen to be in that part of the country where God Almighty was more liberal in the distribution of his wealth, is no reason why in this particular time of the Nation's want, you should seek to enrich yourselves because some other fellow gets a better price in some other part of the country. I have had it put up to me in my travels throughout the country about the four dollar oil in Pennsylvania, and I have said to some of these fellows, "You don't know what you are talking about. $4.00 is necessary in Pennsylvania, for they have to gather it with a tin can (more laughter and continued applause), and the operators in California and Oklahoma, and some of the other wild parts of the west, lose more money rolling in the grass than would absorb the profits of some of the little farms in the East (more laughter and appulause).

But you are, nevertherless in a healthy condition. I am here to tell you that, and you are here to acknowledge it with me, and then you are here to say that we all are going to do the right thing at this time.

Now, I want to tell you something about the problems we have got. We have got to furnish the oil to fill the gap in the struggle in Europe, during the next year or two. We are drawing on our stocks all over the country heavily. We drew twenty million barrels last year, and some estimate furnished by Mr. Bedford and others of the War Service Boards of this country, lead us to believe that we might, as a maximum requirement, have to draw eighty million barrels more from our stock in this country.

I believe the gas producers are going to have the necessary pep to do their part.

In the Western country, where we produce in large quantities, it may not reach those figures. It will reach them if we do not have the right kind of spirit among the oil producers, and all of us seek to do our part.

We have a safety valve in Mexico, that is going to take care of us in time, but in the meantime we have got to furnish every barrel of oil where it is, and when and how it may be required, and we must furnish it at the time that it is needed. The time it is needed is now, while we are building ships to take care of ourselves in the future, and anybody in the oil industry in this country that is withholding their oil from the market, with the hope of a future price, that will justify them from a business standpoint in holding that oil, if he will sit down with a clear conscience and think it over, he will know that by so doing he is lowering his standard of citizenship (applause).

Gentlemen, that is something I want you to think about. We need it now. We need the oil that you gentlemen are producing here in the mid continent field, to fill the gap—for what? To drive from the earth the damnable Germans (more applause).

You know, Gentlemen, some of us are nearing the latter part of the trail of life, but we always cling to it to the last moment as a precious thing, but I want to stand here and tell you today, with all the force that is in me, that there are two conditions under which I do not care to live from now on, and one is that this country might be dominated by the German spirit, and the other is by the Bolsheviki (long continued applause).

That does not only apply to myself. I have got a couple of daughters in their young womanhood, that I think more of than I do of all the money that any of you men have piled up, and I would not trade them for all of your money, too. I say to you here and now that I want them to die with me if Germany is going to rule the world (more applause).

I take this matter seriously. I think it is very serious. I went to Washington believing, as I did, that we were not badly needed, but soon learning that it was an absolute necessity for the petroleum industry of this country to be co-related to the other departments of the Government in this great struggle. The first two months of my work in Washington were the most depressing period of my whole life. I didn't care for the business feature, or anything else. I was apprehensive of where we were going to. The endless confusion was amazing to a fellow like me, that had been having a little circle of vision, and not realizing the small margin of a great industrial nation, and finding in Washington the unsettled condition, or lack of centralized authority and responsibility that existed there, I was filled with apprehension. Men of talent were called from all parts of the nation, and had volunteered their service and had rushed to Washington into confusion and lack of authority and centralized responsibility.

I am glad to say I feel better about it now. I feel we are getting our feet on the ground, and we are going to face the enemy in the right spirit with the right men at the head of our industrial needs (continued applause).

I am not going to criticise. Far be it from me to criticise any part of our administration, and above all, our wonderful President. I am going to say to you, though, that I believe we have wasted a year in order to bring home to the American people the fact we were at ing up, for the last twenty years, our industrial machinery that was necessary to win. We were a peaceful,

reckless people. We were tearing apart instead of building up, for the last twentyyears, our industrial machinery in the country, which might have been a good thing then. I am not here to contradict it in times of peace, but it was certainly not the thing to do as we were approaching war. We have to put those machines together in the way that the biggest and strongest men in this country have wanted to put them together in times of peace. We have to put them together as a War necessity. I do not believe the American people were ready for it when we first attacked this job. I do not believe that the American people would have felt the relief they did when that appointment was made (more applause). They would have criticised.

John D. Ryan taking charge of our aviation program is almost unheard of, if you will think of the atttacks of the newspapers of the country upon that man in the past, yet the people accepted the appointment with assurance and good will.

The corporations of America are putting their talented men into our War Department. I think it is coming at the right time. I doubt whether the President, or anybody else, could have hurried it along. The American people are willing to accept it, and I thank God for it (more applause). Now, we have got our feet on the ground. We are going to start now, and we are going to start to fight, and when we get to fighting, believe me, we are going to go some (long continued applause and laughter).

This is an industrial war. The industrial capacity of this nation is going to be measured by its weakest link, and there is no link in that chain of industries that is of any greater importance than that link which you gentlemen have got to weld and to watch. You know we are going to fight; we are going to fight everything in sight (more applause), and that means you. It means you (more applause).

There is a feeling among many people that Uncle Sam is at Washington. He is not there. He is a good deal like the God that many of us worship, or think about, at least. He is invisible. He is everywhere. He is right here today. He is here in this city. He is right among you now, and to serve Uncle Sam is just as much your duty as it is mine.

Notwithstanding I have accepted an official job that does not put any greater responsibility upon me than it does upon you, you must attack everything within your sight that needs attacking. That is the right spirit of Americanism, and above all, you must attack that damnable thing that is going throughout this Nation, the German propaganda (long continued applause), but in attacking that, spread a propaganda of your own, an American propaganda (more applause), and that brings home to me something I am rather embarrassed in saying in front of Mr. Bedford and Mr. Teagle here, today, but I want to say to you producers, so that you can stamp the poisonous snake that is issuing poisonous rumors to the country whenever it comes within your vision.

You know—whether justified or not, is not the point at this time,—that the whole people of this Nation will not get a square deal from public opinion without great effort on their part. It is a popular thing to attack. It is a thing for politicians to roll around their tongue. It is poisonous, no matter if issued by politicians, or hawked about the streets, or in our town halls, as if it was paid for by the Geramns.

I want you with me here today, to forget yesterday for today and tomorrow, and act accordingly, and in that connection, you are going to meet with rumors in connection with Mr. Requa and myself. I have been for twenty-eight years an active developer and producer, a field man in California, a place where twenty-five per cent of all the petroleum produced in the world was produced for a number of years. In my entire career I have never played in the front yard or the back yard, directly or indirectly, with the Standard Oil Company. I joined all the independent wild schemes that were ever promoted on the Pacific Coast (more laughter and applause). I was for ten years on the Executive Board of the Independent Oil Producers of California, one of the most active competitors of the Standard Oil Company that ever existed in the United States as an organization of that kind. I am telling you this Gentlemen so you can defend Mr. Requa and myself when somebody says that "I have seen Tom O'Donnell going up the stairs at 26 Broadway and something is wrong (prolonged laughter and applause)."

I am going up the stairs at 26 Broadway. In fact I will tell you—there is no secret,—I have been there already (more laughter and applause), and I am going up those stairs as many times and as frequently as my duty calls me there.

I am going to go anywhere in the United States where I think there is a hidden German, and drag him out, if I can (long continued applause and laughter).

Don't take me too literally, Gentlemen, for I can say, from personal knowledge, that there are no hidden Germans to be found at 26 Broadway, and I am going to wind up the subject of the Standard Oil Company for no reason but a wholesome one, by saying to all of you, that every person that I have met and been with, and worked with, which has included nearly all of the Standard Oil boys within the last four months, has shown that degree of patriotism and sacrifice that would lead me to say that the Germans better go back to Berlin quick if all of the American people attack this problem with the same spirit that every single one of these men are attacking it (more applause). I never saw a more complete spirit of sacrifice than I have met in that office. I at no time ever heard anything that led me to believe that any but the utmost loyal American spirit prevailed and above all they are American through and through, and whatever they have is on the table for Uncle Sam to take if he needs it.

Their lives are in this work just as wholly and completely as any man's in this room, and that is the thing that I want you gentlemen to help spread. But whenever you see that poisonous stuff cropping out, stamp on it like you would throttle the man who talks in favor of the Kaiser, because he is talking in favor of the Kaiser when he wants to bring up old prejudices at a time like this.

We had a recent experience down in Washington where a very important committtee was listening to our land troubles in the West, the most important thing we have in connection with our petroleum industry in the west, where thoughtlessly or with malicious purpose—I do not know which—but I think thoughtlessly into that investigation were injected the words "Standard Oil." It was suggested that the Standard Oil might be interested in those lands, and they immediately forgot what they were there about, and spent weeks trying to find out if the Standard Oil Company owned any of it, and if they did, that was enough. It was wrong. That is the popular thing politically to say and do. Now, we want to stop all kinds of wrong propaganda. That is going to be stopped, not by me talking about it here, or at a few town halls throughout the country, but by you gentlemen,—by every one of you, and I think every one of you that has got the thought in his mind to express that kind of a sentiment at this time, and to keep alive the old prejudices until the war is over is not in favor of this family of ours, but he is doing his country a great injury and his family a greater injury.

A good many years ago, when I was a boy and first went West, I washed dishes in a restaurant. It was a rough community, a rough people, and a cheap restaurant. (Laughter and applause.) In those cheap restaurants they have rather heavy side dishes. There were two cooks, a man and his wife, and some dispute occurred between the man and the wife, and he hit her with a frying pan. I had this dish in my hand and I made a good shot at his head, and it was effective. But when I got out of that kitchen, I was a fit subject for the hospital, and the woman did the most of the damage. (Long continued laughter and great applause.) I tell you, Gentlemen, that same family spirit is something we are going to show here in this war. (More applause.) You are going to do it. You are going to help everywhere. And I want you to go home—you producers who believe in me and believe in our work, I want you to go home and everyone of you work to win the war. That is the business of the hour. Don't knock at home. Don't knock on the street. If you have to knock, come down to Washington and knock yourselves hard as you want to at our doors, and we will listen to you. (More applause.) We want your help. We have got to have it. We are not "super" men. There are none of them except in Germany. We are going to fail, unless we get the united support of the oil industry of this country. We need your talent; we want you to point out to us when we are going along a path that some of you may feel to be wrong—point it out to us, why you think we are wrong. Come there as often as you want. Come freely. We are not thin-skinned. We don't want to run for office after this is all over either. (More laughter and applause.) We will stand by any criticism that is given in the right spirit. When you see us going wrong, say so.

I want to say just a word—Mr. Bedford, I don't know how long I have been talking, but too long I know, but I want to say just a word in conclusion on the labor question. You know that is a problem in which we are all interested very much. I simply want to say this, get out and talk to your men. Encourage them. Pay them what they are entitled to. But don't allow the wrong kind of a fellow to talk to them. There has been in this country too much rattle brained loose talk to the labor element of the country. Some of our labor union leaders are able, conscientious and loyal citizens of this country. Others are not. You must go among your men and instill into them yourselves the spirit that this is the time to do. It is no time to get shorter hours and do less work. Stir up a loyal patriotic spirit among the men engaged in your industry. You fellows have got to do it yourselves. You have to talk the fellow down that is talking to them about German propaganda.

I want to close by saying that I consider this war a serious matter. I consider your part in it a serious matter, and I do not want you, any of you, today to think of joining or consenting to a "sauer-kraut" peace. (Great laughter and prolonged applause.) The German will have in his left hand the pen with which to sign it; with his right hand behind his back full of cheese, and he will ram it in your nose, and say, "You have got to like the odor." (Long continued applause and great laughter.)

CHAIRMAN BEDFORD: I am sure we all appreciate the talk of Mr. O'Donnell. He talks a language we can all understand. We know when he talks that a man is talking to us. (Applause.) Time is going along. I should like very much if one or possibly more of the members of the advisory committees on production who may happen to be here would say a word. I will ask Mr. Phillips, Vice-chairman Advisory Committee Appalachian Production, Eastern Division, to say a word.

MR. PHILLIPS: Mr. Chairman and Gentlemen Representing the Oil and Gas Industry: We meet here first as patriotic citizens; second, as business men; and third, as producers of oil and natural gas.

As patriotic American citizens everything that we have that is worth having; everything that the generations that are following us might have that is worth having, is involved in this war. As business men, we are reasonable men. Were that not the case, we would long since have been eliminated from the business. As producers of oil and natural gas, we realize that we are engaged in an industry that is absolutely vital, absolutely essential to the Government.

Now, the Government has appointed advisory committees in various sections of the country. I take it that these committees are for the purpose of eliminating, as far as possible, a great deal of suggestion and comment and criticism which would prove of no particular benefit in this crisis, and to make an accurate presentation of the petroleum and natural gas situation in these various districts so as to assist the Government in every way we can to help win the war.

We have a committee, Appalachian production, with its headquarters in this city, and that committee, regardless of how busy the men are who are connected with it, are always glad to take up any suggestions, and to answer any questions that may be propounded. In fact

it acts as a clearing house, so to speak, in the way of gathering facts and data and information needed at headquarters, and then forwards what they think of value on to Washington.

The oil industry for years and years has been running with as little friction and as smoothly as possible, and it is our duty during the balance of the war to see that the oil and gas men run their own business without any internal friction in their business at all.

As far as the advisory committee is concerned, I know I speak for them, and I believe I voice the sentiment of all the people connected with the industry when I assure the people at Washington—Mr. Requa and his co-workers—that we will do everything within reason—more—we will do everything within reach in order to help carry out the suggestions that they may have to make. (Applause.)

CHAIRMAN BEDFORD: I would like to have a word from Mr. J. C. Darnell, chairman of the Advisory Committee, Appalachian Production, Western Division.

J. C. DARNELL: I do not propose to make a speech or go into any details.

I am chairman of the Western Division of Appalachian Production, consisting of the western part of Ohio, Illinois, Indiana, and Michigan. They are old fields. Ohio is very old. And there is no chance to drill any big wells. We do drill some wells, and, of course, by so doing, we keep up the production fairly well. But we are producing from wells that are averaging less than a half barrel per day.

I have heard a good deal said about fixing the price to suit the well that produces a half or a quarter of a barrel of oil per day. That is impossible. You cannot fix a price for oil that will make it profitable to produce oil from that kind of wells. But we are keeping alive everything that we possibly can. Very many of the wells in our country are being run at a loss. That is to say where there might be a good many wells connected together, two or three of the wells might be doing practically all of the work, and the others, of course, doing scarcely anything. It brings down the average. But we are doing the best we can, and we will continue to do all we can to keep the production up and to increase it if possible.

We had a meeting of our committee in Toledo on the 13th of this month, and we took a solemn vow there (and the gentlemen were all enthusiastic) and said that we would do all that we possibly could to uphold the administration and Mr. Requa and Mr. Bedford, and I think that that is about all I could say in reference to the matter. Our hearts are in the work, and we wil' do everything we possibly can to assist in getting the oil which is now needed for the Government in this great work of winning the war. (Applause).

Our men in the trenches and in the submarine chasers are doing their part. Are you doing your part? Buy War Savings Stamps to your utmost capacity.

CONSERVATION OF GAS

Report of a Committee Appointed by the Natural Gas Association of America

BY A. J. DIESCHER, CHAIRMAN

DURING the past year, there has been a general improvement in gas conservation matters. Operators for oil and gas have taken a greater interest in preventing waste and sealing-off the gas sands through which they drill.

Several flagrant wastages of gas occurred during the year, principally in Northern Texas and in the Elm Grove field of Louisiana. In the former case the wastage was voluntary while in the latter it was accidental and every effort was made to close in the well which had broken loose.

In Northern Texas, wells of five to ten million feet open flow of gas are allowed to blow to carry the oil to the surface, although the gas sand is several hundred feet above the oil sand. There are no laws in Texas prohibiting waste and for the present it is strictly a matter of the operator's conscience whether he will protect the gas or not.

The use of casing-head gas for gasoline manufacture has tended greatly toward a better attitude generally, respecting conservation. The amount of casing head gas wasting, while greatly reduced over past years, is still a very great item. It is estimated in West Virginia there are over one hundred million cubic feet blowing to the air daily. There is no doubt as much gas going to waste from this source in Oklahoma and other States. While it is not gas which would be available for entering a gas trunk line without compression it has its bearing upon general natural gas conservation.

In Osage County, Oklahoma, there has been a waste of about two billion feet of gas during the past year from one lease which was of high rock pressure, four hundred pounds, during a controversy whether it was or was not casing-head gas. Other than this, Oklahoma is practically free from high pressure gas blowing to the air. The Oklahoma authorities have greatly extended and improved their regulation of conservation and have won the good will and regard of oil and gas operators. Their work stands out as an example of what can be done through governmental conservation, and is a good guide for other States to follow.

Perhaps the best example of gas and oil conservation in the United States today is on the property of the Standard Oil Company of California at Fullerton, Cal., where they are producing large volumes of oil and gas in the same sand, separating the gas and oil at the surface, absorbing the gasoline from the oil, and recovering all of the oil, gas, and gasoline from their property without waste. The oil and gasoline are run into the oil lines to the refineries and the gas is sold to the pipe lines supplying the Southern California markets. These wells produce up to several thousand barrels of oil daily and ten to

June 28th—National War Savings Day.

twenty million feet of gas. Their installation plant stands out as an example of what can be done to eliminate waste on an operating property.

In general, a considerable advance is being made toward effective natural gas conservation over the land, both through regulation and through the sentiment of the operators.

CONSERVATION URGED

Dr. I. C. White, State Geologist of W. Virginia, said, following the reading of the Conservation report:

IN view of the enormous potential value locked up in natural gas, which none of us have ever sufficiently realized, the increasing importance of conservation of this natural product becomes more and more imperative.

I, like one flying in the wilderness down in West Virginia, have been puting forth my feeble efforts, and raising my feeble voice against this enormous waste of one of our most valuable natural products for over twenty years. It has never met with legislative approval. Not a single line has been written into the Statutes of West Virginia like there has been in Oklahoma where Mr. Diescher, connected with one of the great oil and gas companies, says that their Governmental regulations are working splendidly and that the natural gas and oil companies are satisfied with it.

Why can not we have the same Governmental regulations in Pennsylvania and West Virginia? The vast amount of gas left in these old wells is much more valuable now than it ever was before, and the wonderful by-products of which Dr. Garner of Mellen Institute of Pittsburgh has told us (See Dr. Garner's address in subsequent issue of NATURAL GAS AND GASOLINE JOURNAL) in such a way that even the layman can realize their importance, makes it all the more imperative that we should see to it that the waste in natural gas be stopped and stopped quickly. The enormous waste that has been permitted in the three States of Pennsylvania, West Virginia and Ohio must astound the ordinary gas and oil producer when brought face to face with the commercial value of the product thus wasted.

Why cannot the larger operating companies, like the South Penn Oil Company, The Manufacturers Company, The Philadelphia Company and the other larger operating companies,—why can they not inaugurate a plan like the Standard Oil Company of California has done in that field? They can afford to pay the independent operator who does not have enough gas to warrant installation,—they can afford to pay him a reasonable price for this gas that would otherwise be wasted.

The independent operators would be glad to sell it to them. Let these larger companies establish plants to take care of this waste and to utilize it.

Dr. Garner has shown us that natural gas can still be utilized with b. t. u. of over 800 to the cubic foot. It is a much better gas than can be manufactured from coal. Dr. Garner has demonstrated also the value of the by-products to be obtained from this gas, so that even the remnants may be utilized advantageously in a commercial way.

The citizens of these States would be glad to have that kind of gas for fuel which would aid materially in supplying the demand of natural gas for domestic purposes. These larger companies can well afford to put in these installations and work out these problems that Dr. Garner has been so successfully attacking.

I hope to see these great companies which are doing so much in a patriotic way, take up this question of waste in a serious manner and in a serious way and with the funds that they have at their disposal they will not only reap large returns for themselves but save and conserve one of the best natural products in the world, full of these potential possibilities and save it for themselves and for the country."

UNIFORM ACCOUNTING

BY C. S. MITCHELL, CHAIRMAN

A committee appointed on Uniform Accounting, by the Natural Gas Association of America, reported in May as follows:

WE have arranged with the Public Service Commissions of Pennsylvania, West Virginia, Ohio and New York that this classification will be submitted to them for their consideration, and have every reason to believe that within a comparatively short time we will be called into consultation with the representatives of the different commissions.

Your Committee was represented at a meeting with the Public Service Commission of Pennsylvania on the subject of uniform deposits, but as yet no rule has been issued by the Commission on this subject.

Remember! the men in our Army and Navy do not expect luxuries. Should we at home expect them? Buy necessities and War Savings Stamps.

TRAILER AUXILIARY

PRACTICING economies, yet adding to facilities and convenience at one and the same time, would seem to be in a sense not practical, and yet such is not the case in many instances. An instance of this nature has come to our attention this morning.

We are strong believers in the use of automobiles by gas companies, and have for a long period advocated this type of power and transportation facilities, versus the expensive and slow method of horse-drawn vehicles, expensive from various standpoints, and growing more expensive as wages advance, since hours required on the part of drivers and helpers do not diminish where the horse is employed.

It is nearly always the case that in the wake of a new method, piece of equipment, or form of appliance, something develops to help make the original appliance more valuable and necessary, yet at the same time to create a field for itself. This is exactly what has happened through the introduction of trailers into various fields.

We offer to the readers of THE NATURAL GAS AND GASOLINE JOURNAL, an illustration of the means whereby one of the well-known gas companies is equipped to convert a light delivery run-about into a piece of transporting-equipment large enough, and with weight-carrying capacity sufficient to convey a range, or other gas appliance such as may be used in the industrial gas field, along with pipe and fittings, needed in coupling-up the device at point of delivery. There are extensions made by several companies whereby, for instance, a Ford car may be transformed into a long delivery car. These extensions have their good points, but it must be acknowledged that when a run-about has been transformed, it is no longer available as a short car, save by a considerable amount of work necessary to reconvert it into its original length.

The trailer and the run-about accomplished in the gas industry just what the gas company needs in the way of light, quick means for delivering appliances with necessary fittings-equipment, and for use in connection with street service and emergency calls.

Our illustration shows the method of employing a trailer in appliance deliveries, and if needs be, a water-heater of large capacity, or another range for a separate delivery may be carried in the rear of the auto, in addition to that which is carried in the trailer.

Where a trailer is used in connection with an auto, there is no need for converting an auto into a long bodied car, since any service that the car with long body could perform, may be accomplished by the light delivery car, which becomes a carrying tractor or power vehicle, and its trailer.

Connected with the rear axle of the auto, is a coupling-ball, at the forward end of the steel reach extending from the trailer is a socket, this drops over the ball, and is securely coupled to it by means of a compression coupling in which a strong spring takes up the forward and backward motion of the trailer, as it passes over hummocks and through ruts, thus taking off from the trailer itself, and from the car pulling it, the shock that would come were the two pieces of equipment coupled together without a relief or shock-absorbing device.

To couple, or to uncouple the trailer to and from the car is a matter of perhaps five or six seconds. Therefore, if one so chooses, a piece of appliance like a range, for instance, with necessary fitting supplies, may be hauled to a delivery point, be uncoupled, and left at that point for the fitters to handle. It can be draw by hand through a yard or via an automobile drive-way to the kitchen door for unloading, while the motor vehicle (the automobile) is run to another point for the delivering of *its own* load of appliances intended for another job.

We must not omit to say that at each of the four corners of the trailer there is an extension leg which may be lowered, forming four legs to the trailer, thus holding it securely level, as securely as a platform, while it is being loaded and unloaded. It will be observed that these four legs being each independent of the other, will account for any irregularities in the surface of the ground when they are lowered to hold the body of the trailer secure and level.

GAS COMPANIES FIND TRAILERS INCREASE THEIR DELIVERY FACILITIES.

All you are asked to do is to buy only necessary things and then loan—not give—your savings to your Government to help it fight your war.

War Savings Stamps are the "Scraps of Paper" that will help win the war.

Constitution and By-Laws

Report of the Committee on Revision Presented at Annual Convention of the Natural Gas Association of America.

As the chairman for the committee made the following statement, and the association as a whole voted that this should be printed for the benefit of all members, we are publishing the matter in full in THE NATURAL GAS AND GASOLINE JOURNAL, that it may be spread broadcast among the members of the association, and those who should become members.—The Editor.

BY H. J. HOOVER, CHAIRMAN

THE Committee appointed last year to revise the Constitution and By-Laws of The Natural Gas Association of America begs leave to submit a number of changes in the present Constitution and also in the By-Laws.

According to the Constitution the Constitution cannot be changed until the subsequent meeting of 1919.

Article 8, Sec. 1, reads:

"Any proposition to amend this Constitution shall be submitted at a regular meeting, and secondly by a majority of all the members present; the proposition shall not be acted upon until the next regular meeting, when if approved by two-thirds of all the members who may be present at said meeting, it shall become a part of the Constitution."

The recommendation of the Committee is that the Constitution as proposed to be revised and amended, be printed some time after this meeting, submitted to all the members of the Association, to be acted upon at the next Annual Meeting.

The Chairman said:—"I think it would be much the best plan to have this report submitted to each member in printed form, so that the proposed changes may be noted, and the matter can then come up at the next meeting, at which time each member will have before him the Constitution as it is now and the amendments and revisions as proposed by the Committee.

Those portions of the Constitution as at present in effect and the same portions of the Constitution as proposed to be revised and amended as per the recommendation of the Committee are as follows:

Sec. 1 of Article 3 of the Constitution as in effect at this time:

"The membership of the Association shall consist of Honorary, Active and Junior Members, and the Junior Members shall not be entitled to vote nor hold office, but shall be entitled to all other privileges of membership."

Sec. 1 of Article 3 as amended, per recommendation of the Committee:

"Sec. 1. The membership of the Association shall consist of Honorary, Associate and Active members, and the Honorary and Associate members shall not be entitled to vote nor hold office, but shall be entitled to all other privileges of membership."

Sec. 4 of Article 3 of the Constitution as in effect at this time:

"Sec. 4. To be eligible to Junior Membership, a person must be directly or indirectly connected with the gas industry, or may be skilled therein. Junior members shall have all the privileges and courtesies of the Association, except the right to vote or hold office. Junior members may be transferred to Active Membership by a vote of the Association upon recommendation of the Board of Directors."

Sec. 4 of Article 3 as amended per recommendation of Committee:

"Sec. 4. Any corporation, firm or partnership engaged in the production, transportation or distribution of natural gas may become an associate member without voting power, upon payment of such dues as may be prescribed by the Board of Directors of the Association."

Sec. 1 and Sec. 2 of Article 4 of the Constitution as in effect at this time:

"Sec. 1. The officers of the Association shall consist of a President, Vice-President and Secretary-Treasurer, who shall be elected for one year.

Sec. 2. The Board of Directors shall consist of the President, the Vice-Preident, the Secretary-Treasurer and twelve active members of the Association, six of whom shall be elected at each annual meeting, and whose term of office shall be two years. Five members of the Board of Directors shall constitute a quorum for the transaction of business.

At the annual meeting in 1913, there shall be elected six Directors, who will serve two years, and four Directors who shall serve one year."

Sec. 1 and Sec. 2 of Article 4 as amended per recommendation of Committee:

"Sec. 1. The officers of the Association shall consist of a President, three Vice-Presidents and Secretary and Treasurer, who shall be elected for one year.

Sec. 2. The Board of Directors shall consist of the President, Vice-President and twelve active members of the Association, six of whom shall be elected at each annual meeting ,and whose terms of office shall be two years. Seven members of the Board of Directors shall constitute a quorum for the transaction of business."

Article 5, Sec. 1, Sec. 2 and Sec. 3 of the Constitution as in effect at this time:

"Sec. 1. The management of the affairs of the Association shall be intrusted to the officers and the Board of Directors, under the general direction of the members in convention.

Sec. 2. A majority of the Board shall constitute a quorum, and the Board shall have the power to fill any vacancies that may exist therein.

Sec. 3. That the Past Presidents of the Association be constituted an Advisory Committee, which, from time to time, shall give to the Association wise counsel and sound advice on matters of importance. Three members of this Committee shall constitute a quorum for the transaction of business.

The Chairman of this Committee shall be each outgoing president."

Sec. 1 and Sec. 2 of Article 5 as amended per recommendation of Committee:

"Sec. 1. The management of the affairs of the Association shall be intrusted to the officers and the Board of Directors, under the general direction of the members in convention. The Board shall have the power to fill any vacancies that may exist therein.

Sec. 2. That the Past Presidents of the Association be constituted an Advisory Committee which from time to time, shall give to the Association wise counsel and sound advice on matters of importance. Three members of this Committee shall constitute a quorum for the transaction of business.

The Chairman of this Committee shall be each outgoing president."

MR. HOOVER (continuing): The provision of the By-Laws with reference to revision or amendment now in effect being Sec. 1 and Sec. 2 of Article 13 is as follows:

"These by-laws may be altered or amended only in the following manner:

Sec. 1. Any proposition to alter or repeal an existing By-Law, shall be presented in writing during any meeting of the Association, at any time before its adjournment, seconded by not less than three members, shall be read twice, and if approved by two-thirds of all the members present, shall become a part of these By-Laws; but no such alteration or amendment shall affect any question pending at the time of its adoption.

Sec. 2. Any additional section of these By-Laws, not in conflict with existing By-Laws, may be adopted at any meeting of the Association, upon being presented in writing, duly seconded, read twice, and approved by at least two-thirds of all the members present."

There are three changes recommended in the By-Laws which the Committee submits to be acted upon at this meeting:

The first is in Art. 4, Sec. 2, with reference to the duties of the Secretary-Treasurer.

The second is in Article 6, Sec. 4, with reference to the duties of the Board of Directors in regard to the selection of a Finance Committee of three.

The third is in Article 6, Sec. 6, with reference to the Appointement of a Nominating Committee.

I will read those portions of the By-Laws as in effect at the present time and in conjunction therewith I will read the recommendations of the Committee as to the amendment and revision of those particular sections.

Sec. 2 of Article 4 of the By-Laws as in effect at this time reads as follows:

"Sec. 2. The Secretary-Treasurer shall attend all meetings of the Association and of the Board of Directors; shall have charge of the books, papers and other property of the Association and perform such other duties as may properly belong to his office."

Sec. 2 and Sec. 3 of Article 4 as amended per recommendation of the Committee reads as follows:

"Sec. 2. The Secretary shall attend all meetings of the Association and of the Board of Directors; shall have charge of the books, papers and other property of the Association and perform such other duties as may properly belong to his office and be prescribed by the Board of Directors.

"Sec. 3. The Treasurer shall attend to the collection of dues from all members, shall have the custody of the funds of the Association, and shall keep the financial books of the Association and disburse said funds in the manner prescribed by the Board of Directors."

Sec. 4 of Article 6 of the By-Laws as in effect at this time reads as follows:

"Sec. 4. Said Board shall annually, immediately after its own organization, elect a finance committee of three, from its own number who shall have power to examine at any time, the books and accounts of the Secretary-Treasurer; said committee shall also on the morning of the first day of the annual meeting, examine the report of the Secretary-Treasurer, audit his accounts, and report thereon to the Association, provided, that no officer whose accounts may be subject to examination shall under any circumstances, be a member of such examining committee. The Board of Directors, at the same meeting, shall also appoint a committee of three from its own number, whose duty it shall be to exaine and report on applications for membership."

Sec. 4 of Article 6 as amended per recommendation of the Committee reads as follows:

"Sec. 4. Said Board shall annually, immediately after its own organization, elect a finance committee of three, from its own number who shall examine the books and accounts of the Secretary and Treasurer, the report of the Secretary and Treasurer, audit the accounts, and report thereon to the Association, provided, that no officer whose accounts may be subject to examination shall under any circumstances, be a member of such examining committee. The Board of Directors, at the same meeting, shall also appoint a committee of three from its own number, whose duty it shall be to examine and report on application for membership.

After Sec. 5 of Article 6 your Committee recommends the adoption of an additional section, numbered Section 6, which reads as follows:

"Sec. 6. The Board of Directors shall at the last meeting previous to the annual convention, appoint a nominating committee of three members of the association."

In the By-Laws as in effect at this time there is no provision for appointing a Nominating Committee except by the President and it was deemed advisable to have that Committee appointed by the Board of Directors.

(*Those three amendments to the By-Laws were then adopted at the current meeting.—The Editor.*)

PRESIDENT GUFFEY: I will now entertain a motion that the Constitution as recommended to be revised and amended and the By-Laws as amended, be printed and a copy mailed to every member of the Association so that we can get the matter intelligently before you at our next Annual Meeting. Do I hear such a motion?

MR. DONALD McDONALD: I will make such a motion Mr. President.

DR. I. C. WHITE: I second the motion.

The above motion having been duly seconded was then unanimously adopted.

us to be as *exceedingly* liberal in our donations. Less, however, than otherwise need be said in this direction, for the reason that great has been the liberality of our people. Notwithstanding this, it is not out of place to say that the coming Red Cross drive should have a response more wonderful than anything that has gone before.

It should go almost without saying, that the response to the approaching bond issue should be almost limitless, and there's a reason. Every bond purchased is an investment at excellent interest, a type of *"giving"* that we should not pat ourselves on the back for. On the contrary, we should be inspired by that same element that is exhilarating in the life of the financier. In other words, we, the common people, have now actually become *the financal center,* the loaners of vast sums to our government. We have become loaners, rather than borrowers.

It is interesting to note what has been accomplished in the settling of labor troubles. The following is an official statement:

"Since we entered the war, Department of Labor has dealt with 807 labor troubles involving 1,200,000 workers and has adjusted 539 of these difficulties without interrupting work."

It is impossible to operate vast plants, and execute enormous government orders without the use of employes, and although the young men of our country have by millions been called into war service, the families of the United States and of these young men, strange to say, to a very large extent, are not suffering, and will not suffer financially on account of this condition, since the young women of the United States are becoming the earners, holding the positions that were formerly occupied by their brothers, their husbands, or their sweethearts.

As a rsult of the foregoing, the distribution of the vast wealth that is pouring into the treasury of the United States *from the people,* is being through these new channels distributed *to the families* of the nation, including the families of those who have sent their young men into service.

It would certainly appear that this is a nation not only ruled, but co-operatively financed, "of the people, for the people, and by the people."

We have gathered the following data through the courtesy of one of our very large financial institutions, and offer it as evidence of how *we, "the people," are financing our own country, so that it may buy of us, and at a profit to us,* those things that are needed by it and for its forces.

When one stops to think of it, the conditions are indeed most wonderful. Note the following facts that tell of our growth and of our prosperity as a people:

Chandler Motor Car Company of Cleveland has een awarded contract for tractors by the Government amounting to $10,000,000.

Ford tractor plant near Detroit has output of 70 tractors per day. Fifty-seven cars containing seven tractors each for export left plant recently for seaboard.

Regal Motor Car Company, Detroit, has Government contract for 300,000 three-inch shells and will erect new building at Jamestown, N. Y.

Willys-Overland Company has another Government contract for shells amounting to $10,000,000. making $50,000,000 in Government orders now on its books.

Contract has been let by the Government for a shell-loading plant near Elmwood, N. J., to cost $11,000,000, which will employ 3,000 men and women. Construction has begun.

War Department will build ordnance base in France to cost $25,000,000 and include 20 store-houses, 12 large shops and 100 small shops. The work is in progress.

Government explosives plant near Nashville, Tenn., will cost $100,000,000 instead of $60,000,000 as previously planned.

Keystone furnace of Reading Iron Company resumed after shut-down since September with output of 2,100 tons pig iron per week.

Trumbull Steel Company, Warren, Ohio, placed part of its open-hearth plant in operation early this month. Plant consists of seven 100-ton furnaces, blooming mill, sheet-bar and billet mill.

J. C. Cromwell Steel Company announces doubling capacity of its steel plant during summer months.

New tin-plate plant of Liberty Steel Company at Warren, Ohio, will start April 1st with eight mills having annual capacity of 600,000 base boxes tin-plate.

Steel Corporation is constructing gun forging plant at Gary to cost $9,000,000.

New addition to Gary coke ovens comprising 160 new ovens and costing $4,000,000 will be completed within a month, making 720 ovens for the Steel Corporation at the Gary plant.

New England Westinghouse Company has additional order for Browning machine guns exceeding $12,000,000, making total Browning guns under Government order from them totaling $130,000,000.

The $20,000,000 addition to Gary plant of Illinois Steel Company is completed and this is now the largest steel unit in the world.

Anaconda Company will construct ferro-manganese plant at Great Falls, Mont.

Monsanto Chemical Works of St. Louis purchased plant of Commercial Acid Company of East St. Louis for consideration exceeding $2,000,000.

Frick interests will spend $9,000 developing 30,000 acres coal lands, building modern town, employing 1,000 persons and having capacity over 10,000 tons of coal per day.

New Sinclair refinery at East Chicago has received first oil through 800-mile pipe line just completed. Refinery has capacity 10,000 barrels per day.

Reported Galena Signal Oil Company has bought A. S. Cullinan holdings and refinery interests for $10,000,000.

Reported Government will take over Dow Chemical Company's plants at Midland and Mt. Pleasant and use $2,000,000 for improvements to supply chemicals for munitions making.

LAUGH.

WHY live with the shades eternally pulled down? Why not open the windows of your soul, and see something worth living for—worth laughing at? Remember, the pendulum of life swings from tears to smiles; and when a fellow lives like a daily funeral, it's time to take a laugh-powder.—"The Silent Partner."

nouncements accredited to individuals, merchants, and manufacturers.

We have absolute faith in the patriotism and loyalty to the cause existing among the publications in the gas field of the United States, and while we are speaking well of the work done by the dailies, weeklies, semi-monthlies, or monthlies in other fields in the United States, we desire to emphatically speak in high terms of the purposes back of all patriotic work entered into, or conducted by the several publications in the gas fields of this country.

The following letter has been received from the American Red Cross National Headquarters at Washington. Its contents are, of course, gratifying, to ourselves as publishers. but the expressions contained in the letter we wish to convey to those who contributed the pages, for the gratitude of the Red Cross most properly should be extended to them:

THE AMERICAN RED CROSS

NATIONAL HEADQUARTERS
WASHINGTON, D. C.

June 3, 1918.

Mr. L. S. Bigelow,
President Editor,
Periodicals Publishing Company,
Buffalo, N. Y.

Dear Sir:

Mr. Davison, chairman of the War Council of the American Red Cross, has asked me to acknowledge for him, copies of the Gas Industry Magazine and the Natural Gas and Gasoline Journal containing the Red Cross advertisements, and to express at the same time our warm appreciation of your splendid attitude of helpfulness to the Red Cross.

The campaign just concluded has been a notable one, and not the least in the wonderful way in which the publishers and advertisers of the country have made it possible to get before the public the appeal of the Red Cross.

Yours very truly,

S. M. Greer,

Director Department of Development.

In no wise depreciating the services of other organizations in this time of need, yet we would say of the Red Cross, that its service rendered to the well soldier, to the sick soldier, to the injured soldier, to all soldiers in need, and as well to stricken humanity throughout the war zone, and to humanity wherever reached by extreme calamity, is without exception possibly the greatest work of a humanitarian nature extant in the world today. Furthermore, in this time of war the accounts of the Red Cross are audited by the United States Government, a means of preventing profiteering on the part of individuals or concerns who might seek this evil form of personal gain, even though the society be pure as the white of its flag, in its purposes as a society.

Every dollar, and every minute of time given to Red Cross service is a dollar and a minute invested, from which is assured vast dividends to humanity.

EXERCISING AN HOUR A DAY.

FOR the conservation of its employees' health, the newest preparedness plan was recently inaugurated in the plant of the White Company, one of Cleveland's largest industrial plants. This to build up the physical endurance of the men to a point where each man may assume added responsibility, if necessary.

The plan applies to the executive officers, superintendents, managers, heads of departments and others on whom rests responsibilty of solving important manufacturing and selling problems.

The new plan has been in effect since November and the men holding responsible positions it is intended shall take vigorous physical exercise daily, under the direction of a trained instructor, spending an hour each afternoon in the spacious new gymnasium.

Many large manufacturing concerns have in times past erected pretentious gymnasiums for the optional use of their employes outside of regular business hours, but this is the first movement of this nature whereby to enforce improved health conditions among employes, thus to make them more efficient in the present crisis.

Those male employes who are enrolled in the different classes, are paid by the company for the time they spend in the "gym," these men being compelled under penalty of a fine to report at the gymnasium at a specified time and are not permitted to leave until the class is dismissed.

For some time various of President Wilson's Cabinet have been taking regular exercise daily under the personal direction of Walter Camp and their program is along the same lines as that in effect at the big White plant.

The Government realizes the great benefit to be derived from regular exercise and is recommending that all manufacturing and industrial plants set aside fifteen minutes a day to be devoted to breathing exercises and light calisthenics.

The American soldiers abroad spend several hours a day in athletic games and troops landing in France are immediately marched to an athletic field, where they participate in inter-regimental games. This exercise limbers up their muscles after the long journey on the transports.

The results of the training, so for, have been gratifying to both the company and the men. The plan may, later, be extended to include all of the five thousand or more bookkeepers, clerks, accountants, salesmen, stenographers, skilled and unskilled workmen in the plant.

TRAINED INSTRUCTOR IN CHARGE

ie "gym" instruction is conducted by W. E. Rice, rienced athletic coach and director, a graduate of Chicago Training School and prominent in Y. M. circles all over the country.

e course Mr. Rice has outlined for the busy fac- workers consists of passing the medicine ball, ng-up exercises, stall bar work, hand ball, wrest- club swinging, bag punching and many other s of calisthenics. Following a strenuous work- in the "gym" the men jump under a battery of er baths.

his health. In many cases a change of diet and the eating of plainer foods that give greater nourishment have helped materially to remedy ailments.

E. W. Hulet, vice-president of the White company, who fathered the adoption of this "preparedness" idea, is highly pleased with the results which have been obtained. He declares that among other things it has set up a new social equality between the officers of the company and its department managers.

In speaking of a closer relationship between the company and its managers, Mr. Hulet states: "A gymnasium is one of the most democratic institutions

TWO CLASSES AT WORK IN THE WHITE COMPANY'S "GYM".

fore entering the class all men are required to rgo a rigid examination by the company's med- examiner. The doctor makes out a comprehen- report of his findings and this is filed in the super- dent's office. The examination is repeated regu- every month and compared with the original re- The records are carefully kept and are as ac- e as it is possible to make them.

edical attention is given any man found to be ss, underweight and suffering with some minor ide. The physician and physical director give him e as to the proper course to pursue to improve

in the world. It is a place where men meet on an equal basis and get to know each other more intimately. They are dressed alike, do the same stunts and forget their business cares. It gives them new enthusiasm and better spirits. We feel now that we couldn't get along without it."

One of the superintendents, who is 36 years old, and weighs 216 pounds, after attending class regularly for a period of ten weeks, is now able to take the regular work assigned to any of the other members and has reduced his weight seven and a half pounds and his waist measurement one and a half inches.

The concessions of the weak are the concessions of fear.—Burke.

His chest expansion has increased two inches; right arm, one inch; left arm, half an inch; left and right leg, each two inches. His health was never better, and he is now losing from three-quarters to one pound a day.

It's a fact that while fat men lose weight under this strenuous daily exercise, the thin and underweight men gain. A foreman, 47 years old, who tipped the scales at 122 pounds when he enrolled in the class, is now five and one-half pounds heavier. Many of his other measurements have increased from one to three inches and he says that he is getting stronger every day.

Three other members of the class were reticent about taking up the work. One was recovering from a prolonged illness, while the other two suffered with indigestion and stomach trouble. The first gained

Waist	—1½ in.	— ½ in.	—1 in.
Right Leg	+2 in.	+ ½ in.	+ ½ in.
Left Leg	+2 in.	+ ½ in.	+ ½ in.
	Age 32	Age 39	Age 48
Weight (before)	185 lbs.	167 lbs.	135 lbs.
Weight (after)	—5 lbs.	—10 lbs.	Same
Neck	+ ½ in.	+ ¾ in.	+ ¼ in.
Chest Nor.	+4 in.	—1 in.	—1 in.
Chest Con.	Same	—1 in.	+ ½ in.
Chest Exp.	+1½ in.	+ ½ in.	+ ½ in.
Right Arm	+1 in.	Same	+ ½ in.
Left Arm	+ ¾ in.	Same	+ ½ in.
Waist	—1 in.	—2 in.	—1 in.
Right Leg	+1½ in.	+ ½ in.	Same
Left Leg	+1½ in.	+ ½ in.	Same

ONE HOUR OF THIS EACH DAY PAYS BIG DIVIDENDS IN PERSONAL EFFICIENCY.

thirteen pounds in weight, the second seven and a half pounds and the third two pouds. All say that their health is much improved.

Some men who complained of having too large a waist measurement and protruding stomachs have been able to reduce them as much as two and three-quarter inches and expect to take off a few more inches within the next few weeks.

The following interesting table, compiled from a few members of the class, shows relative gains and losses of men, ranging from 32 to 48 years, and all have been in the employment of The White Company from ten to thirty years:

GYMNASIUM RECORD.

	Age 36	Age 42	Age 46
Weight (before)	216 lbs.	142 lbs.	163 lbs.
Weight (after)	—7½ lbs.	—5 lbs.	—6 lbs.
Neck	Same	+ ½ in.	Same
Chest Nor.	Same	+2 in.	+1 in.
Chest Con.	Same	Same	Same
Chest Exp.	+2 in.	+1 in.	Same
Right Arm	+1 in.	Same	+ ½ in.
Left Arm	+ ½ in.	Same	+ ½ in.

Already many other large industrial and manufacturing concerns have investigated the plan with the idea of adopting it for their own business.

Buy War Savings Stamps to the utmost of your financial capacity, and then increase you capacity by saving more.

SAILING LAKE ERIE

The opening trip of the magnificent steamers plying Lake Erie between Buffalo and Cleveland took place on May 1st, and from that date on through the season the steamers will leave Buffalo at 8:00 P. M. each evening, standard central time, arriving in Cleveland 7:00 A. M. The reverse trip Cleveland to Buffalo is made each day, boat leaving Cleveland at 8:00 P. M., standard central time, arriving in Buffalo at 6:30 A. M. Fare one way $3.52, round trip $6.02. A special automobile rate for tourists is made as follows: $7.50 round trip for automobile not exceeding 127 inches wheel base. Return limit two days.

The success of any great enterprise does not depend upon numbers.—Garrison.

RESULTS OF DRILLING---LATEST REPORTS

PENNSYLVANIA FIELDS.

BRADFORD FIELD.

J. T. Jones, W. P. Burton 1	Dry

MIDDLE FIELD.

Lot 3190, Dr. Kitchen 1	Dry
Lot 373, Pennsylvania Oil 597	Gas
Schriner, Continental Oil 4	Dry
Jackson, Carnahan & Co. 1	Dry
Shanley, Natural Gasoline 21	Dry
McKean, Haskell & Co. 18	Gas
Isenbrown, Proper & Co. 3	Dry
Siggins, J. B. Siggins 11	Gas
Wallace, Clinger Oil 5	Dry
Wallace, Clinger Oil 6	Dry
Joclyn, Proper et al. 15	Dry
Dry	8
Gas	3

VENANGO-CLARION.

Evans, Davis, Glenn et al. 2	Dry
Moore, Krug & Co. 1	Dry
Foster, A. T. Foster 28	Dry
Stein, S. P. McCalmont est. 5	Gas
Henry, United Natural Gas 2	Gas
Clarion County—	
Stumpner, Stumpner, Shorts, Kapp 15	Gas
Buzza, J. N. Buzza et al. 5	Gas
Shipps, Shorts et al. 2	Dry
Reed, Keatley, Reed & Co. 1	Dry
Furnace Co., Furnace Co. 2	Gas
Dry	5
Gas	5

BUTLER-ARMSTRONG.

Young, W. G. Daughtery 1	Dry
Barkley, Humphrey & Lockwood 1	Dry
Kneise hrs., Henry & Co. 1	Dry
Campbell, Heist et al. 1	Dry
Dry	4

SOUTHWEST PENNSYLVANIA.

Washington—	
Kerr hrs., Manufacturers L. & H. 1	Dry
Imperial—	
Deemer, Manufacturers L. & H. 1	Dry
Briceland hrs., Watson & Co. 2	Dry
Dorseyville—	
Johnston, Schlagel & Freid 2	Gas
Peel, Peel & Co. 1	Dry
Duff City—	
Neely, Neely Bros. & Harbison 1	Gas
Thman, Harbison & Co. 1	Gas
Bellevue—	
Millford, Steir & Co. 2	Dry
Swan hrs., Nock & Co. 2	Dry
Beaver County—	
Connell, S. S. Ferguson & Co. 3	Dry
Buchannan, Tope, Coulter & Co. 6	Dry
Milltown—	
Barnett, Peoples Gas 1	Gas
Mt. Morris—	
Tennant, Peoples Gas 1	Gas
Dry	8
Gas	5

WEST VIRGINIA.

Mannington—	
Gump, South Penn Oil 3	Gas
Barnett, Hope Gas 1	Gas
Starcher, South Penn Oil 3	Gas
Smith, Carnegie Gas 2	Dry
Maxwell, Philadelphia Co. 4	Gas
Kincaid, Blackshere Oil & Gas 1	Gas
Brannon, Carnegie Gas 1	Gas
Kendall, Hope Gas 1	Gas
Furbee, Manufacturers L. & H. 1	Dry
McCullough, Carnegie Gas 2	Gas
Rutter, Manufacturers L. & H. 1	Dry
Haught, Hope Gas 5	Gas
Lemley, Hope Gas 2	Gas
Wetzel and Tyler—	
Sole, Carnegie Gas 2	Gas
Horher, Carnegie Gas 1	Gas
Brast, Hope Gas 2	Gas
Wayne, Hope Gas 1	Gas
Carlin, South Penn Oil 5	Gas
Marshall County—	
Miller, Manufacturers L. & H. 1	Gas
Buzzard, Manufacturers L. & H. 1	Gas
Miller, J. C. Nevlin & Co. 1	Dry
Brooke County—	
Mozingo, Horse Shoe Oil & Gas 1	Gas
Revora, Revora & Co. 1	Dry
Ritchie County—	
Newbrough, Carter Oil 2	Dry
Hardman, Hope Gas 1	Dry
Wilson, Hope Gas 1	Dry
Hurst, Hope Gas 1	Gas
Taylor, Philadelphia Co. 4	Dry
Freeman hrs., Carter Oil 1	Dry
Brannon, South Penn Oil 1	Gas
Spurgeon, Philadelphia Co. 1	Dry
Lemon, O. V. O. & G. 1	Gas
Wirt County—	
Rathbone tract, Roberts Bros. 110	Dry
Swisher, Roberts Oil 14	Dry
Pleasants County—	
Tate, Tate Farm Oil 3	Dry
Ward, Ward Oil 1	Dry
Morgan, Smith & McCullough 1	Dry
Ditson, Walnut Run Oil 1	Dry
Kanawha County—	
Williams Coal, Ohio Cities Gas 100	Gas
Williams Coal, Ohio Cities Gas 148	Dry
Spruce, G. L. Cabot 1	Gas
Cabell County—	
Kilgore, Harsbarger Oil & Gas 5	Dry
Dry	19
Gas	23

To bear is to conquer our fate.—Campbell.

SOUTHEASTERN OHIO.

Woodsfield—	
McBroom, Cooper & Young 1	Dry
Ulrich, Vandergrift & Co., 1	Dry
Thomas, J. L. Kakland & Co. 1	Dry
Perry County—	
Newman, Ohio Cities Gas 1	Dry
Denman & Son, Kellar, Marshall & Co. 3	Dry
Rodgers Bros., Ruth & Strong 15	Dry
Weaver, Thos. O'Connor & Co. 26	Dry
Meenen, Clark Oil & Gas 2	Dry
Studer, Cherokee Oil 2	Dry
Hocking County—	
Hammond, Preston Oil 1	Dry
Loomis, United Fuel Prod. 1	Dry
Bratt, Preston Oil 3	Dry
Mowery, McConnell Oil 3	Dry
Cable, Preston Oil 1	Dry
Athens County—	
Reuter, Meyer Oil & Gas 10	Dry
Morgan County—	
P. H. Building Co., Sunday Creek Coal 4	Dry
E. R. Dale, H. E. Smith 231	Dry
Noble County—	
Hill, J. T. Watson & Co. 2	Dry
Shafer, H. H. Mosley & Co. 6	Dry
Nau, Brady Dixon & Co. 1	Dry
Marietta—	
Hays, Tait Bros. & Co. 5	Dry
Hall, L. J. Torner & Co. 27	Dry
Plumley, Cambrina Oil & Gas 4	Dry
Breckenridge, J. C. Dinsmoor 17	Dry
Schulteise, Lauck & Co. 1	Dry
Templeton, J. H. Kiggins & Co. 1	Dry
Brown, James Imel 4	Dry
Deucher-Bliss, W. Tornily & Co. 12	Dry
Montgomery, Bell Oil & Gas 1	Dry
Phillips, Central National Bank 1	Dry
Felter, G. L. Watson & Co., 3	Dry
Decker, J. B. Braden Oil 4	Dry
Hadley, E. A. Ryan 4	Dry
Felter, Watson & Co. 2	Dry
Harrison County—	
Henderson, Surprise Oil 2	Dry
Kerby, Thomas Moon 1	Dry
Smith, Petroleum Oil & Gas 2	Dry
Columbiana County—	
Stanley, J. C. Nevin & Co. 1	Dry
Fryfogle, N. G. Co. of W. Va. 1	Dry
Belmont County—	
Ramsey, N. G. Co. of W. Va. 1	Gas
Perkins, Minnie M. Borchers 9	Gas
Dry	39
Gas	2

PENNSYLVANIA FIELDS.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry	Gas
Allegany	15	49	0	0
Bradford	38	125	1	0
Middle Field	26	25	8	2
Venango-Clarion	47	64	5	5
Butler-Armstrong	14	19	4	0
S. W. Penna.	27	208	8	5
West Virginia	107	691	17	22
S. E. Ohio	108	1,002	39	2
Total	382	2,183	82	36

CENTRAL OHIO.

LICKING COUNTY.

Licking—Gourley, Heisey Gas 2	Dry
Liberty—D. C. Brooks, Heisey Gas 1	Gas
Dry	1
Gas	1

FAIRFIELD COUNTY.

Berne—M. Killbarger, City Nat. Gas 1	Gas

KNOX COUNTY.

Pike—A. J. Pealer, Upham Gas	Dry

ASHLAND COUNTY.

Sullivan—J. Spencer, Ohio Fuel S. 1	Dry

MEDINA COUNTY.

Brunswick—Carpenter, Ohio Fuel Sup. 1	Gas
Medina—Nichols, Medina Gas & Fuel 1	Dry
Lafayette—Schock, Ohio Fuel Sup. 1	Gas
J. A. Clark, Ohio Fuel Supply 2	Gas
Infirmary, Logan Gas & Fuel 2	Gas
Dry	1
Gas	4

WAYNE COUNTY.

Cannan—F. S. & N. Gast, Logan G. & F. 1	Gas
G. E. Haley, Ohio Fuel Supply 1	Gas
Wayne—Johnson, Ohio Fuel Supply 1	Dry
Clinton—D. O. Welty, East Ohio Gas 2	Dry
E. Aylesworth, East Ohio Gas 1	Gas
A. E. Vrooman, East Ohio Gas 4	Gas
Dry	2
Gas	4

RICHLAND COUNTY.

Monroe—Irvine, Logan Gas & Fuel 1	Gas
Sam Andrews, Ohio Fuel Supply 2	Gas
Gas	2

CUYAHOGA COUNTY.

Dover—A. & M. Wolfe, Logan G. & F. 1	Gas
Alice C. Beam, Preston Oil 1	Gas
E. S. Lewis, Melrose Oil & Gas 1	Gas
C. Mallie, East Ohio Gas 1	Gas
R. Meyer, East Ohio Gas 1	Gas
Ezra Tuttle, East Ohio Gas 2	Dry
E. Champ, East Ohio Gas 1	Dry
Dry	2
Gas	5

VINTON COUNTY.

Richland—Cassill, Ohio Fuel Supply 1	Gas
Jackson—Sadie Hays, Ohio Fuel Supply 1	Gas
Gas	2

PERRY COUNTY.

Thorn—Chas. Boring, Ohio Fuel Sup. 1	Gas
Anna Rarick, Ohio Fuel Supply 1	Gas
Nancy J. Lynn, Logan Gas & Fuel 2	Gas
Gas	3

HOCKING COUNTY.

Salt Creek—Eli Stevens, Logan G. & F. 1	Dry
Dan Karshner, Ohio Fuel Supply 2	Gas
Dry	1
Gas	1

The world is a comedy to those that think, a tragedy to those who feel.—Walpole.

HOLMES COUNTY.

Washington—S. Fulmer, Logan G. & F. 1..... Gas

CENTRAL OHIO FIELDS.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry	Gas
Licking	2	0	1	1
Fairfield	1	0	0	1
Knox	1	0	1	0
Ashland	1	0	1	0
Medina	5	0	1	4
Lorain	0	0	0	0
Wayne	6	0	2	
Richland	2	0	0	2
Cuyahoga	7	0	2	5
Vinton	2	0	0	2
Perry	3	0	0	3
Hocking	2	0	1	1
Holmes	2	20	0	1
Coshocton	1	70	0	0
Jackson	0	0	0	0
Total	35	90	9	24

LIMA FIELD.

WOOD COUNTY.

Liberty—Jno. Johnson, Ohio Oil 32 ..... Dry

DEFIANCE COUNTY.

Bryan—H. Newcomer, Whitesides & Co. 1..... Dry

INDIANA FIELD.

WELLS COUNTY.

Nottingham—J. O'Dell, McCrary Bros. 2..... Dry

JAY COUNTY.

Penn—S. E. Davis, Jones & Lyons 8 ..... Dry

GIBSON COUNTY.

Washington—Zimmerman, Indian Refg. 1 ..... Gas
Thos. Duncan, Ohio Oil 1 ..... Gas

Gas 2

PIKE COUNTY.

Madison—G. M. Reed, M. Murphy est. 3 ..... Dry

SULLIVAN COUNTY.

Gill—W. F. Bates, E. R. Riggs 8 ..... Dry
W. H. Hoseman, E. R. Riggs 3 ..... Dry

Dry 2

INDIANA FIELD.

SUMMARY OF COMPLETED WORK.

	April, '18			March, '18		
	Comp.	Prod.	Dry	Comp.	Prod.	Dry
Wells	1	0	1	0	0	0
Blackford	0	0	0	1	0	1
Jay	3	85	1	3	20	1
Delaware	0	0	0	4	145	0
Randolph	0	0	0	3	60	1
Gibson	3	20	2	2	75	1
Pike	7	295	1	6	135	1
Sullivan	4	6	2	8	34	5
Total	18	406	7	27	469	10

KENTUCKY-TENNESSEE.

WAYNE COUNTY.

Cooper—H. C. Coffey, O. M. Carter 10..... Dry
Steubenville—Jno. Burnett, Wood Oil 16..... Dry

Dry 2

LAWRENCE COUNTY.

Busseyville—H. Carter, Ohio Fuel Oil 2..... Dry

ESTILL COUNTY.

Irvine—W. M. Truitt, Ohio Oil 3..... Dry
J. L. Ross, Empire Oil & Gas 10..... Dry
Banks Tipton, F. H. Yates 1..... Dry
L. Young, Empire Oil & Gas 7 ..... Dry

Dry 4

POWELL COUNTY.

Pilot—I. T. Rogers, Ohio Oil 6..... Dry
J. Bishop, Ajax Oil 1..... Dry
P. Y. Drake, Unknown 1 ..... Dry
W. Townsend, Cumberland Pet. 5 ..... Dry
John McCoy, Wood Oil 3..... Dry
Elijah Baker, Cherokee Oil 17 ..... Dry
Wince Friend, New York-Irvine Oil 1 ..... Dry

Dry 7

LEE COUNTY.

Beattyville—Jno. Kincaid, Stanton Oil 3 ..... Dry
Eureka, Southwest Oil 3 ..... Dry
Eureka, Southwest Oil 4 ..... Dry
Thos. Burkhart, Carter Oil 2 ..... Dry

Dry 4

ALLEN COUNTY.

Scottsville—Lester Charton, Walmer Oil 1..... Dry
Mayme Johnson, State Line O. & G. 2..... Gas
Dott Oliver, Snowden Bros. 2..... Dry
B. A. Downing, Phinney & Co. 2..... Dry
Slate, Phinney & Co. 1..... Dry
J. Wainscott, J. L. McMahon & Co. 1..... Dry
Geo. Tucker, J. W. Cashdollar 1 ..... Dry

Dry 6
Gas 1

ROCKCASTLE COUNTY.

Broadhead—Owens-Norton, Atlantic Oil & Prod. 1. Dry

KNOX COUNTY.

Barbourville—Morris, New York Dev. 1..... Dry

PULASKI COUNTY.

Somerset—White Oak, P. J. White 1 ..... Gas

BREATHITT COUNTY.

Copes Branch—Buck Crawford, Atlantic O. & P. 2.. Dry

LOGAN COUNTY.

Russellville—Edward, Big Dome Oil 1..... Dry

SUMNER COUNTY.

Gallatine—Widow Carter, Judge Kies 1 ..... Gas

KENTUCKY-TENNESSEE.

COMPLETED WORK.

	Comp.	Prod.	Dry	Gas
Wayne	5	45	2	0
Wolfe	8	96	0	0
Lawrence	4	14	1	0
Morgan	1	10	0	0

He that wrestles with us strengthens our nerves and sharpens our skill. Our antagonist is our helper.—Burke.

Estill	36	427	4	0
Powell	41	445	7	0
Lee	34	755	4	0
Allen	21	240	6	1
Barren	5	25	0	0
Floyd	1	5	0	0
Lincoln	10	50	0	0
Rockcastle	1	0	1	0
Knox	1	0	1	0
Pulaski	1	0	0	1
Owsley	1	5	0	0
Breathitt	5	15	1	0
Logan	1	0	1	0
Tennessee	4	90	0	1
Total	180	2,222	28	3

ILLINOIS FIELD.

CLARK COUNTY.

Parker—Otis Elliott, J. I. Campbell & Co. 7..... Dry

CRAWFORD COUNTY.

Oblong—Job Randolph, H. C. Ferriman & Co. 3..... Dry
Licking—Carolina Wilkin, W. C. Kennedy Co. 1..... Dry
Montgomery—Lake Dances, Kentucky Petroleum 2 Dry
Honey Creek—Jones, Craig & Lowrie 7..... Dry
W. A. F. H. Hope, Lease Oil 8 ..... Gas

Dry 4
Gas 1

LAWRENCE COUNTY.

Dennison—Thos. Perkins, Smith & Leighty 1 ..... Dry
W. Dennison, Central Refg. 2 ..... Dry

Dry 2

CLINTON COUNTY.

Irishtown—Geo. Kandis, Ewing & Spurgeon 1..... Dry

WABASH COUNTY.

Wabash—Jac. Smith, Sian Oil & Gas 13..... Dry
Friendsville—Toney, Midland O. & G. 3..... Dry
O. Matheney, Central Refg. 2..... Dry

Dry 3

ILLINOIS FIELD.

SUMMARY OF COMPLETED WORK.

	April, '18			March, '18		
	Comp.	Prod.	Dry	Comp.	Prod.	Dry
Clark	7	72	1	4	17	0
Crawford	18	84	5	12	108	4
Lawrence	7	216	2	4	170	1
Clinton	2	3	1	0	0	0
Marion	0	0	0	1	0	1
Wabash	3	0	3	3	0	3
Jasper	0	0	0	1	2	0
Edgar	0	0	0	1	1	0
McDonough	1	3	0	1	10	0
Total	38	378	12	27	308	9

KANSAS.

BUTLER COUNTY.

26-26-4, Buscher, Grifman Oil 1 ..... Dry
7-29-4, Ruthford, Mid-Kansas O. & G. 3 ..... Dry
8-29-4, Ruthford, Mid-Kansas O. & G. 6..... Gas
9-29-4, Harter, Mid-Kansas O. & G. 3..... Dry
9-29-4, Harter, Mid-Kansas O. & G. 5..... Dry
9-29-4, Harter, Mid-Kansas O. & G. 6..... Dry
14-29-3, Hoyt, Lucky Eight Oil 2 ..... Gas
26-26-4, Buffman, Manley & Griffith 1 ..... Dry
1-28-5, Tague, Central O. & G. 2..... Dry
25-26-5, Sluss, Big Chief Oil 1 ..... Dry
27-24-5, Colvin, Phillips et al. 1..... Dry
8-25-4, Munson, P. O. & G. 1..... Dry
36-25-4, Houston, Empire G. & F. 25..... Dry
27-27-5, Wilson, Carter Oil 18 ..... Dry
6-26-4, Braley, Texokla Oil 1 ..... Dry
18-26-4, Mosier, P. O. & G. 1..... Dry
26-26-5, Sluss, Skelly et al. 2 ..... Dry
9-26-4, Zink, Peters O. & G. 1..... Dry
1-27-5, Smock, Carter Oil 1 ..... Dry
9-23-3, Regier, Big Mogul Oil 1 ..... Dry
15-25-4, Bradford, Wyoming-Montana 1..... Dry
18-23-4, Loydig, Dedrick et al. 1..... Dry
1-26-4, Ralston, Empire G. & F. 1..... Gas
25-25-4, Houston, Empire G. & F. 38..... Dry
29-25-5, Stapleton, Empire G. & F. 22 ..... Gas
26-25-4, Harden, Empire G. & F. 1..... Dry
3-25-5, Robinson, Theta Oil 15 ..... Dry
29-26-5, Kinney, Leonard Oil 2..... Dry
11-27-5, Marshall, Haverhill Petroleum 3 ..... Dry

Gas 4
Dry 25
Gas 7,000,000

MIAMI-FRANKLIN AND DOUGLAS COUNTIES.

12-16-21, Mallory, J. E. Mallory 1 ..... Dry
12-16-21, Tullos, Benton O. & G. 4..... Dry
23-16-21, Boozem, unknown owner 2..... Dry
12-17-22, Hogan, Harley et al. 1..... Dry
21-17-22, Crees, Dr. I. N. Miller 5 ..... Dry
20-17-23, Kelly, unknown parties 1 ..... Dry
17-17-23, Wilgers, unknown parties 1 ..... Dry
35-17-22, Stockwell, Greystone O. & G. 1..... Dry
13-16-21, Mallory, Jackson O. & G. 3 ..... Gas
16-21-21, Chitton, Victor O. & G. 1..... Dry
32-16-21, Tullos, Benton O. & G. 5..... Dry
13-16-21, Weingart, Russell Strand et al. 2..... Dry
28-17-22, Roberts, Grand Central Oil 1..... Dry
28-17-22, Roberts, Grand Central Oil 2 ..... Dry
20-16-21, Thompson, Sentinel O. & G. 4..... Dry
10-16-21, Bradford Flo Jean Oil 5 ..... Gas
13-16-20, Mallory, Mallory 1 ..... Gas
19-17-23, Hogan, Root Pennman Co. 20 ..... Dry
21-17-22, Crees, Dr. I. N. Miller 6 ..... Dry
29-16-21, Gingrich, Alflomo Oil 1 ..... Dry
10-16-21, Bauman, Choctaw & Chickasha 5 ..... Dry

Gas 3
Dry 18
Gas 1,750,000

CHAUTAUQUA AND ELK COUNTIES.

26-31-12, Jones, Railroaders Oil 1..... Dry
20-13-12, Dexter, Bliss & Co. 5..... Gas
34-31-12, Guthrie, West & Hazlett 3 ..... Dry
22-33-10, Hopkins, C. E. Roth et al. 2..... Dry
26-32-14, Hendricks, Dover Oil 2..... Dry
31-32-13, Seybold, Sachem Oil 1 ..... Gas
24-31-12, Deeskill, Conley & Bowson 1..... Dry
24-32-12, Fee, Mary Holliday ..... Dry
North of Longton, Brooker Bros. 1..... Dry
16-31-12, Freeman, Statti et al. 1..... Dry
31-32-13, Seybold, Sachem Oil 4 ..... Gas
24-31-12, Nelson, Ashley et al. 2 ..... Dry
36-33-12, McAfee, Denver parties 1 ..... Dry
27-33-10, Moffit, C. E. Roth 4 ..... Dry

Gas 3
Dry 11
Gas 4,000,000

It is not enough to do good; one must do it the right way.—Morley.

NEOSHO COUNTY

	Thornton Tulsa owners	Gas
	Gibson J H Evans et al	Dry
	Campbell Maryland Oil	Dry
	Dewall J S Cambern	Dry
	Burghardt Moore Bros & Fox	Dry
	Van Lamingham Moore et al	Dry
	Dolan Unknown owner	Dry
	Van Lamingham J W Moore et al	Dry
	Rosenberry Bell et al	Dry
	Johnson et al Riverside Oil & Gas Co	Dry
	Haynes J W Moore et al	Dry
		—

ALLEN COUNTY

	Diamond Devore & Cooper	Dry
	Xenia Center Blk of Tulsa	Dry
	Miller Midvale Oil & Gas	Dry
	Campbell [illegible] & Co	Gas
	Sauer Liberal Oil & Gas	Dry
	Roger Devore & [illegible]	Dry
		—

WILSON COUNTY

	Hilbert J B Jamison	Dry
	Shubert J B Jamison	Dry
	Powell Verdigris Oil	Dry
	Street [illegible]	Dry
	Driggers [illegible]	Dry
	Peters Oil & Gas	Gas
	Twin Sands	Dry
	Kelsey Arkalon	Dry

MONTGOMERY COUNTY

	Robertson [illegible]	Dry
	Perryman Inv Co	Dry
	Metcalfe W W [illegible]	Dry
	Dan Jesse [illegible]	Dry
	Joe Minnes [illegible]	Dry
	Paul Moore [illegible]	Dry
	C F Rose [illegible]	Dry
	Bob Scott & [illegible]	Dry
	Swinehaugh [illegible]	Dry
	Kuntz Oil Development	Dry
	Young Rose & [illegible]	Dry

WILDCATS

	Todd Derby & Marshall	Dry
	Armstrong Parker [illegible]	Dry
	Burt J A Hechtenberger	Dry
	Norris Farmers [illegible]	Dry
	Sloan Cowden [illegible]	Dry
	Rose Oil & Gas	Dry
	Coleman D O A	Dry
	Clark Benedum & [illegible]	Dry
	Dale City Stat[illegible]	[illegible]

McPherson County

	Dale, Montana Wyo	Dry

Greenwood County

	Douglass United Oil	Gas

Sumner County

	[illegible], Locke et al	Dry

Woodson County

	Hatfield et al	Dry
	Sperry Oil & Gas	Gas

Greenwood County

	[illegible] Hatfield & Teeters	Dry
	Lampe Lampe Oil & Gas	Dry
	Breden Mid Kansas Oil & Co	Dry
	Claycomb Pennant Oil & Co	Dry
	Hall Standish Oil	Dry

Geary County

	Eastern Geary Oil	Dry

Morris County

	[illegible] Oil	Dry
	General Petroleum	Dry
	Empire Gas & Fuel	Dry
	Richardson et al	Dry

McPherson County

	W. Dale, Illinois Oil	Dry
		—
	Gas	3
	Dry	23
	Gas	[illegible]

OKLAHOMA

OSAGE COUNTY

	[illegible]	Gas
	[illegible]	Dry
	[illegible]	Dry
	[illegible]	Dry
	[illegible]	Dry
	[illegible]	Gas
	[illegible]	Dry
	[illegible]	Dry
	[illegible]	Dry
	[illegible]	Gas
	[illegible]	Dry
	[illegible]	Dry
	[illegible]	Gas
	[illegible]	Gas
	[illegible]	Gas
	[illegible]	Gas
	[illegible]	Gas
	[illegible]	Dry
	[illegible]	Dry
	[illegible]	Gas
	[illegible]	Dry
	[illegible]	Gas
	[illegible]	Dry
	[illegible]	Dry
	[illegible]	Gas
	[illegible]	Gas
	Newman	Dry
		19
		19
		[illegible]

WASHINGTON COUNTY

	[illegible]	
	[illegible]	Dry
	[illegible]	Dry
	[illegible]	[illegible]

There is no wisdom like frankness Disraeli

33-29-14, Lacey, E. V. Crowell 1 ..... Gas
32-28-13, Sheets, J. C. Sheets ..... Dry
36-29-13, Gordon, Caney Gas ..... Gas
17-26-13, Wilson, Mid-Co. Gasoline Co. 2..... Gas
16-26-12, Lot 38, Interstate Oil & Gas 27 ..... Dry
9-26-12, Lot 35, Kinsley Oil & Gas 52 ..... Dry
9-28-13, Hanks, Queen Oil & Refg. 3 ..... Dry
18-28-14, Davis, Copan Oil 1 ..... Dry
36-28-14, Fee, Tidal Oil 34 ..... Dry

Gas 4
Dry 8
Gas 500,000

NOWATA AND NORTHERN ROGERS COUNTIES.

Cherokee Shallow—
11-24-17, Palmour, Rex Oil 2 ..... Dry
26-24-16, Douglas, Gibraltar Oil 2..... Dry
15-24-16, Rowsey, Gt. Southwestern Oil 5 ..... Dry
35-25-16, Greer, Big 500 Oil 1..... Dry
10-25-16, Brummon, Spring Oil 12 ..... Dry
29-27-16, Wills, Strike Oil Syndicate 1 ..... Dry
11-24-17, Chelsea Oil 3 ..... Dry
18-24-17, McAllester's 7 ..... Dry
8-24-17, Optimo Oil & Gas 5 ..... Dry
8-24-17, Optimo Oil & Gas 6 ..... Dry
4-25-17, Midland Oil & Drilling 7 ..... Dry
6-26-16, Ballard, Nickle & Cook 1 ..... Dry

Dry 12

TULSA COUNTY.

Bird Creek and Skiatook—
5-21-13, Hitchie, Bergen Oil & Gas ..... Dry
20-20-13, Donahoe, Lewis et al. 2..... Dry
19-20-13, Kinneson, Texas Co. 1 ..... Dry
36-22-13, Justice, Tulsa Fuel 1 ..... Gas
21-20-13, Johnson, Liberty Oil 12 ..... Dry
19-20-13, Lloyd, Texas Co. 1 ..... Dry
36-23-13, Foreman, Tulsa Fuel 1 ..... Dry

Red Fork—
9-19-11, Barnett, Charles Page 2 ..... Gas
29-19-11, Leader, Irelan & Smith 1..... Gas
29-19-12, Wright Producing Co. ..... Dry
20-19-11, Postoak, U. S. Oil 14 ..... Dry
8-19-11, Island, C. Page 1 ..... Gas
21-19-12, Perryman, U. S. Oil 3 ..... Dry
34-19-12, Templin, Gladys Belle Oil 1 ..... Dry
29-19-11, Flat, Billinglea et al. 1..... Dry

Broken Arrow—
11-19-13, Morgan, H. F. Wilcox et al. ..... Dry
23-19-13, Fields, Gallagher et al. 1..... Dry
13-18-14, Barnett, Bearman et al. 2..... Dry
25-18-14, Scott, Bearman et al. 7..... Dry
33-18-14, Colbert, Brown & McFann 1 ..... Dry
34-18-14, Perryman, Edgar Oil 1 ..... Dry
35-18-14, Childers, Lampton et al. 3..... Dry
33-18-14, Smith, Franklin et al. 1..... Dry
29-18-15, McHenry, Okla. Queen Oil 1 ..... Gas
29-19-14, Tucker, Thompson et al. ..... Dry
30-18-13, Perryman, Brady et al. 9..... Dry
17-18-15, Kernee, Thompson et al. 1..... Dry
24-18-14, Beaver, Varner et al. 1..... Dry
5-18-13, Fields, Tucker et al. 2..... Dry

Bixby—
23-16-13, Big Pond Tidal Oil 2 ..... Dry
27-17-13, Mings, Humble Oil 4 ..... Gas
28-16-13, Puryear, Ardizzone & Braden 2 ..... Gas
19-18-13, Kirnie, Cosden & Rogers 1 ..... Dry
14-17-13, Beggs, Davis & Younger 2 ..... Gas
29-16-13, Big Pond, W. M. Cole et al. 1..... Dry
25-16-14, Grayson, Carter Oil 1 ..... Dry
6-16-13, Murray, Eastern Oil 2 ..... Dry
23-17-14, Wilcox, H. H. McFann 2 ..... Dry
18-17-13, Berryhill, Gladys Oil 5..... Gas

Gas 9
Dry 30
Gas 50,000,000

OKMULGEE COUNTY.

Mounds—
4-15-11, Stearns, Sperry Oil & Gas 1..... Dry
28-16-11, Barnett, American Petroleum 1 ..... Dry
4-15-11, Sterans, H. H. McFann et al. 1..... Dry
24-16-11, Adams, J. O. Mitchell ..... Dry
27-16-11, Lewis, Carter Oil 1 ..... Gas
33-16-11, Lewis, Minshell et al. 1..... Gas
24-16-11, Bruner, Kawfield Oil & Gas 1..... Dry
27-16-11, Hadley, Carter Oil 1 ..... Gas
26-16-11, Hill, Gypsy Oil 3 ..... Gas
26-16-11, Anthis, Paraffine Oil 2 ..... Dry
26-16-11, Lannen, Paraffine Oil 1 ..... Dry
27-16-11, Lewis, Carter Oil 1 ..... Gas
19-16-11, Looma, F. Barnes 1 ..... Dry
33-16-11, Lewis, Territorial Oil 1 ..... Gas
18-16-12, Stevens, Posey Thornton O. & G. 4..... Dry
31-16-12, Sharp, Kawfield Oil 1 ..... Dry
26-16-13, Dunlap et al., Solo Oil 7 ..... Gas

Hamilton Switch, Youngstown—
36-14-11, Gill, Okmulgee P. & R. 2..... Gas
25-14-11, Fee, Texas Co. 1..... Dry
19-14-13, Montgomery, Peerless O. & G. 1..... Dry
17-14-13, Berryhill, Ohio Cities Gas 2..... Gas
36-14-11, Foster, W. Phillips et al. 2..... Gas
34-15-11, Isparhecher, Wilcox et al. 1..... Gas
30-14-12, Huckaby, Barbara Oil 1 ..... Gas

Bald Hill and Booch Sand—
4-15-14, Bruner, Tidal Oil 1 ..... Dry
20-15-14, Lewis, Steinberger et al. 7..... Dry
31-14-13, Ben, Botts et al. 2..... Dry
13-14-14, Rentie, Chestnut & Smith 11 ..... Dry
21-14-14, Colbert, Sperry Oil & Gas 12..... Dry
36-14-14, Rentie, E. R. Black et al. 2..... Dry
13-14-14, Sutter, Chestnut & Smith 15 ..... Dry
5-14-14, Deland, P. O. & G. 3..... Dry
23-14-13, Lovett, Reno Oil 1 ..... Dry
22-14-14, Colbert, Okmulgee P. & R..... Dry
29-14-14, Ashley, Truman Oil 5..... Dry
14-15-14, Scott, Musgrove Oil 15 ..... Dry
32-14-14, Rentie, Brady's Bend Oil 3..... Dry

Tiger Flats—
2-13-11, Larney, Carter Oil 1 ..... Dry
36-12-11, Rentie, Foley et al. 1..... Dry
19-12-12, Graves, Luck Tiger Oil 5..... Dry
31-12-12, Rentie, M. Clark 1 ..... Dry
35-13-12, Tiger, Cosden Oil & Gas 2..... Gas
25-13-12, Bank, Cosden Oil & Gas 4..... Dry
6-11-12, Holmes, Humble Oil 4..... Dry

Okmulgee, Morris—
16-13-14, Morton, Oklahoma Oil 1 ..... Dry
34-13-14, Brown, J. H. Rebold et al. 1 ..... Dry
16-13-13, Grace, Okmulgee P. & R. 2..... Dry
2-13-13, Hightower, Nile Oil & Gas 1..... Dry
16-13-14, Morton, Oklamo Oil 5 ..... Dry
34-13-14, Clarney, Rebold et al. 1..... Dry
19-13-14, Willie, W. B. Pine et al. 2..... Gas
7-13-15, Town, Lambert et al. 3..... Gas
23-13-14, Scott, Long et al. 4..... Dry
8-13-14, Landry, D. F. Parker 1..... Dry
10-13-14, McIntosh, Keeton & Reynolds 1..... Dry

Henrietta—
16-11-14, Stand, Okmulgee P. & R. 1..... Gas

Gas 16
Dry 40
Gas 90,000,000

People will not look forward to posterity who never look backward to their ancestors.—Burke.

[illegible] Dry

[illegible] County
[illegible] Okla. Nat. Oil 1 ..... Dry

[illegible] 3
[illegible] 9
[illegible] $0,000,000

ARKANSAS.

[illegible] Okla. Petroleum 1 ..... Dry
[illegible] Harold, Central Coal O. & G. 1 ..... Dry
[illegible] McCann, Harper et al. 1 ..... Dry

Wells completed 3

NEBRASKA.

Dawson County
[illegible] W. Henngler, The Bowsers 1 ..... Dry

KANSAS.

SUMMARY OF WELLS COMPLETED.

	Comp.	Prod.	Dry	Gas
Butler	162	32,093	27	4
Chautauqua Elk	37	562	11	3
Montgomery	39	337	10	1
Miami Franklin Douglas	92	673	18	2
Wilson	27	168	6	2
Allen	22	169	5	1
Neosho	47	641	10	1
Wildcats	48	343	22	2
Total	474	34,986	109	16

OKLAHOMA.

SUMMARY OF WELLS COMPLETED.

	Comp.	Prod.	Dry	Gas
Osage	105	7,328	16	12
Washington	56	665	8	2
Nowata-Rogers	114	915	12	0
Tulsa	84	1,763	30	9
Creek	61	2,114	23	0
Muskogee-Wagoner-Rogers	89	5,668	28	6
Okmulgee	166	5,892	40	16
Pawnee	14	419	1	0
Payne	6	705	1	0
Kay	31	4,520	6	2
Garfield-Noble	16	5,440	3	0
Carter	27	990	6	4
Wildcats	16	180	10	2
Total	784	36,179	184	53

MID-CONTINENT.

SUMMARY OF WELLS COMPLETED.

	Comp.	Prod.	Dry	Gas
Kansas	474	34,986	109	16
Oklahoma	784	36,179	153	57
Arkansas	3	0	3	0
Total	1,261	71,165	265	73

WYOMING.

[illegible] Mack 1 E. Emery Oil ..... Dry
[illegible] Moreland Dom. Rem. Morland ..... Dry
[illegible] Gordon, Ohio Oil ..... Gas
[illegible] Govt. land, Dasien Oil ..... Dry
[illegible] Space land, T. E. ..... Gas

Dry 3
Gas 2

TEXAS-PANHANDLE.

WICHITA COUNTY

Electra—
Waggoner, Texas Co. 31 ..... Dry
Earls, [illegible] Oil ..... Dry

Dry 2

BURKBURNETT AND VICINITY.

Dodson, Pure Oil 2 ..... Dry
Hall, Good Luck Oil 1 ..... Dry
Martin, Myers et al. 1 ..... Dry
Willis, Turner et al. 2 ..... Dry
Watkins, Atkins Oil 3 ..... Dry
Miller, Myers & Stultz 1 ..... Dry
Fowler, Turner et al. 16 ..... Dry
Beach, Shegogg et al. 34 ..... Dry
Daniels, Krehn et al. 7 ..... Dry
Roller, Mann et al. 21 ..... Dry
Knauth, Snyder-Burkburnett Oil 2 ..... Dry
Zeiset, Liberty Loan Oil 1 ..... Dry

Dry 12

WILDCATS.

Brown County—Brownwood—
Sears, Magee et al. 1 ..... Dry

TEXAS PANHANDLE.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry	Gas
Electra	21	717	2	0
Sunshine Hill	28	360	0	0
Burkburnett	56	2,411	12	0
Miscellaneous	13	584	1	0
Total	108	4,072	14	0

NORTH LOUISIANA.

Caddo—
23-21-16. Brooks Fee, The Texas Co. 14 ..... Dry
36-21-15. Dickson, Jim Clark Oil 1 ..... Dry
10-20-15. Glassell, Mo.-La. Oil 4 ..... Dry
De Soto—
23-13-12. Christine, The Texas Co. 27 ..... Dry
Bossier—
29-16-11. Fletcher & Alexander, Atlas Co. 1 ..... Gas
29-16-12. Weaver, Atlas Oil 1 ..... Gas
7-16-11. Giddens, The Texas Co. 1 ..... Gas
Miscellaneous—Caddo—
17-13. Walpoole, Southwestern G. & E. 166 ..... Gas
17-13. Slattery, The Texas Co. C-1 ..... Gas
Morehouse—
33-21- 5. Spyker, Southern Carbon 2 ..... Gas
Ouachita—
12-19- 4. Kerr, Central Co., Inc. 1 ..... Gas

Fortune helps the brave.—Terrence.

SOUTH LOUISIANA

GULF COAST

TEXAS-LOUISIANA

STANDARD OIL SUBSIDIARIES

FINANCIAL REPORT

EVERY MAN A BOND-HOLDER

The great end of life is not knowledge but action.—Huxley.

AROUND THE BELT

New Wells, New Pipe Lines, New Contracts, Additions and Extensions. A Fund of Valuable News Gathered for the Journal Through Many Sources.

TRADE PERSONALS

It will be noted that the names appearing under the personal headings are exclusively those of men interested in the development of the natural gas field. Those wishing to learn of matters pertaining to men interested in the field of artificial gas should refer to THE GAS INDUSTRY magazine, published at 60 Pearl Street, Buffalo, N. Y., which devotes its columns entirely to artificial gas matters. That magazine is published by the publishers of THE NATURAL GAS JOURNAL, each magazine being specificially issued for its respective field. In this way each magazine renders 100% efficiency in the industry it covers.—Publisher's Note.

BEEROWER, LINCOLN, manager of the Enid division of the Oklahoma Gas & Electric Company, has been elected director of the Enid Rotary Club.

CORTELYOU, GEORGE B., President of the Consolidated Gas Company, New York City, has been elected President of the American Gas Association, the national organization which has grown out of the amalgamation of the American Gas Institute and the National Commercial Gas Association.

COX, FRANK, of Charleston, West Virginia, was elected Vice-President of the Merritt Oil & Gas Company, Tulsa, Okla., at the recent annual meeting of that corporation.

DENNING, L. B., of Columbus, Ohio, President of the Lone Star Gas Company, Fort Worth, Tex., is now also assistant to the President and Secretary of the Ohio Fuel Supply Company, Vice-President and General Manager of the Fayette County Gas Company, Secretary of the Ohio Fuel Company, and Secretary and Treasurer of the Tropical Oil Company, filling the vacancies caused by the death of Harry C. Reeser.

DOHERTY, HENRY L., at the commencement of Lincoln Memorial University, Cumberland Gap, Tenn., was awarded the degree of LL.D.

EARNEST, RICHARD H., has been elected Vice-President and General Manager of the Manhattan Oil Company, Tulsa, Okla.

GILLOGLY, J. J., formerly with the Iroquois Natural Gas Company of Buffalo, N. Y., is now with the American expeditionary force in France.

HALL, W. E., has been elected President of the recently formed W. E. Hall Oil & Gas Company, Shreveport, La.

HEATH, CY, is President of the Pet Oil Company, Indianapolis, Ind., the object of which is the selling of mixed artificial and natural gas in Indiana.

HOLBROOK, DAVID O., of Pittsburg, Pa., is the new Secretary-Treasurer of the Natural Gas Association of America.

KECK, WILLIAM M., has recently been appointed Consulting Engineer to the Oil & Gas Department of the State of California.

LEGE, F. M., JR., who has been manager of the Dallas Light & Power Company, Dallas, Texas, is now Vice-President and General Manager of the Lone Star & Gas Company, Fort Worth, Texas.

LYNOT, DR. W. D., formerly safety and welfare expert for the principal companies in the Joplin, Mo., zinc mining district, has been secured by the Empire Gas & Fuel Company. He will remove to Bartlesville, where he will be in exclusive charge of similar operations.

MAGUIRE, A. G., of the Bartles-Maguire Oil Company of Milwaukee, Wis., has been appointed assistant to M. L. Requa, Oil Director of the Fuel Administration. Mr. Maguire will be connected with the purchasing end of the work.

MCCUNE, CHARLES A., has resigned his position as Chief Engineer of the Commercial Acetylene Company, and is now Sales Manager for the Page Steel & Wire Company, 30 Church Street, New York. His activities will be devoted to the selling and service of Armco Welding Rods.

MERRITT, THOMAS A., of Duluth, Minn., at the annual meeting of the Merritt Oil & Gas Company, Tulsa, Okla., was elected President of the company.

OLIPHANT, B. C., of the Iroquois Natural Gas Company, Buffalo, N. Y., was elected Vice-President of the Natural Gas Association of America, at the recent annual meeting of that organization.

RICHARDSON, G. H., formerly auditor of the Oklahoma Gas & Electric Company, Drumright division, is now in the Auditing Department at Oklahoma City. R. D. Beard, formerly of Fort Smith, will succeed Mr. Richardson as auditor at Drumright.

WALTON, J. D., recently became Assistant Superintendent of the Iroquois Gas Company, Buffalo, N. Y.

INCORPORATED

DELAWARE—Dover

The Volcanic Oil & Gas Company of Kentucky has been chartered under the laws of this state by E. M. Haslem, Ferris Giles, and O. M. Ryan, of Wilmington, Del. The company has a capital of $250,000.

INDIANA—Indianapolis

The Pet Oil Company was recently incorporated in this city with a capital stock of $100,000, for the purpose of supplying local consumers with mixed natural and artigcial gas. The President of the company is Cy Heath.

Terre Haute

The Henry Oil & Gas Company has been formed here with a capital stock of $150,000. George F. Kean is among those interested.

The march of the human mind is slow.—Burke.

KANSAS Garden City

LOUISIANA Shreveport

PENNSYLVANIA

OKLAHOMA Tulsa

WEST VIRGINIA

PER CUBIC FOOT—RATES

INDIANA Muncie

There is no debt with so much prejudice put [illegible] as that of natural Pictured

GENERAL

CALIFORNIA—Glendale

The Southern California Gas Company, it is reported, will extend its service to this city.

Ventura

It is reported that a plant will be built here by the State Consolidated Oil Company for the manufacture of gasoline.

DISTRICT OF COLUMBIA—Washington

The British thermal unit in measuring gas is to be made the standardized unit by government authority in the United States, as a conservation proposition.

ILLINOIS—Chicago

Eight of the staff of H. M. Byllesby & Company are reported as having arrived "over there." They are: General George H. Harries, A. W. Carstens, E. K. MacDonald, R. T. Purchas, T. E. Sanford, A. H. Sayre, A. H. Kuhn, and J. J. Nolan.

KANSAS—Finney County

Territory in this county which has been favorably reported upon by geologists is shortly to be tested by the Garden City Oil & Gas Company. The company was recently formed for this purpose.

LaCygne

A 2,000,000-foot gasser has been completed in the fields near this place.

Miami

The Mutual Oil & Gas Company, recently organized, has leased a tract of land in this county, and will begin to drill test wells shortly.

Sedan

The Puritan Oil & Fuel Company recently drilled a well on the Ackerman farm to a depth of 2,000 feet without finding a trace of oil or gas. The water, however, which is present in great volume, is impregnated with mineral substances, which may make it valuable for medicinal purposes.

Bossier Parish

In the Elm Grove district, Bossier Parish, at 875 feet, and the Federal Petroleum Company completed a 15,000,000-foot well on the Union Sawmill Company lease, in section 13-20-3.

Monroe District

The Peerless Carbon Black Company, in its No. 1 on the Moore property in section 35-20-4, completed a 12,000,000-foot gas well. The well was drilled to a depth of 2,150 feet.

New Orleans

The difficulty in obtaining steel pipe is deferring the bringing of natural gas to the city from the Terrebonne district. In this connection, the feasibility of using concrete pipe is being investigated. Experiments are being conducted by Howard Eggleston, Industrial Engineer of the New Orleans Association of Commerce.

Pine Island District

The Standard Oil Company has a showing of oil and gas in a test on the Dixon lease in section 15-21-14, in the shallow sand at 950 feet.

Kinnebrew & Ratcliff completed a 15,000,000-foot well in No. 1 Youree, section 12-21-15, at 2,300 feet. The Richardson Oil Company's No. 2 Christian, section 27-21-15, made a 10,000,000 foot well at 2,250 feet. The Texas Company has a 20,000,000-foot gasser in No. 1 Kelly, setion 8-16-11.

Shreveport

After many unsuccessful attempts to control a wild gas well in the Elm Grove district, 14 miles north of Shreveport, owned by White Brothers and known as Ward Well No. 2, which became uncontrollable last November, a committee composed of J. W. Smith, superintendent of minerals, as chairman, and several officials of local gas companies, recently appointed by Commissioner of Conservation M. L. Alexander, agreed that the only way to control the situation would be to kill Ward Well No. 1, which is owned by the Atlas Company. This was done and since then indications that the activity in the wild well is decreasing, according to statements of the committee.

NEW YORK—Jamestown

The Pine Ridge Oil & Gas Company struck a good flow of gas on the Stowe farm, on the outskirts of the city. The gas was found at a depth of 750 feet. It is the plan to send the drill deeper to test the territory for oil.

Richburg

The Oil & Gas Company has let a contract to drill three wells on a lease in this place.

OHIO—Columbus

This city has been chosen as the place for the 1919 convention of the Natural Gas Association of America, which recently held its annual convention in Pittsburgh.

Coshocton County

In the northwest quarter of section 14, Pike township, the Plymouth Oil & Gas Company's test on the Stanley Sharpless farm is producing 500,000 cubic feet of gas with a light showing of oil.

Findlay

According to report, the Logan Natural Gas Company is facing the possible necessity of having to close down operations in this city on account of shortage of gas supply.

OKLAHOMA—Carter County

The structure as outlined by geologists, running from the Wheeler field in Carter County, through the Graham and Fox countries and extending up into northern Stephens County, is being proven productive of oil and gas.

Covington

The natural gas line from the gas fields north of the city is completed, and the city distributing system is rapidly nearing completion.

Self-trust is the first secret of success.—Emerson.

Creek County

The Magnolia Petroleum Company has drilled in its test on the Jones farm in section 36-18-7. It is making 5,000,000 feet of gas in the Bartlesville sand at a depth of 2,928 feet.

The Magnolia Company also has a gasser in section 34-17-7 on the Boome property, which is said to be good for 23,000,000 cubic feet. The gas is from the Bartlesville sand at 2,732 feet.

On the Agent farm, in section 24-17-12 Swoveland and others have a 100,000-foot gasser in their No. 1 at a depth of 1,725 feet.

Haskell

In the Haskell district, in Wagoner and Muskogee counties, Cosden and others completed No. 5, in section 26-16-15, in sand at 1,352-64 feet, and have a well doing 6,000,000 feet of gas and 5 barrels of oil.

On the Lewis farm in section 1-7-18 the Pittsburg Oil & Gas Company has a gasser which is said to have a capacity of 30,000,000 cubic feet. The gas is in sand from 1,547 to 1,643 feet.

Healdton Field

The Kirk gas well, in section 31-2s-1w, on the Bennett farm, has been shut in as a gasser.

The Sparks Oil & Development Company is building a California rig on the Sparks farm in section 30-2s-2w, about 300 feet northeast of the Kirk gasser in section 31.

The Phillips Petroleum Company's Tucker No. 1, in section 29-2s-3w, is making about 40,000,000 cubic feet of gas from sand found at 1,860 feet. The company's No. 4 Tucker is on top of a gas sand at 1,942 feet, and is waiting for cement to set before drilling in.

Kay County

The Empire Gas & Fuel Company has an 8,000,000-foot gasser in its No. 4 on the Shurtz farm in section 31-27-1.

The Southwestern Oil has a 15,000,000-foot gasser at 1,360-80 feet in No. 7 on the Welch farm, in section 20-28-1 east.

Glaman Oil Company completed a 100-barrel well in sand at 1,648-53 feet, on the Perry farm, in the northeast corner of the southwest of the northwest quarter of section 29-28-1.

Kay County

The Empire Gas & Fuel Company has a 13,000,000-foot gas well in No. 2, on the Pratt farm, in section 31-29-1 east, from sand at 2,588 to 2,602 feet.

Anderson & Johnson have a small gas well on the Sango farm in section 21-13-15. The gas was found at a depth of 1,960 feet.

Chestnut & Smith, in their No. 3 on the Rentie land in section 19-14-15, have a well making 3,000,000 cubic feet.

Muskogee County

The Oklahoma-Iowa Oil Company brought in a well on the Taylor land in section 21-15-16 which produced a 20,000,000-foot gasser in the beginning, then a large quantity of water, and finally ceased producing both the gas and the water.

Oklahoma City

Of the staff of the Oklahoma Gas & Electric Company, twenty-seven are now in government service.

Okmulgee

The Okmulgee Producing & Refining Company, on the Sone farm in the Morris district, section 9-13-12, reports a 3,000,000-foot gasser, which is also producing 25 barrels of oil.

Osage

In section 32-22-10 E. N. Gillespie has completed a 20,000,000-foot gasser.

The Clover Oil Company's No. 2, on lot 202, in section 36-27-11, is making 2,000,000 cubic feet of gas at a depth of 1,785 feet.

The Osage Oil & Refining Company has a 4,000,000-foot gas well at 1,075 feet in its No. 1, in section 18-24-12.

The Magnolia Petroleum Company, in its No. 12 on lot 90, in section 27-22-12, has a well producing 1,000,000 cubic feet.

Pawnee County

The Magnolia Petroleum Company has a 5,000,000-foot gasser in its test on the Jones farm, in section 36-18-7. It is in the Bartlesville sand at 2,928 to 3,001 feet. The same company's No. 2 Boone, in section 34-17-7, is good for 23,000,000 feet of gas from the Bartlesville sand at 2,732-2,802 feet.

Payne County

The Creek County Gas Company has a large gasser on the J. W. Fried farm in section 25-18-5e, at a depth of 2,978 feet.

Rogers County

In the Collinsville district, two gas wells were opened up by the Henry Oil Company, one on the McLemore farm, in the southeast of the northeast quarter of section 23-23-14, good for a little less than a million feet, from sand at 1,212 to 1,221 feet, and the other on the Edwards farm, in the southwest of the southeast quarter of section 26-23-14, with a capacity of 3,000,000 feet from sand at 1,135-50 feet.

Stephens County

The Guiding Star Oil Company has a 5,000,000-foot gas well in No. 4, on the James farm, in section 12-1n-6w.

Tulsa County

The Paxton Oil Company has completed a good gasser in its No. 2 well in the Rogers property in section 20-19-11.

At the annual meeting of the Merritt Oil & Gas Companq, the following officers and directors were elected for the ensuing year: Officers, Thomas A. Merritt, President; Frank Cox, Vice-President; N. J. Gubser, Secretary; and S. W. Eckman, of Denver, Treasurer; directors, A. E. Humphreys, Denver, Colo.; John B. Means,, Tulsa, Okla.; Thomas A. Merritt, Duluth, Minn.; N. J. Gubser, Tulsa, Okla.; Frank Cox, Charleston, W. Va.

Labour to keep alive in your breast that little spark of celestial fire,—conscience.—Washington.

Tulsa County

The Texas Company has a 3,000,000-foot well in its No. 1 on the McPherson property in section 6-23-13. The gas was found in sand at 1,635-1,700 feet.

Washington County

In the Bartlesville district, the Kawfield Oil Company's No. 12, on the Step land in section 16-28-13, is estimated at 1,000,000 cubic feet.

Yale

The Roma Oil Company's No. 1 on the Cole farm, in the center of the north line of the northeast quarter of section 11-18-6, drilled into a gas sand at 2,904-37 feet and has a well with a capacity of 15,000,000 feet backed by a rock pressure of 1,060 pounds.

Youngstown

L. S. Skelton, in his test on the Narcome farm, in section 35-14-12, is a 6,000,000-foot gasser at 1,950-54 feet.

The Texas Company, in its No. 9 fee, section 25-14-11, developed a 9,000,000 cubic foot well, which has also an oil production of 10 barrels.

PENNSYLVANIA—Allegheny County

In the Unity district, Plum township, the People's Natural Gas Company has completed a test on the William Batett farm, and it is a gasser.

In the Brush Creek John Williams' No. 2, on the Milton Irwin farm, is a gasser in the fourth sand.

In the Imperial district, Jones & Company have a light Gordon sand gasser on the John Steinmetz farm. In the Duff City field Harbison & Company's test on the J. Purvador farm is a duster. In the Crafton district, Yolton & Company got a light gasser at a second test on the Beals farm.

Clarksville

It is reported that the United Natural Gas Company will extend its service to this place.

Crawford County

In Rockdale township, gas has been struck in a test well drilled on the Beedy farm.

Emporium

The service of the St. Marys Gas Company of St. Marys, Pa., in this city, is to be extended.

Greene County

On Coon Run, Springhill township, the Carnegie Natural Gas Company has drilled No. 3 on the S. B. Keffer farm through all sands at a depth of 3,209 feet. Light gas pressure developed in the fourth sand.

In Jackson township, the Philadelphia Company's test on the Jesse Thomas farm is a gasser in the Gordon sand.

On Coon Run, Springhill township, the Manufacturers Light & Heat Company is through all sands at a second test on the Robert Cooper farm. It is a small gasser in the Big Injun sand. It was drilled to a depth of 3,339 feet.

Harrisburg

The Manufacturers Light & Heat Company, supplying gas in Pennsylvania, Ohio, and West Virginia, is asking permission to advance its rate to domestic consumers to 32 cents per thousand in a new petition recently filed.

Sheffield

The Eagle Rock Oil Company has acquired the entire holdings, franchise, pipe lines, gasoline plants, etc., of the Citizens Gas Company of Sheffield, Pa., which company has been supplying domestic consumers in Sheffield for many years.

Washington County

In the Washington district the Manufacturers Light and Heat Company's tests on the J. B. Greenlee and Swart farms are both gassers. In the same district the People's Natural Gas Company's test on the J. C. Bane farm is also a gasser.

Waynesburg

A well has been completed in the nearby fields which is reported to be making 2,000,000 cubic feet.

TEXAS—Forth Worth

Profits in the sum of $772,630 for the fiscal year just closed are reported by the Lone Star Gas Company, as compared with $517,720 for the preceding twelve-month period.

Ranger

On the Stewart farm, the Texas & Pacific Coal Company have shut their well in for a gasser on top of the lime at 3,205 feet where a fishing job has been in progress for some time, and another test will be started for oil. The well is making approximately 4,000,000 cubic feet of gas. The No. 1 Rust, of the same company, in the west edge of Ranger, is showing some oil and gas on top of the lime at 3,250 feet.

A shallow sand gas volume was uncovered at 2,150 feet in a test on the Brewer farm of the Texas & Pacific Coal Company, four miles south of town, and near the Merriman school house. The volume is estimated at 3,000,000 cubic feet.

Valers

One mile west of Valers, Woods & Wooley are reported to have a 1,000,000 cubic foot gas showing at 1,190 feet on the Overhall tract.

WEST VIRGINIA—Braxton County.

On Steer Creek, Birch district, the Philadelphia Company's test on the G. B. Howell farm is a gasser in the Big Injun sand.

In Birch district, the Philadelphia Company's test on the H. M. Bourne farm is a gasser in the Big Injun sand.

Calhoun County

On Three Mile Creek, Sheridan district, the same company's second test on the W. R. Bush farm, is a gasser in the salt sand.

Doddridge County

On Buckeye Fork, Greenbrier district, the Hope Natural Gas Company has a Gordon-sand gasser at its test on the A. B. Freeman farm.

In Greenbrier district, the Eastern Petroleum Company has a fair gasser at a test on the John A. Davis farm.

Example is the school of mankind, and they will learn at no other.—Burke.

Gilmer County

On Tanners Creek, Dekalb district, the Hope Natural Gas Company's test on the America Boylen farm is a gasser in the Big Injun sand. On Laurel Run in the same district, the Continental Oil & Gas Company's test on the W. B. Howell farm is a gasser in the Big Injun sand.

Hancock County

In Grant district, located one mile east of the Brenneman field, Mahan & Company have completed a wildcat on the W. C. Mahan farm. It is a gasser in the Berea grit.

Harrison County

On Cole Davisson Run, Simpson district, the Clarksburg Light & Heat Company's test on the W. G. Kester farm is a gasser in the Big Injun and fifth sands.

In Sardis district, the Hope Natural Gas Company has drilled on the W. L. Dawson farm and it is a fair gasser. In the same district the South Penn Oil Company has the rig completed for one on the Wetzel heirs' farm.

In Grant district the Philadelphia Company has drilled on the Porter Maxwell farm, developing a light gasser. The Hope Natural Gas Company is drilling a second test on the A. W. Smith farm.

On Painter fork, Eagle district, the Hope Natural Gas Company's test on the M. E. Copenhaver farm is a gasser in the Gordon sand.

Kanawha County

On Kelly's Creek Godfrey L. Cabot has a million-foot gasser at his test on the M. F. Spruce farm. Godfrey L. Cabot & Thomas have drilled a test on the George E. Thomas farm through the Weir sand and found it barren. It is being drilled to the Berea grit.

Lawrence County

Extensive oil and gas operations by the Manufacturers' Light & Heat Company are indicated by 41 oil and gas leases recently recorded. The leases are taken on farms in Shenango and North Beaver Townships, 29 in the former and 12 in the latter.

Lewis County

In Freeman's Creek District, the South Penn Oil Company drilled its test on the John C. Starcher farm through the Gordon and fifth sands. It is dry in both formations but a fair gasser in the Gantz sand.

The Hope Natural Gas Company has a gasser at its second test on the John Taylor farm.

On Smoke Creek Run, Freeman's Creek district, the same company completed a Gordon-sand gasser on the J. J. Taylor farm.

Lincoln County

On Furnett Run, Laurelhill district, the Columbia Gas & Electric Company has a gasser in the Big Injun sand at a test on the J. B. Cummings farm.

Marion County

On Ministers Run, Paw Paw district, the Owen Bottling Works Company has a light gasser in the fifth sand on the J. L. Michaels farm.

On Bartholomew Run, Mannington district, the Hope Natural Gas Company has completed a test on the E. H. Hudson farm. It is a gasser.

In Mannington district the South Penn Oil Company has a Big Injun sand gasser at No. 4 on the Gump farm.

Monongalia County

On Miracle Run, Battelle district, the West Virginia Traction Company has a fourth-sand gasser at its test on the Shriver heirs' farm.

On Scott's Run, Battelle district, the Hope Natural Gas Company has completed a test on the Elum Park farm. It is a light gasser in the Bayard sand. This well was drilled to a total depth of 3,365 feet.

On Miracle Run, in the same district, the South Penn Oil Company drilled a second test on the S. T. Fordyce farm, through the same formation, securing a good gasser at a depth of 3,444 feet.

On Dunkard Creek, Battelle district, the Philadelphia Company's test on the Lemley-Tennant farm is a gasser in the fourth sand. A light show of oil was developed in the same formation.

In the deep sand territory in Battelle District, located on Miracle Run, the Hope Natural Gas Company's test on the Isaac Lemley farm is showing for a light gasser in the Bayard sand.

On Day's Run, Clay District, the Hope Natural Gas Company has drilled No. 5 on the David Haught farm from the Gordon to the Bayard sand at a depth of 3,440 feet. It is a fair gasser in the lower formation.

On Jakes Run, Clay District, the Eddy Oil Company's test on the W. H. Eddy farm is a gasser in the Big Injun sand.

Pleasants County

On McKim Creek, McKim District, the Walnut Run Oil Company's test on the W. O. Dotson farm is a light gasser in the Keener sand.

On Sheat's Run, Union District, Smith, Eddy & Co., have drilled a test on the S. D. Martin farm through the Cow Run sand and it is showing very light.

Ritchie County

On the north fork of Hughes River, Clay District, the Philadelphia Company's second test on the Edmond Taylor farm is a gasser in the Squaw sand.

On McKim Creek, the Walnut Run Oil Company's test on the W. C. Dotson farm is a gasser in the Keener sand.

On Burton Run, Clay District, the Philadelphia Company got a gasser in the Big Injun sand at its test on the A. A. Lantz farm.

On the south fork of the Hughes River, Murphy District, Ira Haught has completed a test on his own farm. It is a salt sand gasser with a capacity of 6,000,000 cubic feet a day.

Tyler County

On Sancho Creek, Centerville District, the Wiser Oil Company's test on the E. C. Pierpont farm is a gasser in the Big Injun sand.

Be ruled by time, the wisest counsellor of all.—Plutarch.

On Big Run, Centerville District, the Carnegie Natural Gas Company has drilled a second test on the Minnie McCullough farm through the Big Injun sand, developing a fair gas pressure in that formation.

The Mid-Continent Gasoline Company has a light gasser in its No. 2 test on the F. Wilson land.

Volcano

The Hope Natural Gas Company has encountered difficulties in its deep test on a lease in the old White Oak field, near here. The well caved in at a depth of 4,535 feet, at which depth a heavy flow of gas was found.

Wetzel County

On Little Creek, Greene district, the Larimer Oil Company's second test on the Lindsey Burley farm developed a light show of oil and a small gas pressure.

On Long Drain Run, Church district, the Manufacturers Light & Heat Company's No. 4, on the M. A. Teagarden farm, is a gasser in the Big Injun sand.

On Fish Creek, Church district, the Blackshere Oil & Gas Company has started to drill on the A. K. Whistler farm.

On Fish Creek, Church district, the Carnegie Gas Company has a Big Injun sand gasser at a test on the J. A. Lemley farm.

WYOMING—Casper

The Curtis Petroleum Company has a gasser estimated at 20,000,000 cubic feet in its No. 2 on the Iron Creek dome, about twenty miles southwest of Casper.

Iron Creek

The New York Oil Company and the Curtis Petroleum Company have let contracts for the drilling of three wells in this field.

ONTARIO—Chatham

In Dover Township the Union Gas Company recently drilled in an oil well which is producing between 400 and 500 barrels a day. The well has a heavy gas pressure.

Elgin County

The gasser drilled early in March by the Dominion Natural Gas Company near Port Talbot, and which started off with an estimated capacity of 5,000,000 to 7,000.000 cubic feet per day, is now reported to be producing only 600,000 cubic feet, but looks like a steady producer on this basis.

Guelph

It is reported that both the Trenton Oil & Gas Company and the Rockwood Oil & Gas Company have encountered shallow oil indications on the Rockwood anticline, in Wellington and Halton Counties, near Guelph.

Kent County

It is reported that the No. 1 well of the Union Natural Gas Company, in Dover Township, which was drilled in six months ago, is still producing 60 barrels of oil per day, as well as several million cubic feet of gas.

The Union Natural Gas Company's No. 7 well, on the Meyers farm, found good production of gas at a depth of 2,931 feet, at 2,953 feet, and again at 2,984 feet. The drill is now down 3,100 feet.

The H. D. Symmes well on the St. Luke's Club property, Dover Township, was shot a second time, but developed only about 50,000 feet of gas. A third shot will be attempted.

Norfolk County

The Dominion Natural Gas Company has located a test on the John Martin property at Port Dover.

...n Natural Gas Company will be available at Port Dover when this one is finished.

West Aboyne

...Preston gasser drilled by the Provincial Natural ... on the Page farm in the Niagara field, last ... is proving a fair producer. The well is good ... stream flowing and 750 cubic feet per day, and ... rock pressure indicates fair permanence.

Sherbrooke Township

...Steel Pipe Line Company, Ltd., recently completed ... in this field, which are said to have a capacity ... cubic feet each.

St. Catharines

...natural gas will be ... fuel ... Railway and Motor ... to the ... ...

Saskatchewan—Regina

...

National War Savings Day June 28th

That's the day we sign up.

That's the day we tell Uncle Sam just how hard we want to win this war. That's the day our government has officially set for us to purchase War Savings Stamps.

On June 28th every man, woman and child in the United States will be called upon to pledge his or her full quota of War Savings Stamp purchases for 1918.

You will be expected to pledge the **full** amount that you can afford—no more—but by the same token, no less.

In every state, county, city, town and village the War Savings Committees are preparing for this big patriotic rally of June 28th. Unless you have already bought War Savings Stamps to the $1,000 limit, get busy with paper and pencil and figure out the **utmost** you can do.

Remember this. You take no chances when you go the limit on War Savings Stamps. They are the best and safest investment in the world. They pay you 4% interest compounded quarterly. They **can't** go below par. You can get back every dollar you put into War Savings Stamps **any time you need it.** You can turn them in at the Post Office **any time** for their full value plus interest.

Uncle Sam is asking hundreds of thousands of men to **give** their lives to their country. He is asking you only to **lend** your money.

What are **you** lending?

National War Savings Committee, Washington.

W.S.S.
WAR SAVINGS STAMPS
ISSUED BY THE
UNITED STATES
GOVERNMENT

Contributed through Division of Advertising *United States Gov't. Comm. on Public Information*

This space contributed for the Winning of the War by

THE NATURAL GAS AND GASOLINE JOURNAL, Buffalo, N. Y.

Natural Gas and Gasoline
JOURNAL

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CONTENTS FOR JULY, 1918

VOLUME 12
THIS NUMBER 7

PUBLISHER'S NOTICE

PUBLISHED MONTHLY.

Advertising Copy should be in by the 15th of month previous to issue.

ADVERTISING RATES on request.

CORRESPONDENCE IS SOLICITED from all those interested in Natural Gas and kindred industries.

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LUCIUS S. BIGELOW, *President and Editor.*
HARRIS S. BIGELOW, *Secretary.*

Entered as second class matter December 1, 1910, at the Post Office at Buffalo, New York, under the act of March 3, 1889.

CONTENTS OF THIS ISSUE

INDEX OF PAST 1918 ISSUES

MEMBERS OF ASSOCIATION OF NATURAL GAS SUPPLY MEN

DAVID O. HOLBROOK, President, [illegible] Building, Pittsburgh

[illegible] ADAMS, Secretary, [illegible] National Bank Building, Pittsburgh

Ajax Iron Works, Corry, Pa
Allegheny Steel Co., Pittsburgh
Anchor Packing Co., Pittsburgh

Bessemer Gas Engine Co., Grove City
Blodgett Co., Inc., [illegible]
Borden Company, Warren, Ohio
Bovaird & Seyfang Mfg Co., Bradford, Pa
[illegible] Waterbury, Conn
[illegible] St. Louis
Bryant Heater & Mfg Co., Cleveland
Buffalo Co-operative Stove Co., Buffalo
[illegible] Iron Fdy, Providence
Byers, A. M. Co., Pittsburgh

Carnegie Steel Co., Pittsburgh
[illegible] Mfg Co., Pittsburgh
[illegible] Boiler Mfg Co., [illegible]
[illegible] Mfg Co., [illegible]
[illegible] Meter Co., Cleveland
[illegible] Mfg Co., Pittsburgh
[illegible] Huntington, W. Va
[illegible]

[illegible]

[illegible] Mfg Co., [illegible]
[illegible] Water Heater Co., St. Louis
Jones & Laughlin Steel [illegible] Pittsburgh, Pa

LaBelle Iron Works, [illegible]
Lattimer-Stevens [illegible]
[illegible] St. Louis
[illegible]
[illegible] Mfg Co., Pittsburgh

[illegible] Mfg Co., Pittsburgh

[illegible] & White [illegible] Chicago
[illegible] Mfg Co., [illegible]
[illegible] Mfg Co., [illegible]
[illegible] Mass
[illegible]
[illegible] Pittsburgh
[illegible] Mfg Co., [illegible] Pa
Mueller, H. Mfg Co., Decatur, Ill

[illegible] Mfg Co., New [illegible]
[illegible] Pittsburgh
National [illegible] Pump & Mach [illegible] Pa
National Tube Co., Pittsburgh
[illegible] Gas & [illegible] Buffalo
[illegible] New York City
[illegible] New York
[illegible]

[illegible] Pa
[illegible] Trade Journal, New York
[illegible] Pittsburgh
[illegible]

[illegible] W. Va
[illegible] Pittsburgh
[illegible] Pittsburgh
[illegible] Warren, Pa

[illegible]

[illegible] Wheeling
[illegible] Pa
[illegible] Pump & Mach [illegible] Buffalo
[illegible] Mass

[illegible] Chicago

COMMERCIAL CONDITIONS.

INDUSTRIES in the United States are increasing in number, the new and large corporations formed during April had authorized capital of 256 million dollars compared with 197 million dollars a month ago and 439 million dollars for such incorporations in April a year ago.

New munitions companies had capital of 5,100 thousand dollars compared with nothing a month ago and 100 thousand dollars a year ago.

New airplane companies had capital of 250 thousand dollars compared with 6,250 thousand dollars a month ago and 3,198 thousand dollars a year ago.

On the whole, present business conditions compare very favorably with a year ago.

New oil concerns had capital of 61,729 thousand dollars compared with 41,400 thousand dollars a month ago and 23,285 thousand dollars a year ago.

The total authorized capital of new shipbuilding, munitions, airplane, chemical and oil firms organized since August, 1914, is $2,620,000,000.

New oil production for April amounted to 125 thousand barrels compared with 177 thousand barrels in March and 92 thousand barrels in April of last year. Crude petroleum stocks held by the various pipe line companies on the 1st of April totaled 90,091 thousand barrels compared with 90,375 thousand barrels a month ago and 93,686 thousand barrels a year ago.

The last Federal report on crops indicates a winter wheat production of 573 million bushels, a gain of 13 million bushels over the condition a month ago and an indicated increase of 155 million bushels over last year's crop. The rye crop is now estimated at 83 million bushels compared with 60 million bushels last year. The production of hay is estimated at 108 million tons compared with 95 million tons a year ago. Spring wheat planting is nearly finished in the far north and winter wheat harvest has already begun in the far south. Never since crop conditions have been generally reported has the outlook for the average of all crops been better than it is at this time. This prospective big grain crop coupled with more economical use of grains in this country would mean much to the people of Western Europe.

Bank clearings at the principal cities during April amounted to over 26 billion dollars compared with 25 billion dollars a year ago, the increase being 6%. Exclusive of New York City, clearings were more than 12 billion dollars compared with more than 10 billion dollars a year ago, the increase being 20%. Total clearings for April set a new high record for the month and more than one hundred of the principal cities set a new high mark for April.

Business failures during April numbered 869 compared with 990 a month ago and 1,088 a year ago, the number of failed concerns making the smallest April record in eleven years. Liabilities of the failed concerns were 13 million dollars compared with 15 million dollars a month ago and 12 million dollars for concerns failing in April, 1917.

FROM THE EDITORIAL MAIL BAG

HERE'S AN OPPORTUNITY.

A Test of Loyalty to Our Country, to Our Men, and to Our Cause, is Offered by the U. S. Fuel Administration

WE have known for some time that the government would ask through its fuel administration that the people of this United States who drive motor cars should Hooverize on gasoline as they have on food stuffs.

The Fuel Administration has thoughtfully not waited until there is a scarcity of gasoline before bringing to the attention of Americans the fact that while at present there is a stock of gasoline ample to supply the war demands and to allow a normal ra[illegible] consumption of the commodity in the country [illegible] growing demand for gasoline to supply airplanes that are now being [illegible]pleted in large numbers and motor transports growing in number [illegible] standardized government trucks which are now perfected and are being turned out in large numbers.

[illegible]

[illegible]

> [illegible]

[illegible] the standpoint [illegible] the standpoint of [illegible] to conserve without forced requirement than to [illegible] gasoline put on a forced re[illegible]

The editor of The National [illegible] is not advertising Ford cars [illegible] following statement but offers it to illustrate a method [illegible] conservation.

The editor shortly since at a banquet [illegible] with Mr. A. C. Bedford, head of the Standard Oil Company, remarked that since it was known to him that the department of administration work at Washington in which Mr. Bedford is exceedingly act[illegible] request of the public careful and willing conservation of gasoline he had purchased a Ford car and was running it about 80 per cent of the time instead of his many times heavier Packard car in order to begin on conserving gasoline even before public request had been made by the administration.

Mr. Bedford, as we have said head of the Standard Oil business producers of gasoline, replied: "You certainly have nothing on me, for I laid up my Packard last fall and bought a Ford which I have been running much of the time since then."

We are very glad of an opportunity to [illegible] that the Chairman of the Petroleum War Service Committee, namely Mr. A. C. Bedford, is far from being one of those who might be accused of not taking his own medicine. We have found Mr. Bedford exceedingly honorable in all of his dealings [illegible] square deal [illegible]

DINNER TO JOHN G. PEW

MR. JOHN G. PEW [illegible] years has been [illegible] up with [illegible] Natural Gas Com[illegible] Company [illegible]

[illegible]

The Hope Natural Gas Company [illegible] Manager [illegible] Sullivan. He [illegible]

Man is not the creature of circumstances. Circumstances are the creatures of men. Disraeli

Corrin; Chief Engineer, H. C. Cooper; Treasurer, R. D. Beardslee; General Superintendent, J. J. Evans.

Of the Peoples Natural Gas Company John B. Tobin becomes General Manager and Vice-President; H. C. Cooper, becomes Chief Engineer.

Of the Reserve Gas Copany, John B. Corrin accepts the office of General Manager and Vice-President. R. D. Beardslee, becomes Treasurer, as he is also treasurer of the Hope Company. Likewise, H. C. Cooper, Chief Engineer of the Hope Company is Chief Engineer of the Peoples Company.

T. O. Sullivan, the new General Manager and Vice-President of the Hope Company has been for a matter of ten years connected with the Manufacturers' Light & Heat Company. He was General Manager, while the new General Manager of the Peoples Gas Company, John B. Tobin, was formerly the Treasurer of that same company.

The dinner at Pittsburgh was a notable one.

PIQUA, OHIO, CELEBRATES.

THE recent natural gas celebration in Piqua, Ohio, was one of the most enthusiastic public demonstrations which has ever taken place in that city. Early in the afternoon the business houses and many private residences were appropriately decorated and the gas arches completed.

Long before dusk crowds of people from neighboring towns and the country 'round began to flock into the city. There have been but few events in Piqua which have aroused more interest among the populace as comparatively everybody left their homes and thronged the streets to witness the demonstration.

The whole scene was one of great beauty and long to be remembered by all who witnessed it. Altogether the celebration was a proper demonstration in honor of that great progressive factor, natural gas.

The foregoing is a clipping from the Piqua, Ohio, Daily Call, of June 19, 1888. "That great progressive factor, natural gas," is now being served to the people of Piqua by The Ohio Fuel Supply Company. It is interesting to note that Piqua has enjoyed thirty years of natural gas service.

CONSERVING OF GAS.

IN reply to a letter to Mr. Boyd E. Horner, of Clarksburg, West Va., on the subject of *conservation of gas*, Mr. Horner writes that which is certainly encouraging. His letter is as follows:

Clarksburg, W. Va., June 3, 1918.

Natural Gas and Gasoline Journal,
Buffalo, N. Y.

Gentlemen:—

Replying to your letter.

All operators are working to conserve gas, in every way, no leaks in lines or around connections are permitted; old wells, in which the production has decreased materially and a number of which have apparently been exhausted. are being repaired by the use of bailing machines, with which light drilling can also be done, such as drilling out cavings or in tubing of different size, and this machine is also very valuable in wells that have become salted, of which there are quite a few in this section, when salted these machines can readily drill up the salt.

The different gas associations and organizations meet frequently and always have for discussion the conservation of gas.

All operations in the field, for which gas is used, such as drilling boilers, etc., are required to use low pressure burners and pay for the gas by the thousand instead of flat rate, which teaches economy for they are always watching the meter.

There is a tendency to get away from Industrial consumption by increasing the industrial rate materially. The larger companies are endeavoring to establish a preferred rate which will be equivalent to a domestic rate, and are also securing from the Public Service Commission an increase in all rates for domestic use and otherwise.

I, personally, think selling all gas by meter and at a pretty good price will do more than any other one thing to conserve the gas.

Very truly, BOYD E. HORNER.

INTERIOR LAKES TRAVEL.

LAKE ERIE is one of America's most beautiful sheets of water, and one sailing from Buffalo to Cleveland, or over the reverse route, enjoys for a part of the time the shore line, while at other times nothing but the blue of the lakes and the sky is to be seen, save here and there a sailing vessel, a passenger steamer, or a great freighter.

Summer travel by train is dusty and hot, yet of course there are links in travel that must be by rail. Where, however, there is a water-link, such as the run between Buffalo and Cleveland, it is a great relief and exceeding pleasure to change from rail to steamer.

The largest and most magnificent side-wheel steamer plying on fresh water in the United States, is the steamship "Seeandbee." The sister ship is the City of Buffalo. These are large and commodious steamers plying alternately every night between these, the two great cities of Lake Erie. The sailings from Buffalo are at 8:00 P. M., arriving at Cleveland at 7:30 A. M., leaving Cleveland at 8 P. M., arriving at Buffalo early the following morning.

The staterooms may be had complete, or single berths, in two-berth staterooms may be secured. It is well to comunicate in advance, however, with the Cleveland or Buffalo office of the Cleveland & Buffalo Transit Company, of which Mr. H. R. Rogers, a most affable officer, is traffic manager.

We offer the suggestion presuming that many of those who read our magazines may possibly have little acquaintance with the facts that we are tendering them.

Prosperity makes friends, adversity tries them.—Syrus.

ASSISTANT TO PRESIDENT

[illegible] of our national Natural [illegible] to me and where the [illegible] as Ohio operators the name of [illegible] ing has become familiar [illegible] to us not exceedingly helpful manner the [illegible] Denning who is an able attorney [illegible] ought to the ins and outs [illegible] Denning's knowledge has led him [illegible] to read by attorneys [illegible]

[illegible] thing. Mr. Denning [illegible]

Mr. Denning [illegible]

VISITING OIL PRODUCERS

I [illegible] Mr. Denning, [illegible] general counsel [illegible] company of which Mr. [illegible] recently Assistant to the [illegible] to succeed Mr. Rockefeller [illegible] having passed away [illegible] a recent visit of [illegible] to Ohio. Mr. Brown [illegible] answer what he considered [illegible] to. The answer was [illegible] ready to give the right [illegible]

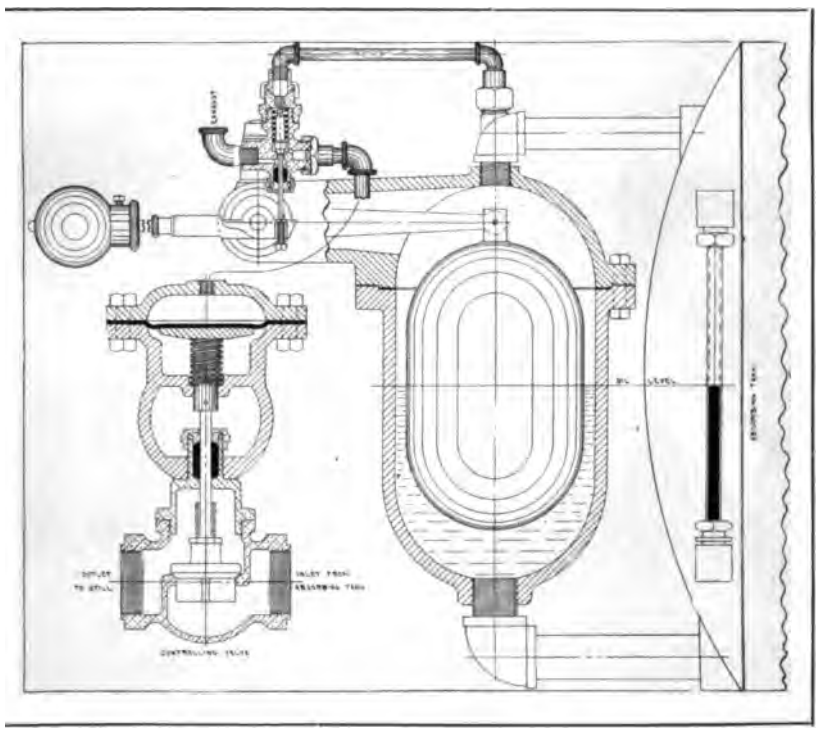
To believe with certainty, we must begin with doubting Stanislaus

AUTOMATIC REGULATION.

An Automatic System for the Regulating of Oil Supply in Absorber Tanks.

THE maintaining of a constant oil level in both the absorbing tank and the still, during the process of the manufacture of gasoline by absorbing the gasoline in oil, and subsequently separating the gasoline from the oil by distillation, makes necessary a regulator which will accommodate itself to any type of absorber or steam still, one that will maintain with certainty a constant oil level under all conditions of temperature and pressure.

Twenty-five years ago a feed-water-regulator was devised by the Chaplin-Fulton firm of Pittsburgh. Little



WORKING DIAGRAM OF "VIGILANT" REGULATOR.

was imagined then what possibilities lay in that regulator far beyond its service as a "feed-water" affair.

After the devising and introducing of this device, years ago, by those who have now passed away, but who are succeeded by others of another generation, who continue in the same line of manufactures, the "Vigilant" still continues to perform its original function, that of feeding water to boilers.

It was years after the "Vigilant" made itself known, that the recovery of gasoline by absorption process became an art, and still later, when this recovery developed into a vast industry.

It was found that the "Viligant" mounted on the side of a tank used in this process of gasoline recovery, with the center of the chamber directly opposite the oil-level desired, would bring the exact result desired.

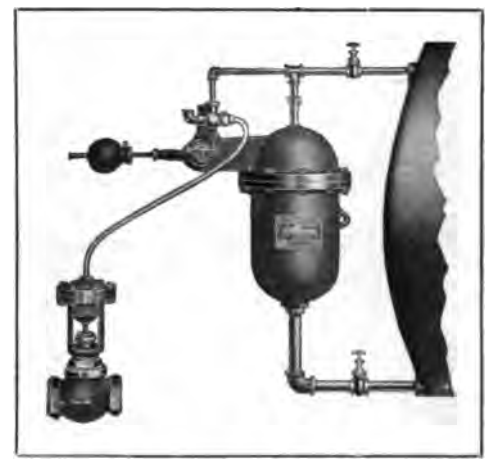
To describe the inside of the chamber of the regulator—there is suspended a displacement body or weight. This is hung from the end of a level, the fulcrum of which is a shaft. One end of this shaft extends through a flushing box, while the other rests on a step inside.

Our illustration of the "Vigilant" attached to the outside of a tank, indicates the exterior, while our line-sketch with weight affixed on arm or "level," discloses the method of operation.

It will be seen that when the oil level rises above the desired point, the displacement body and level will rise, pressing the actuating valve against its top seat causing the exhaust valve to open to the air. The result will be, no pressure on the diaphragm of the controlling valve, it being wide open, allowing the oil to feed out of the tank.

The outward feeding of the oil continues, until the oil-level falls, when the displacement body and the "level," following the oil, will open the gas-connection, shutting the exhaust.

The operation we have described, it will be seen, admits gas-pressure to the diaphragm of the controlling-valve, forcing the valve to its seat, and shutting off the feed.



EXTERIOR VIEW OF REGULATOR.

Naturally, as one will see, no more oil will flow out of the tank until the "level" again commences to rise when all of the operations are reversed and the controlling valve again opens.

The operations continue automatically, and accurately, therefore the device is a valuable adjunct at absorption recovery plants.

A feature of the equipment is that one regulator will control the oil in any number of absorbers in an evaporator.

A stem extends from the valve to a chamber located above the cast iron loop, and is connected to the diaphragm moving in this chamber. Under the diaphragm or piston is a spring which assists to open the valve when there is no pressure on the diaphragm.

When so desired, a controlling valve with a by-pass or continuous feed valve will be furnished. This valve is adjusted by means of a hand wheel, so that oil may flow out of the tank almost as rapidly as it enters.

We are indebted to the Chaplin-Fulton Manufacturing Company for our illustrations.

Apologies only account for that which they do not alter.—Disraeli.

The Matter of Rates

Elimination of Discrimination in Natural Gas Rates by "Readiness-to-Serve" Charges.

According to the proverb the best things are the most difficult Plutarch

the fact that natural gas is an exhaustible resource that is becoming scarcer every year, and it is the only public utility service that does not, and in fact cannot create the basic feature of the service that it renders to the public. There is no regeneration in the present fields, that are now being depleted; when the gas is once used it is gone forever. Every time a natural gas company sells 1,000 cubic feet of gas it is selling a non-replaceable part of its property. That is, the natural gas company is alone in depending entirely on the caprice of nature for first the finding and secondly the continuity of the supply of its primary source of public utility service. This ought to make it self-evident that more latitude must be allowed in natural gas plant standards of service than are neees-sary in other public utilities.

SEC. 7—*Relation of Fixed Charges and Load Factor to Readiness-to-Serve.*

"If the total annual expenses of a utility are taken at 100 per cent, then the fixed charges are that part of the total 100 per cent of annual expenses that must be met in order to maintain the integrity of the property value, regardless of the quantity of service rendered. That is, these fixed charges accrue regardless of the volume of the utility's business and range from 49 per cent to 73 per cent, depending on the type of the utility.

If the total continuous full load of the serving capacity of the plant is taken at 100 per cent, then the load factor is that part of the total 100 per cent of service capacity that is actually sold. Seasonal and hourly load variations —with marked peaks—are conspicuous features of public utility plants. These result in low load factors and many potential service facilities cannot be utilized although the inevitable fixed charges are constantly accruing. Most utility plants must be so operated as to have not more than 30 per cent load factor, with, of course, a large range of individual variations or individual plants."* That is, the utility must be in constant readiness-to-serve, on account of the facts just mentioned, and only a relatively small part of its total serving possibilities can be actually utilized.

SEC. 8—*Peak Loads Increase Cost of Service.*

"An increase of volume of business can decrease the cost of production only when the increment of increase is distributed so as to make possible the more efficient use of existing equipment. When the increment of increase is concentrated so as to require more equipment, as is the case in all peak loads, the cost of production per unit of service is increased. Therefore, the cost of peak load natural gas service is greater than the cost of normal service. A rate schedule, to be equitable to all consumers of natural gas, must make the consumers who need and create the peak load service, pay a price that will be commensurate with the extra cost of the service they are receiving.

"House heating furnace services not only produce marked peaks each day, but the consumption is limited to relatively a short period out of each year. For this reason house heating furnace service costs more than ordinary gas service:"†

SEC. 9—*Distinction Between Luxury and Necessity in Natural Gas Service.*

"To the average family for cooking, hot water boiler heating, lighting and incidental house heating service, natural gas is a necessity, but when used in larger quantities, or for house heating furnace work, it becomes a luxury. Furthermore, the peak load characteristics of house heating furnace service makes this service cost more to the natural gas company. An equitable schedule of rates ought, therefore, to provide for a fixed net price per thousand cubic feet for a large enough monthly consumption to permit of the cooking, hot water boiler heating, lighting and incidental house heating service necessary in the average family. If this fixed consumption is exceeded, then the price per thousand cubic feet for such excess consumption ought to be increased so as to make the consumer pay for the higher priced service he is receiving."‡

It is a trite observation that the luxuries of one day tend to become the necessities of the next. Most complaints for inadequate service, during the few peak load hours—usually less than 1 per cent. of the total 8,760 hours in the year‡—are based on the fallacy that a service which is purely a privlege has become a prerogative. That is, natural gas consumers, as compared with other fuel users who have to use solid fuel or manufactured gas, are a privileged class enjoying a luxury that is seldom appreciated until it becomes difficult to obtain, and on account of the limitations fixed by nature they do not possess and cannot ask any inalienable rights of service, under conditions that are physically impossible to meet.

SEC. 10—*Methods of Selling Utility Service.*

Public utility services are sold by the following three methods:

A. Flat Rate—This eliminates the measuring devices, but is inequitable, places a premium on waste and is desirable from most viewpoints.

B. Meter Rate—Here the charge is based on a certain price per unit of service. This would apparently be just, but it ignores the "readiness-to-serve" and "value-of-service" features, both of which must be considered in the application of an equitable rate schedule. This divides itself into the following:

   a. Straight Meter Rate—That is, uniform price per unit of service to all consumers for certain classes of service. This makes the cost exceed the value of the service in some instances, and the consumer will not use the service. This makes necessary the following sliding scale adjustment:

   b. Meter Rate with Quantity Discount—That is, the price will be decreased as the consumption

*"Value-of-Service" as a Factor in Public Utility Rates With Special Reference to Natural Gas Rates, p. 14. By Samuel S. Wyer.

†Engineering Report on Wholesale Cost and Worth of Natural Gas Service at the Gates of the Various Towns, and Valuation of all the property of the Kansas Natural Gas Company, December 27, 1912. By Samuel S. Wyer.

‡Few people appreciate that even it the service averages below normal 5 hours per day for 17 days, that the total period of normal service is still more than 99 per cent.

Powerful, indeed, is the empire of habit. Syrus.

...quantity used is increased ... when used alone has some unfair features ... that it permits the large consumer to use quite as much at a lower figure than the small consumer, making the discount rate rest on the quantities purchased.

Meter Rate with Quantity Points. This practice the large consumption in accordance with the principles laid down in Section ... Here the schedule begins ... rate for ... month.

Maximum Charge. ... methods ... the ... large ...

Demand Charge. ... large ... possible ... less ... the ... maximum ...

These ... Natural Gas ... Gasoline ...

Men are never so likely to settle a question rightly as when they discuss it freely. — Macaulay

nected load data for water or gas consumers are much more difficult to obtain than for electricity. It is in recognition of this engineering fact that most readiness-to-serve charges for water or gas are proportioned to the size of the meter used for measuring the service, rather than for any connected load that may be put on beyond the meter.

SEC. 14—*Why There Are Relatively Few Adjudicated Readiness-to-Serve Charges.*

The adjudicated minimum charge monetary allowances, now in force in a large number of public utility rate schedules, have thoroughly established the minimum charge doctrine as a fixed part of American public utility jurisprudence.* If, therefore, little question is made of the minimum charge, less question should be raised regarding the more equitable and more just readiness-to-serve charge. As so well stated by the Louisiana Supreme Court:

"It may be well to mention that the principle of making this distinct and separate charge for service is the same precisely which underlies the making of a minimum charge by gas, electricity and water companies, for gas, electricity, or water not used, and that the making of a minimum charge may be said to be universally approved." P. U. R. 1916-E, p. 1017, State vs. Sloan, June 30, 1916 (139 La., —, 72 So. 428).

The large number of readiness-to-serve schedules now in effect—the majority of these in states having public utility commission jurisdiction—show the widespread use of this equitable method of charging. It is for this reason that it is now little questioned and therefore seldom litigated.

SEC. 15—*Judicial Recognition of Readiness-to-Serve Doctrine.*

"The question is whether the said 25-cent charge, thus made 'for service,' was made 'for electricity.' Of course, the customer pays the bill in order to have the electricity, and in that sense the charge is made for electricity. But in another sense, it is not made for electricity, but 'for service'; and the bill on its face shows it.

"The reason why this separate charge is made is this. Electricity cannot be economically stored, and yet the supply must be in constant and immediate readiness on the touch of a button or the turn of a switch. This necessitates the installation and keeping up of a plant and equipment adequate to produce the quantity needed at such times as the demands are heaviest, and not only the quantity which at such times is actually demanded, but also the quantity which might be demanded, and necessarily all that part of this preparation which, at those times when the demands are light, is not called into requisition and especially that part which might, at any moment, be, but never in fact is called into requisition, is idle and profitless. The expense of the preparation thus not utilized together with that of making connections with the premises of customers and the furnishing of meters, being more or less fixed, is sought to be provided for by this fixed 25 cents charge, denominated 'for service,' while the current actually produced and consumed is charged for according to meter reading, at a rate which has been arrived at after taking into consideration this service charge. In other words, this service charge does not represent a bonus to the company, but has been devised as a means of more equitably apportioning among the customers of the company the expenses incident to the installation and operation of the plant."

Louisiana Supreme Court, State vs. Sloan, P. U. R. 1916-E, pp. 1015-6, June 30, 1916.

"We are of opinion that it is more just and equitable to make what is known as a 'readiness to serve' charge in the place of a so-called 'minimum' charge. The ready-to-serve charge is justified on the ground that the utility, after its plant is once constructed and ready for service, may ask each patron to pay a reasonable amount based upon the size of its service pipe, in order to reimburse the utility for the cost of so much of its plant as is required to enable it to at all times stand ready to serve its patrons.

"We have set forth in the schedule which we have prepared, the amount of ready-to-serve charges to be paid by its patrons classified on the basis of the size of the service pipe. These charges, we think, will protect the company in its service, and at the same time will not impose any unnecessary burden upon its patrons."

Pennsylvania Public Service Commission, Ben Avon Borough vs. Ohio Valley Water Co., P. U. R. 1917-C, p. 421, February 12, 1917.

"The costs for domestic, industrial, and public consumers should be met by (1) a fixed service charge, payable whether water is taken or not, and (2) a charge covering proportional or variable costs apportioned on the basis of the quantity of water consumed."

New Jersey Board of Public Utility Commissioners, Re Hackensack Water Co., Rates, P. U. R. 1917-E, p. 179, April 28, 1917.

"In substituting a consumer charge for a minimum charge, the New York Commission, First District, recognized the constant consumer cost which should be borne equitably by all consumers."

New York Public Service Commission, First District, Re New York & Q. E. L. & P. Co., P. U. R. 1917-D, p. 773, April 11, 1917.

"There is much to be said in favor of a minimum or readiness-to-serve charge, and it has been recognized by the commissions and courts of several states, and experience has shown that it is not the poorer class who usually demand the connection and then fail to use the service, but the well-to-do, who have other means of supply and desire the connection only that they may be prepared for emergencies.

"There is a certain amount which the public must pay to enable the utility to operate. If a portion of it is paid in a readiness-to-serve charge, that much less is necessary to be produced from the sale of gas. The readiness-to-

*Tabulation of adjudicated and nonadjudicated minimum charge data in 82-page report made to Hon. Thomas J. Flannelly, District Court of Montgomery County, Independence, Kansas, on "Reasonableness and Legal Right of the Minimum Charge in Public Utility Services." Reprinted by American Gas Institute, 29 West 39th Street, New York City.

That which comes after ever conforms to that which has gone before.—Aurelius.

serve charge does not yield the company any greater sum, nor cost the consumer any more money. It results only in a different distribution of the burden."

Ohio Public Utilities Commission, Re Ashtabula Gas Co., P. U. R. 1917-D., 801, April 24, 1917.

"In most cases the producers of electric lighting also endeavor to so fix their rates as to take account of these differences in the cost as between the short and long hour consumers. In some cases this is done under the so-called 'readiness-to-serve' system of fixing rates. Under this system the consumer is charged a certain sum per month on his installation in addition to a specific rate per unit of current used. The monthly sum charged for the installation is probably intended to cover all or a part of the fixed charges, and appears to vary with the number of lamps installed. The rate per k. w. hr. for the current used is probably designed to meet the variable expenses. Under this system the consumer really pays the company for holding itself in readiness to serve, and it is on the whole an attempt to charge each consumer on the basis of the actual cost of serving him."

Wisconsin Railroad Commission, in re Appl. La. Crosse Gas & E. Co., 2 W. R. C., p. 24 September 19, 1907.

"These rates, which the applicant desires to put into effect for power purposes, are made up of a fixed charge based on the load connected and a variable charge based on the quantity of current consumed. In this respect the proposed rates resemble those which apparently meet conditions in Rice Lake. They differ in having a lower fixed charge and a somewhat higher meter charge than the theoretical rate. This may not be an altogether undesirable feature, as the proposed fixed charge is not so high but that installations may be encouraged thereby, and, at the same time, the meter rate is sufficiently low to invite long daily use of current. The proposed power rate also recognizes the existence of a difference in the ratio of active to connected load, as between small and large installations. This difference is allowed for by a difference in the fixed rate per connected h. p. instead of by a uniform fixed rate based on different percentages of the connected load."

Wisconsin Railroad Commission, In re App. Red Cedar Valley El. Co., 6 W. R. C. p. 762, June 14, 1911.

"There still appears to be much misunderstanding among consumers regarding the service charge which is incorporated in the rate schedule. To make clear just what connection this charge has with the costs of service, a short explanation of the analysis made of the expenses of a utility in working out equitable rates, it is believed, will not be amiss.

"Examining the expense items incurred by a water utility in conducting its business, it is at once apparent that they differ very much in character. Steam generation expenses differ very much from interest on the investment, etc. Careful scrutiny will reveal that there are certain expenses which are fixed and which do not change to any extent with increase or decrease in the amount of water pumped, but are influenced by the capacity of the plant or the demands upon it. Further, it logically follows that there are other expenses which are directly dependent upon the output of the plant, varying directly with the output. These classes of expenses have been variously designated, but the Commission has frequently used the terms 'capacity' and 'output' to distinguish them. Output expenses, or direct expenses, both material and labor, are those that enter into the product itself (water in this case) and can be charged accurately to a particular article or to a particular operation. Capacity, or indirect expenses, are those that cannot be so charged, but must be distributed over that part of the production indirectly affected by such expenses.

"It must be clear that there are expenses which are occasioned by every consumer; capacity or demand charges on the property used and the cost of running, whether for pumping, distribution, management, etc. In other words, as every consumer is responsible for a certain demand upon the plant it cannot be denied that the capacity or indirect expenses should be charged to the consumer upon the basis of his demand. The consumer exercises complete control of the service. Even if for considerable periods his demand is nothing, if he is still connected to the mains of the company, the fact that the latter must be ready at all times to supply the service to the consumer up to his maximum capacity, would necessarily imply, it seems, that of the capacity expenses he should be assessed an amount in proportion to his maximum demand upon the plant. It is clear that service must be rendered simultaneously with the demand for that service.

"Every consumer in addition to the fact that he is subject to demand service in varying quantities up to his maximum demand, should pay for every cubic foot of water he consumes in addition to the demand or consumer charge. In other words, those expenses, which, as stated, are the cost of running or the constant operation of the plant, whether for pumping, selling, management, etc., must be considered separately from the demand of capacity expenses.

"While there may not be the variation in the demand on a water works that is found in the case of gas or electric plants, there are nevertheless seasonal variations in water pumped. In order to meet the annual peak, it is necessary to provide equipment, hence it is evident that the demand is not negligible in any case. Moreover, the fact that a reservoir or stand pipe is immediately required necessitates the assignment or investment and expenses of such units to demand. The demand i s a large factor when we come to consider the distribution system, the size of the mains being determined by the peak demand.

"When it comes to determining the form of rate schedule the question arises, shall the capacity costs and output costs be combined, or shall each be kept separate and distinct? The consumer must pay the capacity cost in either case, hence in most water rate schedules the capacity costs are distributed in the form of a service charge."

Wisconsin Railroad Commission, City of Beloit vs. Beloit W. G. & E. Co., VF W. R. C. pp. 195, 196, 197.

Nothing can come out of nothing, any more than a thing can go back to nothing.—Aurelius.

SEC. 16—*Conclusions.*

1. The primary function of the readiness-to-serve charge is to eliminate discrimination by making all consumers pay for service rendered separate and distinct from gas delivered.

2. The readiness-to-serve charge is more equitable than the minimum charge.

3. There has been a marked lack of appreciation of the distinction between readiness-to-serve charges and minimum charges, and judicial bodies have frequently erroneously used the two terms interchangeably.

4. It is important to bear in mind that regardless of the name applied, the readiness-to-serve charge never includes any quantity of gas.

5. The determination of the proper amount of a readiness-to-serve charge is more a matter of judgment than a following of rigid rules or mathematical calculations. For a given total income, whatever is derived in the aggregate from the readiness-to-serve charge makes the rate per "M" cubic feet of gas actually used that much less.

6. Up to date (April 9, 1918), there has been but one Supreme Court decision (namely Louisiana), sustaining the readiness-to-serve charge principle.

7. The reason why there has been so little litigation is that the readiness-to-serve charge has had such a widespread use that it is now little questioned, and, therefore, seldom litigated.

8. Readiness-to-serve charges have been judicially allowed in 75 cases before the State Public Utilities Commissions of Arizona, California, Colorado, Illinois, Indiana, Missouri, New Jersey, New York, First District, New York, Second District, Ohio, Oregon, Pennsylvania, Washington and Wisconsin.

9. Readiness-to-serve charges are in use in over 250 towns in the United States for electric, gas and water service.

DISCUSSION.

F. W. STONE: The "Readiness to Serve Charge" is distinctly a legal and an eingeering proposition. It seems to me that to a certain extent at least it is a local proposition, particularly with reference to the amount of the charge. The amount to be charged is something that must be determined locally. We must also take into consideration the fact that in making the charge we do not always fix what we want to make but merely what we can get and make the best bargain we can.

I think this paper might well have been discussed in connection with the paper that was presented by Mr. Emmerling particularly that portion relating to the supplying of gas for heating purposes in the winter time.

It seems to me if a readiness to serve charge is made, it would eliminate to a certain extent the objections raised in Mr. Emmerling's paper. If we eliminate the peak load consumption for house heating, we will not be able to do a profitable business. If we can use a readiness to serve charge we could eliminate the peak load consumption and still do a profitable business. It seems to me that would be one of the ways out of the difficulty which confronts us in this matter.

Also if this scheme advocated by Mr. Wyer of establishing a readiness to serve charge and then an increasing price in proportion to the amount of gas used that would automatically shut off the heating business when it become a peak load business. Whenever the business got to the point where the bills at the end of the month were very much higher the price of the pas would become so expensive that it would automatically reduce the consumption and that would be another way out of our difficulty and would help us out at least partially in the way of a solution of the peak load consumption.

We have a readiness to serve charge of 20 cents per month at Ashtabula established by the Public Utilities Commission of Ohio. I will say to you frankly that it is not enough but we got that much and probably we ought to be thankful for that, since it is a start in the right direction. An analysis of our accounts shows that it materially helps in equalizing the burden. That is, it materially helps in making the small consumer,—the very small consumer bear his portion of the burden. I refer to the fellow who uses only two or three thousand feet of gas per month. It makes him a profitable consumer or at least it makes him pay his proportion of the operating expenses where otherwise he would not pay his proper proportion.

In conclusion I may say that I am heartily in sympathy with the proposition as suggested by Mr. Wyer but I think the details would have to be worked out in every locality and in each particular case as the particular case might be affected by the local situation.

GEORGE S. GOFF: I am the General Manager of the Crystal City Gas Company, Corning, New York. We are before the Public Service Commission now with this same question. I do not know about the 20 cents suggested by Mr. Stone of Ashtabula. That is pretty light. We get 50 cents for our gas. We charge for 2,000 feet. From the figures we get by way of comparison we find that the 2,000 feet of gas as a minimum charge or a service charge seems to be all right. The Commission has absolute control over us and while we are asking for a little higher rate we not only can sell all the gas we have at 50 cents to domestic consumers but we can sell it for certain industrial purposes. That 20 cent charge made by the Company represented by Mr. Stone I think is too small. We get a dollar.

F. W. STONE: I think Mr. Goff must have misunderstood me. We have a 34 cent rate net and a 20 cent charge against every consumer in addition to that. No matter whether he uses any gas or not he pays 20 cents per month. I will say frankly that this 20 cents is not enough. We ought to have more but at the same time that was the charge that the Public Utililties Commission of Ohio allowed us whether we delivered any gas or not and of course inasmuch as that is all they

Saying is one thing doing another Montaigne

by the meter which is a much lower rate than gas could be purchased for in that district under any other circumstances. We are convinced that the application of this rate in our district will result: First, in a vast improvement in the just and fair distribution of the cost of gas service between various classes of consumers; Second, that it will lighten the most burdensome feature of paying for natural gas, i. e., the extreme high winter bills; Third, it will produce a more satisfactory revenue to the gas company; Fourth, it will make absolutely definite the amount of maximum winter demand which the company should be prepared to meet.

I quote from the printed report of the committee of the Chamber of Commerce, the summary giving the problems which the committee found and the conditions to be met, followed by the details of the plan proposed to meet these conditions as follows:

(Page numbers refer to pages in report which give the detail of the finding or recommendation).

1. Without radical measures, no relief in the gas situation can be looked for next winter. (Pages 14-15-16-17-18).

2. The Kansas City Gas Company cannot supply artificial gas in time to be of assistance next winter (Page 21).

3. The natural gas fields are giving out, and the time is coming—it may be three years or it may be twenty—when there will be no available natural gas for Kansas City (Pages 15-17-18).

4. The gas problem is now involved in legal technicalities which can be eliminated if all parties interested will co-operate. (Page 15).

5. The Kansas City Gas Company is a distributing company only, and is obligated to supply only such gas as is delivered to it by the producing companies. (Page 16).

6. There are five leading natural gas companies connected with the system which supplies Kansas City. They are all controlled, however, by the Cities Service Company, a holding company, of which Henry L. Doherty & Company are the principal owners. (Page 16).

7. Kansas City's present normal consumption of natural gas varies from fifteen million to twenty-five million cubic feet per day. The average daily delivery of gas in December, 1917, was 7,331,000 cubic feet, and in January, 1918, 6,045,000. (Page 17).

8. The normal consumption of artificial gas in other cities would indicate that Kansas City's consumption for cooking and lighting purposes only on artificial gas basis would be not to exceed an average of seven million cubic feet per day. This would provide a liberal allowance for Kansas City's previous experience with large users of gas and lower rates. There is sufficient natural gas at present to supply the next winter's demands if the use in Kansas City is somewhat restricted (Pages 19-20-21).

9. The only workable way of restricting the use is to increase the price (Pages 19-22).

10. By the winter of 1919-1920, a supplementary artificial supply can be made available (Pages 22-23-27).

11. To increase the supply of natural gas, the Doherty interests made improvements costing approximately two and one-half million dollars during the winter of 1917-1918. Since February 10th, when these were complete, the supply in Kansas City has increased from three to four times what it was during December and January (Pages 17-18-19-21).

12. Conditions of labor, supplies and money are such now that the natural gas companies are unable to make further expenditures by securing additional capital. Therefore, when improvements now under way are completed, work will be stopped unless earnings are sufficient to make further betterments (Pages 14-22).

13. The problem of supplying gas is one which must be looked at in the light of a permanent future supply. This means that we must plan on both natural and artificial gas (Pages 15-18-22-23-24).

14. The following plan has been worked out as one which will give a permanent solution of the gas question: (Pages 22-23-24-25):

(a) Depend on natural gas supply for the coming winter with a temporary rate which will restrict the use so as to make the supply adequate. Such rate should be a $6.00 per annum customer's charge, plus 80 cents per 1,000 cubic feet for the natural gas consumed.

(b) To increase the supply of natural gas, the natural gas company to use a portion of its earnings toward new extensions.

(c) The Doherty interests to commence at once, on the reaching of an agreement, to install at various points along the pipe lines and near coal fields, various chemical plants, of which artificial gas will be a by-product.

(d) The Doherty interests also to secure the establishment of a coke oven plant in or near Kansas City, with a capacity of ten million cubic feet of gas per day as a by-product. This is a contingent on the ability to secure the location of such a plant here.

(e) All earnings to be applied to improving the gas supply, both natural and artificial. The increased revenue due to increased charges is to be applied only to taking care of increased costs due to the war. None of these costs to be considered as capital expenditures on which earnings will be expected. This means that instead of building at present high prices and making consumers pay for these high prices for years to come, they will be taken care of immediately out of the increased charge and the plants built and capitalized on the normal cost basis.

(f) Prices shall be fixed for permanent artificial and natural gas which will be determined in a scientific way and which shall be very low (For details, see pages 25-26).

(g) All cities on the pipe lines are to be included in the plan (Page 28).

15. The city of Kansas City has no power at present to purchase or build a gas plant, because of lack of ability to get money. This also puts the city in a weak position in its dealings with the companies (Page 30).

Difficulties are things that show what men are.—Epictetus.

Saying is one thing doing another Montaigne

consumer carries. Therefore, the "readiness to serve" charge is proven to be a fair method of distributing the load. The amount of gas delivered is adjusted by the meters so that the exact amount contracted for is the maximum which can flow through the meter in any given period.

Table III, herewith, shows the cost of gas under the 60-cent rate, under the proposed temporary rate, under the proposed permanent natural gas rate, and the proposed permanent artificial gas rate, together with a percentage table, setting out clearly, costs in various quantities of consumption.

Artificial gas on the same basis as natural gas requires about forty per cent. more volume to attain the same number of heat units, as the manufactured standard is 572 B. T. U.s per cubic foot and natural gas has 1,000 B.T.U.s per cubic foot.

Under the plan proposed in this report the rate of 40 cents for artificial gas contemplates furnishing manufactured gas of 1,000 B.T.U.s per cubic foot or in other words, on the same basis as natural gas.

This is believed to be the lowest net rate for artificial gas offered in any city in the United States.

Under the plan illustrated all consumers would be on a par in carrying a share of the overhead burden in proportion to their individual requirements for service, and would pay for gas consumed at a minimum rate, because they would not be carrying a part of the burden of the customer who was not paying his just share of the overhead and carrying charges.

It will be seen from this table that on the proposed temporary rate the largest percentage of increase is on the smallest consumption, and that the increase grows smaller as the amount purchased grows larger.

For the proposed permanent rate for natural gas, there is an increase only up to 2,000 cubic feet. On amounts above this the charge is a decrease below the present rate of 60 cents until on an amount of 25,000 cubic feet there is a decrease of 38 per cent. in the total rate. In the proposed permanent rate for artificial gas there is an increase on all amounts below 5,000 cubic feet as given in the table, and a decrease on amounts of 100,000 and above.

These various rates as given show that on the permanent gas rates which are to be established as soon as possible, if gas is purchased in quantities sufficiently large to provide for heating, it will be purchaseable at a lower cost than at present. For the very smallest consumer, whose present bill is not now more than 60 cents, there will be a large increase in the price. For the consumer who is consuming about 3,000 cubic feet or whose present bill is now $1.80, there will be a decrease on a permanent natural gas rate, and a slight increase on the permanent artificial gas rate."

DONALD McDONALD: The principle of the readiness to serve charge is undoubtedly an absolutely fair one but the plan of installing a check on the meter which will only allow a certain consumption per hour will not accomplish all that ought to be accomplished. If a man can burn ten feet or we will say thirty feet an hour and keeps that consumption up for twenty-four hours a day for the period of a year, when you have not enough gas for everybody he does just as much harm to the Company and puts just a great a burden on it as if he burned three times as much for one-third of the time. A readiness to serve charge on electrical apparatus is a matter of seconds. A readiness to serve charge in a gas company plant is a matter of hours and more likely of days. In adjusting a readiness to serve charge it ought to be calculated so as not to put on the poor man and on the small consumer any greater burden than is actually occasioned to the company by standing ready to meet that man's wants. His consumption is fairly uniform. He does not put any much greater burden on the Company's service in the winter time than he does in the summer. But when you come to the heating of houses and especially the heating of large

TABLE III.

PRESENT AND PROPOSED RATES FOR GAS IN KANSAS CITY.

	Present Rate	Proposed Temporary Natural Gas Rate*			Proposed Permanent Natural Gas Rate**			Proposed Permanent Artificial Gas Rate***			
Consumption Cubic Feet per Month	Monthly Bill (60c per 1,000 Cubic Feet)	Monthly Bill	Gas Cost per 1,000 Cubic Feet	Per Cent. Increase or Decrease from Present	Monthly Bill	Gas Cost per 1,000 Cubic Feet	Per Cent. Increase or Decrease from Present (b)	Monthly Bill	Gas Cost per 1,000 Cubic Feet	Per Cent. Increase or Decrease from Present (b)	Hourly Demand in Cubic Feet on which these prices are Based
1,000	$0.60	$1.30	$1.30	$1.17	$1.07	$1.06 2-3	78	$1.32	$1.31 2-3	120	10
1,500	.90	1.70	1.13 1-3	.88	1.21	.81	35	1.52	1.01	68	10
2,000	1.20	2.10	1.05	.75	1.37	.68	14	1.72	.86	43	10
3,000	1.80	2.90	.96 2-3	.62	1.67	.56	7	2.12	.71	18	10
4,000	2.40	3.70	.92 ½	.54	1.97	.49	18	2.52	.63	5	10
5,000	3.00	4.50	.90	.50	2.40	.48	20	3.13	.62	3	15
10,000	6.00	8.50	.85	.42	4.03	.40	33	5.33	.53	12	20
20,000	12.00	16.50	.82 ½	.38	7.57	.38	37	10.17	.51	15	40
25,000	15.00	20.50	.82	.37	9.33	.37	38	12.55	.50	17	50

* $6.00 per year customer charge; 80c per 1,000 cubic feet of gas.

** $6.00 per year customer charge; 32c per year per foot per hour maximum demand charge; 30c per thousand cubic feet of gas.

*** $6.00 per year customer charge; 50c per year per foot per hour maximum demand charge; 40c per thousand cubic feet of gas.

(a) These apply to the permanent rates only.

(b) Black face type indicates decrease.

Men at some times are masters of their fates.—Shakespeare.

He who lacks strength must attain his purpose by skill Scott

than at any other time has to pay a premium for the extra expense to which he puts you in the form of a demand charge and he will find ways to limit himself in the consumption of gas and in the demand for service at the time which hits your supply the hardest, namely, your peak hours of nine o'clock in the morning and five thirty in the afternoon.

F. W. STONE: In connection with what has been said by some of the speakers, we would judge from the record as given, that the rich man was the fellow who uses the gas and that he was the big consumer and the poor man uses a very small amount of gas. In other words the amount of gas a man uses to a certain extent is proportionate to his income. While we generally have that impression the facts do not bear out a state- of the accounts of two Gas Companies, one in a manument of that kind. I had occasion to make an analysis facturing town of about eight or nine thousand people where they had 2,600 accounts on their books,—a western Pennsylvania town doing the ordinary business that a western Pennsylvania town does, and another town of 25,000 people where they had 6,000 accounts on their books. We had occasion to go back over the ledgers and find out the income of one out of every five customers just taking the ledger as the names of the customers appeared upon it so that we would get an average of about the financial situation of the customers as they appeared upon the ledger. The facts of the case are as disclosed by that analysis that the rich man was not the man who used the most gas. The fact of the matter is that the very poor man and the very rich man use about the same amount of gas. We figured it out this way. That the very rich man had plenty of help in his house and he thought if it did not cost him any more to have his furnace fired and it was not any burden on him but that the man who did the chores around the house or a maid or whoever did the rough work about the house they could shovel in the coal and carry out the ashes and it did not entail any extra work to him and the consequence was that he burned the coal for heating his mansion and he used electric light for lighting it and he used gas for just whatever cooking was necessary and that was about the limit of his consumption on the average. The very poor man used gas for cooking and used coal for heating because he felt that the coal would be cheaper and he could get along that way. We found an analysis of these accounts that the best customer of the Gas Company and the man who used the most gas was the thrifty and well to do mechanic. The fellow who was making good wages and had a very good income but whose wife did her own work and in order to make it easy for the wife to do the work he would use gas for cooking and lighting and heating and for everything around the house where it was possible to use gas and that he was the fellow who was really the big consumer of gas. So that all of this talk has been indulged in here this morning about the man heating his mansion being the big consumer of gas is not borne out by the facts at least so far as our experience goes.

H. C. MORRIS: An analysis of the gas sales in a town of 135,000 indicated that 70 per cent of the customers only used 30 per cent of the gas and that the remaining 30 per cent of the customers used 70 per cent of the gas. That is domestic consumption only.

NEW GAS AND OIL ASSOCIATIONS.

ON Wednesday, July 10th, at a meeting held at the Chittenden Hotel in Columbus, the preliminary steps were taken towards the formation of The Ohio Gas & Oil Men's Association, intended ultimately to embrace in its membership every man directly or indirectly engaged in the gas or oil industry in Ohio.

The Secretary—Mr. William H. Thompson, for many years associated with the Ohio Fuel Supply Company as attorney, and who is thoroughly experienced in every branch of the industry, will devote his entire time to the work of the Association, and within the next two or three weeks will open Association offices in Columbus and establish permanent headquarters here.

OFFICERS AND DIRECTORS ELECTED:

President—Hon. L. G. Neely.....St. Marys, Ohio
Vice-President—H. J. Hoover.....Cincinnati, Ohio
Vice-President—F. O. Levering....Mt. Vernon. Ohio
Secretary-Treasurer—Wm. H. Thompson.....
.....Box 1192, Columbus, Ohio

DIRECTORS.

Three Years.

J. M. Garard .....Columbus, Ohio
James McMahon .....Toledo, Ohio
A. F. Holliday .....Newark, Ohio
Geo. W. Trimble.....Lancaster, Ohio

Two Years.

Kay C. Krick .....Columbus, Ohio
C. W. Sears .....Wooster. Ohio
Geo.H. Mauntler .....Woodville, Ohio
J. J. Crawford .....Toronto, Ohio

One Year.

M. B. Daly .....Cleveland, Ohio
Hon. James E. Campbell.....Columbus, Ohio
W. E. Sykes .....Marietta, Ohio
W. H. Lear .....Woodsfield, Ohio

BECOMES PURCHASING AGENT.

ON July 1st, Mr. James McK. Reiley who was at one time connected with THE GAS INDUSTRY magazine and THE NATURAL GAS JOURNAL, succeeded Mr. B. G. Grammel as Purchasing Agent of the Iroquois Natural Gas Company of Buffalo.

Mr. Reiley some while since took charge of the appliance exhibition room of the Iroquois Company, since which time this exhibit has been continuously maintained as a "live exhibit." It has proved a marked success.

The conduct of the appliance exhibit section continues under Mr. Reiley's supervision as formerly, thus he will now perform a dual service on the staff of the Iroquois Company.

Mr. Reiley's youngest son has sailed for France as Captain of a machine gun company.

One foolish act may undo a man, and a timely one make his fortune.—Chesterfield.

Power By Gas

Complete Gas Engine Installation in an Unusual Glass Factory

WE wish to call particular attention to the accompanying illustration, which shows an interior view of the power plant of The Libbey-Owens Sheet Glass Company, Charleston, W. Va.

It will be of special interest to our readers to know that we are informed that this is conceded to be the finest gas engine power plant in the entire country, from the standpoint of machinery and equipment used, as well as in the manner in which it is installed.

The main power units consist of three 25x36-in. stroke Horizontal Single Tandem Cooper Gas Engines, each direct-driving a 480 K. V. A., 60 cycle, 3 phase, 440 volt, alternating current Generator, General Electric Company's make, all of which operate in parallel.

The plant supplies current for the new window glass factory of The Libbey-Owens Sheet Glass Company. This factory is also worthy of special mention, as it marks a revolution throughout the world. The factory consists of six glass tanks. In front of each tank is a machine which draws the glass from the tank in a flat sheet. We understand this to be the only sheet window glass machine ever developed to the point of successful and practical operation.

The factory and power-house-buildings are of modern steel and pressed brick construction, beautiful in architectural design and finish, and we believe we are safe in saying it is one of the finest glass factories in the world today.

COOPER ENGINES INSTALLED AT THE LIBBEY-OWENS SHEET GLASS COMPANY.

NOW LIEUT. COLONEL.

MR. H. M. BYLLESBY, at the head of the widely known H. M. Byllesby & Company, engineering and operating corporation, became a Major in the United States service, aviation division.

For some time Major Byllesby was located in Washington, having exceedingly important duties to perform in connection with military administration matters. We are glad to have the privilege of stating that "Major" Byllesby is now Lieutenant-Colonel Byllesby, doing special duty abroad.

He is no wise man that will quit a certainty for an uncertainty. Johnson.

RESULTS OF DRILLING---LATEST REPORTS

PENNSYLVANIA FIELD.

ALLEGANY FIELD.

Carpenter & Co., Potter Gas	Gas
Wheeler heirs, A. L. Shaner	Gas
Ballard, E. G. & F.	Gas
Gas Wells	3

MIDDLE FIELD.

Lot 3190, Dr. Kitchen 2	Dry
McKean, Haskell & Co. 18	Gas
McKean, Haskell & Co. 19	Gas
Schreiber, Continental Oil 5	Dry
Isenbrown, Proper & Co. 3	Dry
Siggins, G. B. Siggins 12	Gas
Wilson, Clinger Oil 6	Gas
Johnson, Triumph Oil 22	Gas
Wallace, Clinger Oil 7	Gas
Carson, R. O. Carson 15	Dry
Dry	4
Gas Wells	6

BRADFORD FIELD.

Kinney, Berwald & Lester 1	Dry
A. Batton, S. Newell	Dry
Dry	2

VENANGO-CLARION.

Pithole Oil, Tague & Troutman 2	Dry
Pithole Oil, Tague & Troutman 3	Dry
F. G. Albaugh, S. P. McCalmont est. 14	Dry
A. F. Korb, Kapp, Korb & Beary 14	Dry
Strong & Brown, Chambers Oil 45	Dry
Joe Kaverline, Kaverline 1	Dry
Shoch, Grieff & Smith 2	Dry
John Lushen, Ballen Dally et al. 7	Dry
Clarion—	
Paul Black, F. G. Yonkers 6	Dry
Dry	9

BUTLER-ARMSTRONG

Wm. Foringer, Knight, Moody et al. 2	Dry
Dry	1

SOUTHWEST PENNSYLVANIA.

Washington—	
Greenlee, Mfrs. L. & H. 1	Gas
Swart, Mfrs. L. & H. 1	Gas
Bane, Peoples Gas 1	Gas
Bell, Peoples Gas 7	Gas
Custer, Lew Mills & Co. 1	Dry
Imperial—	
Meanor, Gladys Oil 2	Dry
Steinetz, Jones & Co. 1	Gas
Dorseyville—	
Kretzer, Wildwood Oil 1	Dry
Crystal, Burke & Co. 1	Gas
Hartz heirs, American N. G. 1	Gas
Pegher heirs, National O. & G. 1	Dry
Ingomar—	
Irwin, J. T. Williams 2	Gas
Duff City—	
Neeley heirs, Neeley Bros. & Co. 1	Gas
Purvador, Harbison & Co. 1	Dry
Crafton—	
Beales, Yolton & Co. 2	Gas
Bellevue—	
Wilson, Philadelphia Gas 2	Dry
Beaver County—	
Breadin heirs, Crown Petroleum 3	Dr
Davidson, L. R. Davidson 14	Dry
Mt. Morris—	
Keener, J. L. Garard 8	Dry
Thomas lot, J. L. Garard 3	Dry
Garrison, Peoples Gas 4	Gas
White, Peoples Gas 1	Gas
Carpenter, Peoples Gas 1	Gas
Jones, Peoples Gas 1	Gas
Keffer, Carnegie Gas 3	Gas
Garrison, Peoples Gas 4	Gas
King, Mfrs. L. & H. 1	Gas
Dry	16
Gas	17

WEST VIRGINIA.

Mannington—	
Neeley, Reserve Gas 1	Dry
Taylor, Hope Gas 2	Gas
Davis, Reserve Gas 1	Gas
Hawkins, South Penn Oil 3	Gas
Springer, Carnegie Gas 2	Gas
Stewart, South Penn Oil 2	Dry
Kinsey, Hope Gas 4	Dry
Cole, Carnegie Gas 1	Dry
Dawson, Hope Gas 3	Gas
Maxwell, Philadelphia Co. 4	Gas
Smith, Hope Gas 2	Gas
Clark hrs., Philadelphia Co. 1	Gas
Cordray, South Penn Oil 1	Gas
Wells, Carnegie Gas 2	Ga
Spencer, A. O. D. 3	Dry
Keyser, Hope Gas 2	Dry
Moore, Hope Gas 3	Gas
Wilson, Hope Gas 3	Gas
Park, Hope Gas 1	Gas
Fordyce, South Penn Oil 2	Gas
Wilson, Philadelphia Co. 1	Dry
Wetzel and Tyler—	
Hart, Carnegie Gas 1	Gas
Roberts hrs., Hope Gas 3	Gas
Postalwaite, Hope Gas 1	Gas
Davis, Eastern Petroleum 1	Gas
Cook, Benedum-Trees Oil 1	Dry
Hancock County—	
Heilman, Heilman & Co. 1	Dry
Wood County—	
Bell, B. B. Bell 1	Dry
Ritchie County—	
W. Va. tract, Burke Bros. 19	Dry
Rush, Hope Gas 1	Gas
Keith, R. E. L. Frymier 1	Gas
Hays, Hope Gas 1	Gas
Brannon, South Penn Oil 5	Gas
Mason, Carnegie Gas 1	Dry
Dotson, Philadelphia Co. 1	Gas
Haught, Ira Haught 1	Gas
Wirt County—	
Adams, Krepps & Co. 1	Dry
Pleasants County—	
Tait, Tait Farm Oil 4	Dry
Smith, F. M. Gardner & Co. 1	Dry
Barron lot, Wright & Co. 1	Dry
Gilmore, Newilmington O. & G. 1	Dry
Hammett, Hope Gas 7	Dry

Ingenuity is genius in trifles.—Johnson.

Calhoun County—
Haverty, Martin Crawley 1 ..... Dry
Devore, Federal Oil 5 ..... Dry
Kanawha County—
Sunday Creek Coal, U. F. G. 9..... Gas
Sunday Creek Coal, U. F. G. 10 ..... Gas
Thomas, Cabot & Thomas 1 ..... Gas

Dry 20
Gas 27

SOUTHEASTERN OHIO.

Woodsfield—
Smith, Big Ben Oil 1 ..... Dry
Draper, Sylvan Oil 1 ..... Gas
Hamilton heirs, O. F. S. 1 ..... Gas
Braysville—
Kinsey, Gatton & Dye 4 ..... Dry
Perry County—
Green, Sturm & Co. 1 ..... Dry
Buckley, Drumbottom Oil 1 ..... Dry
Schmeltzer, Carter Oil 1 ..... Dry
Hocking County—
Trobridge, Preston Oil 1 ..... Dry
Longstreth, Preston Oil 12 ..... Dry
McClain, Lupher Producing 2 ..... Dry
Coshocton County—
Hamilton Rico Oil 1 ..... Dry
Athens County—
Rice, L. Stephens 1 ..... Dry
Totman, Citizens National Bank 2..... Dry
Morgan County—
Van Fossen, Pittsburgh Oil 1 ..... Dry
Best, Henne Oil 11 ..... Dry
Crew, Davis & Turney 6 ..... Dry
Dale, A. G. Smith 234 ..... Dry
Noble County—
Archer, M. B. Archer & Co. 1 ..... Dry
Archer, M. B. Archer & Co. 2 ..... Dry
Hohman, Felix Gerst & Co. 1 ..... Dry
Jerles, Velda Oil 3 ..... Dry
Blake, J. W. McKee 1 ..... Dry
Banker, A. L. Patton & Co. 1 ..... Dry
Marietta—
Reader, William Reader 24 ..... Dry
Allen, Carter Oil 1 ..... Dry
Knowlton, J. C. Grant & Co. 1..... Gas
Harris, Earl Stephens 1 ..... Dry
Soles, Beaver Valley Dev. 1 ..... Dry
Carroll County—
Long, Holmes & Co. 1 ..... Dry
Harrison County—
McCauley, W. C. Kennedy Co. 1 ..... Dry
Armstrong, Liberty O. & G. 1..... Gas
Crawford, Archer Dev. Co. 3 ..... Dry
Jefferson County—
Mills, F. Housen 2 ..... Dry
Columbiana County—
Christie, Renner-Deibel O. & G. 2 ..... Dry

Dry 30
Gas 4

PENNSYLVANIA FIELDS.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry	Gas
Allegany	20	33	0	3
Bradford	49	131	2	0
Middle Field	28	30	4	6
Venango-Clarion	49	63	9	0
Butler-Armstrong	11	21	1	0
S. W. Penn'a.	45	72	10	0
West Virginia	109	670	20	27
S. E. Ohio	109	1,165	30	4
Total	420	2,185	76	40

CENTRAL OHIO.

LICKING COUNTY.

Granville—J. Jones, Heisey Gas 1..... Gas
Licking—A. A. Haines, Wehrle Stove 3..... Gas
Liberty—S. C. Montgomery, Ohio F. S. 1..... Dry
A. Horn, Ohio Fuel Supply 1 ..... Dry

Dry 2
Gas 2

FAIRFIELD COUNTY.

Walnut—J. H. Grubb, Ohio Fuel Supply 1 ..... Dry

KNOX COUNAY.

Jefferson—A. J. Workman, Ohio F. S. 1..... Gas

ASHLAND COUNTY.

Hanover—Atkinson, Ohio Fuel Supply 1 ..... Gas

MEDINA COUNTY.

Leitchfield—Heiserman, Hartman & Co. 1..... Dry
A. J. Holmes, Jas. Hartman & Co. 3..... Dry
Westfield—A. Mong, Ohio Fuel Supply 1 ..... Gas
Brunswick—Carpenter, Ohio Fuel Sup. 2 ..... Gas
Liverpool—P. Emet, Ohio Fuel Supply 1 ..... Gas
Medina—L. A. Miner, Ohio Fuel Supply 1..... Dry

Dry 3
Gas 3

WAYNE COUNTY.

Cannan—V. & C. Bowman, Logan Gas & Fuel 1.... Gas
C. C. Pinkley, Logan Gas & Fuel 1 ..... Dry
J. & E. Sell, Logan Gas & Fuel 1 ..... Gas
C. S. Oller, Ohio Fuel Supply 1 ..... Dry
Wm. Weidrick, Ohio Fuel Supply 2 ..... Gas
T. Armstrong, Ohio Fuel Supply 1 ..... Gas
Plain—Silas Ficks, East Ohio Gas 1 ..... Gas
Chippewa—F. W. Galehouse, East O. G. 2..... Gas

Dry 2
Gas 6

RICHLAND COUNTY.

Monroe—J. A. Irvine, Logan Gas & F. 1..... Gas
C. E. Shearer, Logan Gas & Fuel 2 ..... Gas
Worthington—Smith-Creedy, Logan G. & Fuel 1.... Gas

Gas 3

CUYAHOGA COUNTY.

Dover—A. V. Coone, Logan Gas & F. 1..... Gas
H. Myers, Logan Gas & Fuel 2 ..... Gas
Mary E. Wulf, Logan Gas & Fuel 3..... Gas
C. R. La Salle, Breston Oil 1 ..... Gas
Bailey-Lewis, Melrose Oil & Gas 2..... Dry
J. Kirk, Melrose Oil & Gas 2 ..... Gas
C. L. Mogawar, East Ohio Gas 1..... Gas
C. M. Lippert, East Ohio Gas 1..... Dry
J. W. Clemens, East Ohio Gas 1..... Gas
Victor Tuttle, East Ohio Gas 1..... Dry

Dry 3
Gas 7

VINTON COUNTY.

Richland—Cath. R. Poling, Ohio F. S. 9..... Gas
Jas. Stone, Ohio Fuel Supply 3 ..... Gas
Chas. Nickles, Ohio Fuel Supply 1 ..... Gas
W. R. Ratcliff, Ohio Fuel Supply 1 ..... Gas

Speech is the gift of all, but thought of few.—Cato.

S. M. Waltz, Ohio Fuel Supply 2 ..... Gas
Harrison—Thatcher, Ohio Fuel Supply 3..... Gas
Elk—I. M. Lautz, Ohio Fuel Sup. 2..... Gas
Jno. Clark, Ohio Fuel Supply 1..... Gas
Eagle—S. Hysel, Ohio Fuel Supply 1..... Dry

Dry 1
Gas 8

PERRY COUNTY.

Thorn—J. & E. Bope, Logan G. & F. 4..... Gas
H. Crossmark, Heisey Gas 1..... Dry
D. Foster, Heisey Gas 1..... Gas

Dry 1
Gas 2

HOCKING COUNTY.

Salt Creek—U. & A. Shappell, Logan Gas & Fuel 1.. Dry
J. J. Brown, Ohio Fuel Supply 1 ..... Dry
Benton—Huffman, Ohio Fuel Supply 1..... Dry

Dry 3

HOLMES COUNTY.

Ripley—V. V. Denny, Ohio Fuel Supply 1..... Dry
Jas. Dye, East Ohio Gas 1..... Gas
Washington—P. Sprang, Logan G. & F. 1..... Gas
Houdenschild, Logan Gas & Fuel 1 ..... Dry
J. H. Doty, Ohio Fuel Supply 1 ..... Gas
Amanda Graven, Ohio Fuel Supply 1 ..... Gas

Dry 2
Gas 4

JACKSON COUNTY.

Coal—S. Bingham, Ohio Fuel Supply 1 ..... Gas

CENTRAL OHIO FIELD.

SUMMARY OF COMPLEIED WORK.

	Comp.	Prod.	Dry	Gas
Licking	4	0	2	2
Fairfield	1	0	1	0
Knox	1	0	0	1
Ashland	1	0	0	1
Medina	7	5	3	3
Lorain	0	0	0	0
Wayne	10	18	2	6
Richland	3	0	0	3
Cuyahoga	10	0	3	7
Vinton	9	0	1	8
Perry	3	0	1	2
Hocking	3	0	3	0
Holmes	7	50	2	4
Coshocton	1	50	0	0
Jackson	1	0	0	1
Total	61	123	18	38

LIMA FIELD.

WOOD COUNTY.

Bloom—N. W. Gas 17, Ohio Oil 46 ..... Dry
Troy—Englehart, J. E. Englehart 1 ..... Gas

Dry 1
Gas 1

AUGLAIZE COUNTY.

St. Marys—C. J. Haeseker, Ohio Oil 8 ..... Dry
Gust Evons, W. V. Young 1..... Dry

Dry 2

VAN WERT COUNTY.

Willshire—Z. Bowen, E. J. Wheeler 1, 2..... Dry

SENECA COUNTY.

Clinton—N. J. Nelkirk, Barhoff & Co. 1..... Dry
Wm. Einsel, the Sun Co. 17..... Dry

Dry 2

LUCAS COUNTY.

Waterville—R. G. Stitt, R. G. Stitt 7 ..... Dry

WYANDOT COUNTY.

Salem—Enders, M. H. Hauser & Co. 2..... Dry

LIMA FIELD.

SUMMARY OF COMPLETED WORK.

	May, '18.			April, '18		
	Comp.	Prod.	Dry	Comp.	Prod.	Dry
Wood	10	87	2	9	60	1
Hancock	4	48	0	5	30	0
Allen	5	60	0	2	20	0
Auglaize	8	32	2	3	6	0
Sandusky	8	38	0	3	30	0
Mercer	3	28	0	3	36	0
Van Wert	8	45	2	1	10	0
Seneca	4	115	2	2	165	0
Lucas	2	1	1	0	0	0
Ottawa	6	76	0	4	30	0
Wyandot	1	0	1	0	0	0
Williams	0	0	0	1	0	1
Defiance	0	0	0	1	2	0
Total	59	530	10	34	389	2

INDIANA FIELD.

JAY COUNTY.

Penn—Jas. Sutton, Jones & Lyons 6 ..... Dry

DELAWARE COUNTY.

Liberty—J. Hitchcock, Oklahoma-Southern Oil 3... Dry
Delaware—M. M. Friddle, Roberts & Co. 3..... Dry

Dry 2

PIKE COUNTY.

Madison—W. J. Rapp, Ohio Oil 1 ..... Dry
Eli Rumble hrs., M. Murphy estate 1 ..... Dry
Eliza D. Tame, M. Murphy estate 5 ..... Dry
Geo. W. Willis, A. B. Bement 1 ..... Dry

Dry 4

SULLIVAN COUNTY.

Turman—W. C. Riggs, Scott & Co. 2..... Dry
Gill—M. Berry, Indiana-Illinois Oil 1..... Dry
Curry—F. Dix, W. C. Kennedy Co. 6..... Dry

Dry 3

INDIANA FIELD.

SUMMARY OF COMPLETED WORK.

	May, '18.			April, '18		
	Comp.	Prod.	Dry	Comp.	Prod.	Dry
Wells	0	0	0	1	0	1
Jay	1	0	1	3	85	1
Huntington	3	9	0	0	0	0
Delaware	2	0	2	0	0	0
Randolph	1	25	0	0	0	0
Gibson	0	0	0	3	20	2
Pike	8	266	4	7	295	1
Sullivan	3	0	3	4	6	2
Allen	1	4	0	0	0	0
Total	19	304	10	18	406	7

It takes a long time to bring excellence to maturity. Syrus.

KENTUCKY-TENNESSEE.

WAYNE COUNTY.

Lee Baker, Jas. Walker & Co. 1 ..... Dry

WOLFE COUNTY.

Torrent—Davis, Meadow Creek O. & G. 1 ..... Dry

ESTILL COUNTY.

Irvine—Cox hrs., A. M. Pague & Co. 2 ..... Dry
E. Stacy, New York-Ky. Oil 4 ..... Dry
Williams, Brode, Reis & Holden 1 ..... Dry
Callon Cox, Harris & Co. 1 ..... Dry
Chas. Cox hrs., A. M. Pague & Co. 3 ..... Dry

Dry 5

POWELL COUNTY.

Pilot—J. D. Huff, Ohio Oil 1 ..... Dry
Geo. Woodward, O. K. Oil 2 ..... Dry
Elias Bishop, Federal Oil 15 ..... Dry
W. R. Sparks, Ohio Oil 4 ..... Dry
Widow Amburgy, J. D. Drake 2 ..... Dry

Dry 5

LEE COUNTY.

Beattyville—Kincaid hrs., Combination Oil 1 ..... Dry
A. H. Warner, California Pet. 1 ..... Gas
A. H. Warner, California Pet. 2 ..... Dry
A. H. Warner, California Pet. 3 ..... Dry

Dry 3
Gas 1

ALLEN COUNTY.

Scottsville—Riley Hunt, Smith & Morrison 1 ..... Gas
C. J. Harmon, C. A. Rose 1 ..... Dry

Dry 1
Gas 1

BATH COUNTY.

Licking Union—Crosswait, Kentucky Crude Oil 1 .. Dry

LINCOLN COUNTY.

Waynesburg—Dunningan, Florence Oil 1 ..... Gas
Turpman, Owen & Neal 1. ..... Dry

Dry 1
Gas 1

KNOX COUNTY.

Barbourville—S. H. Jones, Ohio Oil 1 ..... Dry
S. B. Dishman, Empire O. & G. 1 ..... Dry
Pursifield, Empire O. & G. 1 ..... Dry

Dry 3

JOHNSON COUNTY.

Paintsville—Paint Lick Dome, Paint Lick Dev. 1 .... Dry

ROWAN COUNTY.

Long Tunnel—Clearfield Lumber, Kentucky Crude Oil 1 ..... Dry

GRAYSON COUNTY.

Leitchfield—John Dunn, C. H. Dooley 1 ..... Dry

TAYLOR COUNTY.

Campbellsville—Grayson County O. & G. 7 ..... Gas

ELLIOTT COUNTY.

Isonville—Fulton, Ohio Cities Gas 1 ..... Dry
Burkes—Gillam, Badger Oil 1 ..... Dry

Dry 2

EDMONSON COUNTY.

Asphalt—Asphalt Tract, Southwestern Dev. 1 ..... Dry

KENTUCKY-TENNESSEE.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry	Gas
Wayne	4	10	1	0
Wolfe	5	50	1	0
Lawrence	1	4	0	0
Morgan	1	5	0	0
Estill	44	325	5	0
Powell	39	306	5	0
Lee	42	1,090	3	1
Allen	11	176	1	1
Bath	1	0	1	0
Warren	1	5	0	0
Metcalf	1	5	0	0
Lincoln	7	25	1	1
Knox	4	5	3	3
Johnson	1	0	1	0
Rowan	1	0	1	0
Owsley	1	10	0	4
Grayson	1	0	1	0
Taylor	1	0	0	1
Elliott	3	5	2	0
Edmonson	1	0	1	0
Union	1	10	0	0
Total	171	2,031	27	7

ILLINOIS FIELD.

CLARK COUNTY.

Parker—N. P. Doughtree, Ohio Oil 27 ..... Dry
Westfield—M. L. Briscoe, Briscoe Oil 8 ..... Dry

Dry 2

CRAWFORD COUNTY.

Oblong—G. W. Davis, Ohio Oil ..... Dry
Prairie—M. Newlin, Watson & Co. 1 ..... Gas
O. Newlin, Pease Oil 1 ..... Dry
Montgomery—Parker, S. Y. Ramage 10 ..... Dry
Honey Creek—Maxwell, John McNally 13 ..... Dry
J. F. Rich, Pease Oil 1 ..... Gas

Dry 4
Gas 2

JASPER COUNTY.

Grandville—C. Shook, Central Refining 3 ..... Dry

COLES COUNTY.

East Oakland—Sam Doughtree, Woman's Federal Oil 1 ..... Gas

ILLINOIS FIELD.

SUMMARY OF COMPLETED WORK.

	May, '18.			April, '18		
	Comp.	Prod.	Dry	Comp.	Prod.	Dry
Clark	6	19	2	7	72	1
Crawford	18	195	6	13	84	5
Lawrence	3	235	0	7	216	2
Clinton	0	0	0	2	3	1
Wabash	1	5	0	3	0	3
Jasper	1	0	1	0	0	0
Coles	1	0	1	0	0	0
McDonough	0	0	0	1	3	0
Total	30	454	10	38	373	12

KANSAS.

12-26- 4, Enyart, Paragon Oil 15 ..... Dry
35-25- 4, Adsit, Empire G. & F. 10 ..... Dry
36-25- 4, Houston, Empire G. & F. 25 ..... Dry

'Tis a wise saying, Drive on your own track.—Plutarch.

20-26- 5, Kinney, Leonard Oil 2 ..... Dry
35-26- 5, Bisagno, Mid-Kansas Oil 1 ..... Dry
31-26- 6, Unger, Big Four Oil 1 ..... Dry
28-26- 5, Lane, Crown Rock Oil 1 ..... Dry
28-26- 5, Lane, Gore et al. 1 ..... Dry
34-25- 4, Dillenbeck, Southwestern Pet. 1 ..... Dry
3-25- 5, Robinson, Theta Oil 15 ..... Dry
2-25- 5, Guinn, Gypsy Oil 2 ..... Dry
26-25- 4, Harden, Empire G. & F. 1 ..... Dry
34-25- 4, Dillenbeck Tuloma O. & G. et al. 1..... Dry
3-27- 4, Marsh, Magnolia Petroleum 1 ..... Dry
27-26- 5, Fullenweiter, Iowa State Oil 1..... Dry
26-27- 4, Palmer, Magnolia Petroleum 9 ..... Dry
9-29- 4, Harter, Mid-Kansas Oil 6 ..... Dry
25-26- 4, Simpkins, Forest Oil 3 ..... Dry
27-26- 5, Fullenweider, Iowa State Oil 1 ..... Dry
30-24- 4, Bremer, Security O. & G. 1..... Dry
25-26- 4, Simpkins, Wichita-Augusta Oil 3 ..... Dry

Dry 21

MONTGOMERY COUNTY.

6-35-15, Tummocliff, Drohe et al. 1..... Dry
33-34-15, Scovel, Mahutska Oil 2 ..... Dry
7-35-15, Fields, J. Sahfzern et al. 1..... Dry
31-29-16, Scott, J. P. Kelly 1 ..... Gas
27-33-14, Sullivan, K. C. Syndicate 1 ..... Dry
10-33-14, Gopher, Rothrock et al. 6 ..... Dry
2-23-14, Fee, Minn Oil 2 ..... Dry
1-33-15, Broolby, R. V. Hill 1 ..... Dry
28-32-16, Hendrich, Findburg & Stoll 1 ..... Dry
31-29-16, Scott, J. P. Riley 1 ..... Gas
3-35-14, Fecht, C. M. Hamilton 5 ..... Gas
3-35-14, Pollet, C. M. Hamilton 2 ..... Gas
33-34-15, Scovel, Manhattan Oil et al. 2..... Dry
7-35-15, Fields, Shertzer et al. 1..... Dry
7-33-15, Cheesman, Bankers Oil 3 ..... Dry
28-32-16, Hendrick, A. B. Harm 1 ..... Dry
28-31-14, Cole, A. A. Small 1 ..... Dry
3-33-16, Blaker, W. W. Blaker 4 ..... Gas
3-33-16, Blaker, W. W. Blaker 5 ..... Dry
6-35-15, Tummecliffe, J. W. Dyche et al. 1..... Dry
31-32-15, Durett, Compton & Galbreath 3 ..... Dry
31-32-15, Witten, J. F. Overfield 8 ..... Dry
31-22-15, DeMott, Compton & Galbreath 3 ..... Dry
31-32-15, Willie, J. F. Overfield 8 ..... Dry
36-33-14, Mason, Three Sands Oil 3 ..... Dry

Dry 20
Gas 3,000,000
Gas 5

ALLEN COUNTY.

21-25-18, Sims, F. M. Wilbur 1 ..... Dry
10-26-18, Miller, Midvale Oil & Gas 2 ..... Gas
10-26-18, Osborne, L. K. Spielman 4 ..... Dry
33-26-18, McGovern, Combination O. & G. 2..... Gas

Dry 2
Gas 300,000
Gas 2

NEOSHO COUNTY.

4-27-18, Allen, Bates et al. 2..... Dry
27-27-18, Woosley, Fairfield Oil & Gas 3..... Gas
4-27-18, Butler, Liquid Wealth O. & G. 7..... Gas
28-28-20, Haynes, Moore et al. 1 ..... Dry
21-28-18, Barnes, Moore & Loy 1 ..... Dry
26-28-18, McCloud, Chenago Oil 1 ..... Dry
26-28-19, Wagner, Moore et al. 1..... Dry

Dry 5
Gas 250,000
Gas 2

CHAUTAUQUA AND ELK COUNTIES.

31-32-13, Ferguson, Sachem Oil 1 ..... Gas
11-32-12, Doty, Conley & Bowser 1 ..... Dry
25-31-12, Jones, R. C. Ingram et al. 1..... Dry
31-32-12, Seybold, Sachem Oil 5 ..... Gas
31-32-12, Furgeson, Sachem Oil 2 ..... Gas
28-31-14, Cole, Small & Carter Oil 1..... Dry
27-34-10, Hewitt, Elgin Oil 9 ..... Dry
27-34-10, Hewitt, Elgin Oil 10 ..... Dry
27-34-10, Rathburn, Denman Bros. 1..... Dry
2-32- 9, Hylton, Beal & Co. 1 ..... Gas
26-33-11, Woodworth, Iowa Oil 1 ..... Dry
30-33-12, Stephens, Arnold Oil 2 ..... Dry
24-32-12, Holliday Development 8 ..... Gas
27-29-11, Illuminating O. & G. 1 ..... Dry
20-31-13, Gardner, Foster & Dexter 3..... Gas
31-32-13, Wright, Sachem Oil 1 ..... Gas
20-31-13, F. Gardner, Foster & Dexter 2 ..... Gas
29-32-14, Lahn, Chastain Bros. 4..... Dry
24-32-12, Holliday, Mary Holliday 2 ..... Gas
20-31-13, Gardner, Cook No. 3 ..... Gas

Dry 10
Gas 16,000,000
Gas 10

MIAMI, FRANKLIN, DOUGLAS COUNTIES.

8-17-22, Cappell, McCain et al. 1..... Dry
6-17-22, Freeman, Kansas-Duluth Oil 1 ..... Dry
32-16-21, Tullos, Benton O. & G. 6 ..... Dry
15-17-22, Kite, Unknown 1 ..... Dry
10-16-21, Bauman, Choctaw & Chickasha O. & G. 6.. Dry
11-16-21, Watkins, Hawk O. & G. 1..... Dry
22-20-20, Patton, Sperm Oil 3 ..... Gas
22-20-20, Pinney, Progressive Oil 1 ..... Dry
22-20-20, Pinney, Progressive Oil 2 ..... Dry
36-16-22, Van Dresser, Smith et al. 1..... Dry
8-17-22, Kepple, Unnamed Owner 1 ..... Dry
21-17-22, Day, Dadidor et al. 1 ..... Dry
35-16-21, Anthony, Harvey & Allison 3 ..... Dry
1-17-21, Neel, Hurley et al. 1..... Dry
26-16-21, Wilson, Hyde & Harrison 1 ..... Dry

Dry 13
Gas 1

WILDCATS AND MISCELLANEOUS.

Woodson County—
33-26-16, McGovern, Combination O. & G. 2..... Gas
33-26-16, McCloud, Young Bros. 1..... Dry
Greenwood County—
35-25- 8, Ladd, Derby & Marshall 1..... Dry
33-24- 9, Anderson, B. & H. Oil 1 ..... Dry

Dry 3
Gas 100,000
Gas 1

OKLAHOMA.

WASHINGTON COUNTY.

Bartlesville, Etc.—
7-28-13, Condra & Paine, Creta Oil 7 ..... Dry
9-28-13, Morris, Highland Oil 1 ..... Dry
17-26-13, Byron, Three Link Oil 25 ..... Dry
30-29-14, Davis, H. B. Campbell et al. 1..... Dry
7-28-15, Smith, Jones, Lamb et al. 1..... Dry
7-28-15, Smith, Jones, Lamb et al. 2..... Dry
30-29-15, Davis, H. B., Campbell et al. 1..... Dry
18-28-13, Walls, Seamans Oil 3 ..... Dry
9-28-13, Banks, Queen Oil & Refg. 3 ..... Dry
14-24-12, Symonds, Louvain Oil 3 ..... Dry
35-28-13, Johnson, U. S. Oil 2 ..... Dry
35-28-13, Johnson, H. V. Foster 7 ..... Dry

Dry 12

OSAGE COUNTY.

20-27-11, Carter Oil 1 ..... Dry
20-27-11, Carter Oil 3 ..... Dry
19-27-11, Carter Oil 1 ..... Gas

Knowledge is the only fountain both of the love and the principles of human liberty.—Webster.

5-22-12, Prairie Oil & Gas ..... Gas
5-21-13, Bergen Oil 7 ..... Dry
4-21-10, Barnsdall Oil 27 ..... Dry
1-25-11, Boston & Osage Oil 2 ..... Gas
35-24- 8, Santuma Oil 15 ..... Gas
10-28-10, Roxana Petroleum 15 ..... Gas
35-24- 8, Santuna Oil 2 ..... Gas
27-29-10, ndian Territory Oil 207 ..... Dry
9-26-12, Lahoma Oil & Gas ..... Dry
33-22-10, Linona Oil & Markham ..... Dry
8-22-12, Osage Natural Gas 3..... Gas
34-24-10, Mass.-Okla. Oil 5 ..... Dry
25-23- 8, Graham & Bird 2 ..... Dry
8-26-11, Indian Territory Ill. Oil 216 ..... Gas
18-24-12, Osage Oil & Refining 1 ..... Gas
27-22-12, Magnolia Petroleum 12 ..... Gas

Dry 9
Gas 30,000,000
Gas 10

NOWATA-ROGERS COUNTIES.

Cherokee Shallow Sands—
23-24-16, Fee, Cabin Valley Mining 13 ..... Dry
2-24-16, Scott, Arrow Head et al. 8..... Dry
7-25-17, Roberts et al., Tulsa Oil 1 ..... Dry
15-24-17, Palmour, Oklamade Oil & Gas 18..... Dry
5-26-17, Brannon, H. C. Campbell 2 ..... Dry
27-27-15, Stunkard, Cherewata Oil 1 ..... Dry
18-26-15, Barsby, Phillips Petroleum 2 ..... Dry
26-24-16, Fee, Wiser Oil 3 ..... Dry
26-26-15, Rogers. A. C. Bailey 1 ..... Dry

Dry 9

TULSA COUNTY.

Bird Creek, Etc.—
13-21-13, Abholt, A. D. Woody et al. 3..... Dry
36-20-12, Collins, Busha & Co. ..... Dry
4-21-13, Adair, Dollilis et al. 1..... Dry
5-21-13, Hitchie, Berger O. & G. ..... Dry
35-21-14, Keys.Mallory & Curtis 3 ..... Dry

Red Fork and Sand Springs- ..
8-19-11, Island, Nelson et al. 1..... Gas
8-19-11, Island, Nelson et al. 3 ..... Gas
29-19-11, Leader, Billingslea et al. 1..... Dry
20-19-11, Childers, Jackson et al. 1..... Gas
20-19-11, Rogers, Howard & Duffield 2 ..... Gas
29-19-11, Payne, Texas Co. 1 ..... Gas
20-19-11, Martin, Jackson & Wise 1 ..... Gas
29-19-12, Payne, Texas Co. 1 ..... Gas
27-19-12, Clinton, Texas Co. 1 ..... Dry
27-19-12, Clinton, Volger et al. 12..... Dry
20-19-11, Rogers, Paxton Oil 2 ..... Gas

Broken Arrow—
10-18-15, Webster & Olson 4 ..... Dry
4-19-14, Mills, Dean et al. 2 ..... Dry
1-18-13, Sango, L. L. Colburn 3 ..... Dry
31-18-14, Halkey, Reynolds et al. 2..... Dry
23-19-13, Eubank, Miles et al. 4..... Dry
34-18-14, Childers, Webster et al. 3..... Dry
13-18-14, Barnett, Bearman et al. 6 ..... Dry
19-18-14, Tiger, Webster et al. 4..... Dry

Bixby—
33-16-13, Good, Cosden O. & G. 1 ..... Gas
25-16-14, Grayson, Peterson et al. 2..... Dry
14-17-13, Allen, Davis & Younger 2 ..... Gas
35-16-13, Atkins, Tammany Oil 4 ..... Dry
6-17-13, Dayton, French et al. 3..... Dry
16-17-13, Wildcat, Wieth & Weldy 3 ..... Dry
25-17-14, Riverbed, Wagoner et al. 1..... Dry
15-16-13, Tiger, Gladys Oil 7 ..... Dry
5-16-13, Rowland, J. H. Markham, Jr. 2..... Dry
29-17-13, Berryhill, Marshall & Simmons 2..... Dry

Dry 24
Gas 65,000,000
Gas 10

OKMULGEE COUNTY.

Mounds—
35-16-11, Grayson, Tex. Co. 1 ..... Dry
31-16-12, Steele, Texas Co. 4 ..... Dry
26-16-11, Harris, Cunningham et al. 1..... Dry
31-14-12, Metzgar O. & G. 1 ..... Dry
8-13-12, Wigton, Alexander et al. 1..... Gas
34-13-12, Burns et al. 1..... Dry
8-13-12, Harjo, W. B. Pine et al. 1..... Gas
30-13-13, Stewart, Barbara Oil 1 ..... Gas
34-13-12, Bruner, Sequoyah Oil 1 ..... Dry
21-13-12, Kanard, Devinne et al. 1..... Gas
24-13-12, Atkins, Gumbo Oil 3 ..... Gas
34-13-12, J. R. Burns 1 ..... Dry
12-13-11, Fink, Dickerson et al. 2..... Dry
35-13-12, Atkins, C. B. Shaffer 2 ..... Dry
25-14-11, Scott, Wilcox et al. 1..... Dry
25-14-11, Fee, Texas Co. 7..... Dry
36-14-11, Gill, Okmulgee P. & R. 1 ..... Dry
26-14-12, Kanard, Alexander et al. 1..... Dry

Okmulgee-Morris—
24-13-13, McGilbra, H. C. Baker et al. 4..... Dry
27-13-13, Johnson, Okmulgee P. & R. 1..... Dry
34-13-14, Fat., Mountain Fork Oil 5 ..... Dry
5-12-13, Lowery W B. Pine 2 ..... Dry
30-13-13, Harjo, Ba bara Oil 4 ..... Gas
8-13-12, Gray, Iowa Oil 1 ..... Gas
21-14-12, Washington, Unity Oil 2..... Dry
9-13-13, Sone, Okmulgee P. & R. 1..... Gas
21-14-14, Schock, United Producers 4 ..... Dry
1-14-14, Peterson, Okla. Penn. Oil 4..... Dry
2-14-13, Leader, Ohio Cities Gas 3 ..... Gas
6-14-13, Thompson, Lyons et al. 1..... Dry
13-15-13, Malone, First Choice Oil 2..... Gas
24-15-13, Bruner, Turnbuckle Oil 2 ..... Dry
1-14-14, Harris, Reno et al. 2..... Dry
13-14-14, Rentie, Huling et al. 4..... Dry
24-14-13, Thomas, E. R. Black 1 ..... Dry

Henryetta—
9-12-14, Jackson, Aggas et al. 1..... Dry
36-12-11, Griffith, McMahon et al. ..... Dry
31-12-12, Rentie, Wilson & Clark 2..... Dry
30-12-12, Rentie, Brink Oil 2..... Dry

Dry 29
Gas 75,000,000
Gas 10

OKMULGEE, ROGERS AND WAGONER COUNTIES.

Coweta—
29-17-15, Noble, Papoose Oil 1 ..... Dry
20-17-15, Reed, North American Oil 1 ..... Dry
30-17-15, Riverbed, Wagoner et al. 9..... Dry
20-17-15, Simmons, Livingston Oil 1 ..... Dry
20-17-15, Noble, Papoose Oil 1 ..... Dry
30-17-15, Wagner et al. 4 ..... Dry

Catoosa—
10-18-15, Drew, Edgar Oil 2 ..... Dry
30-18-15, Tiger, Oliver et al. 1..... Dry
10-18-15, Rogers, H. W. Talbot 3 ..... Dry

Haskell and Iron Bluff—
27-16-15, Roe, Robinson et al. 1..... Dry
30-16-15, Grayson, Carter Oil 6 ..... Dry
18-15-15, Henderson, Caney River Gas 2..... Dry
13-15-16, Perryman, Jas. Whitesides 1 ..... Dry
32-15-16, Franklin, Caney River Gas 1..... Dry
3-15-15, Corbral, Producers & Refiners 1 ..... Dry
3-15-15, Corbray, Producers & Refiners 1..... Dry
17-15-16, McDaniel, Muskahoma Oil 2..... Gas
3-15-15, Corbray, Egolf et al. 1..... Dry
18-15-16, Harris, McMahon et al. 2..... Dry
21-15-16, Taylor, Bradstreet et al. 1..... Gas
22-15-16, Taylor, Hazlett & Brown 1 ..... Dry
28-15-16, Herrod, Gillespie 1 ..... Dry
17-15-16, McDaniels, Peterson et al. 7..... Gas
34-15-16, Richards, Minnekota Oil 3 ..... Dry

Boynton and Cole Pool—
14-14-15, Steadham, W. B. Pine 3 ..... Dry

Best men are moulded out of faults.—Shakespeare.

1-13-15, Freeman, Lambert et al. 3 ..... Gas
14-13-15, Dan, Penn Wyoming Oil 7 ..... Dry
2-14-15, Smith, Capps & Rose 2 ..... Dry
1-14-15, Manuel, Gulick et al. 1 ..... Gas
7-13-15, Freeman, W. B. Pine 2 ..... Gas
15-13-15, McGilbra, McLaughlin et al. 1 ..... Dry
4-13-15, Taylor, Credo Oil 2 ..... Gas
2-14-15, Davis, Cosden Oil & Gas ..... Dry
28-14-15, Cooper, N. Carter 1 ..... Dry

Muskogee and Miscellaneous—
10-15-18, Durant, White River O. & G. 1 ..... Dry
34-18-16, Barnett, Grand River Pet. 1 ..... Dry
25-13-16, Francis, Navy Oil & Gas 2 ..... Dry

Dry 29
Gas 60,000,000
Gas 7

CREEK COUNTY.

Glenn Pool—
22-17-11, Jack, Old Dominion Oil 6 ..... Dry
27-18-11, Bruner, Ingalls et al. 2 ..... Dry
24-18-11, Berryhill, H. J. Herbert 1 ..... Gas
13-18-11, Lee, Lee Oil 19 ..... Dry
32-18-12, Parks, Spring Oil 11 ..... Dry
18-17-12, Quinn, Seth Ely 2 ..... Dry
31-18-12, Trelan, Vogler & Reynolds 1 ..... Dry
3-18-12, Adams, Gilger et al. 1 ..... Dry
34-17-12, Agent, P. & R. 2 ..... Gas
33-18-12, Parks, Spring Oil 12 ..... Dry

Cushing and Olive—
23-18-7, Riley, P. O. & G. 1 ..... Gas
12-17-7, Jacobs, J. W. Van Horn et al. 1 ..... Dry
3-16-7, Williams, Magnolia Pet. 15 ..... Dry
3-16-7, Williams, Magnolia Pet. 16 ..... Gas
1-17-7, Stevens, Lancaster & Kerr 1 ..... Dry
1-17-7, Fixico, Monitor Oil & Gas 3 ..... Gas
7-17-8, Doke Oil 1 ..... Gas
34-17-7, Mitchell, Iron Mountain Oil 21 ..... Gas
35-18-7, Jones, Magnolia Pet. 1 ..... Gas
7-17-8, Samuel, Atlantic Petroleum 1 ..... Dry
9-18-7, Scott, P. O. & G. 1 ..... Dry
12-17-7, Jacobs, Van Horn Oil 1 ..... Dry
36-18-7, Jones, Carter Oil 1 ..... Gas

Tuskogee—
2-15-9, Hamilton, Joe Abraham 2 ..... Gas

Mannford—
34-18-9, Brown, Wolverine Oil 2 ..... Dry

Dry 15
Gas 37,000,000
Gas 10

PAWNEE COUNTY.

Cleveland—
26-20-7, Anderson, Compound O. & G. 1 ..... Dry
26-27-7, Anderson, Compound O. & G. 2 ..... Gas
19-21-8, Skinner, Skinner Oil 2 ..... Dry
25-20-8, Head, Southwestern O. F. 1 ..... Dry
18-20-7, Boten, Carter Oil 1 ..... Dry
26-20-7, Richards, Markham & Grieves 1 ..... Gas
32-21-8, Sewell, State Lands Pet. 2 ..... Dry

Dry 5
Gas 1,000,000
Gas 2

PAYNE COUNTY.

Yale, Etc.—
1-18-5, Ellis, Okla. Nat. Gas 1 ..... Gas
25-18-5, Fruend, Rowland et al. 1 ..... Gas
3-19-6, Scofe, Suppes et al. 1 ..... Dry

Dry 1
Gas 22,000,000
Gas 2

GARFIELD AND NOBLE COUNTIES.

Billings District—
14-23-2, Neil, Ohio Cities Gas 1 ..... Dry

Garber District—
33-22-4, Hine, Tuloma Oil 1 ..... Dry

Dry 2

KAY COUNTY.

Blackwell, Newkirk and Ponca City—
11-27-3E, Shuping, Ivanhoe Oil 8 ..... Dry
23-28-1W, Woods, National Union Oil 1 ..... Dry
15-27-1W, Smithman, Cherokee Oil 2 ..... Gas
30-29-1E, Hobaugh, Empire G. & F. 2 ..... Gas
30-28-1E, Kuhne, Minnehoma Oil 2 ..... Dry
32-27-1W, Elledge, Independent Refg. 1 ..... Dry
10-27-1E, Humphrey, Glenrose Oil 1 ..... Gas
16-27-5E, Riggs, South Carolina Oil 1 ..... Dry
10-27-1, Clifft, Independent Oil 1 ..... Dry
31-29-1, Pratt, Empire Gas & Fuel 2 ..... Gas
15-27-1, Johnson, Lucky Leaf Oil 1 ..... Gas
15-27-1, Otstot, Cherokee Oil & Gas 2 ..... Gas
6-28-1, Harvel, Duluth-Okla. Oil 4 ..... Dry

Dry 7
Gas 45,000,000
Gas 6

CARTER COUNTY.

Healdton and Fox—
24-4-3, Rhodes, Carter Oil 3 ..... Dry
5-4-3, Mullin, Sinclair Gulf Oil 23 ..... Dry
20-3-4, Mullen, Gypsy Oil & Johnson 1 ..... Dry
1-3-1, Ervin, Stephens Oil & Gas 1 ..... Dry
31-2-2, Bennett, Kirk Oil 1 ..... Gas
27-3-2, Caldwell, American Ind. Oil 4 ..... Gas
5-4-3, Mullin, Sinclair Gulf Oil 22 ..... Dry
29-2-3, Tucker, Phillips Pet. 1 ..... Gas

Dry 5
Gas 50,000,000
Gas 3

WILDCATS.

Woodard County—
3-21N-21W, Baker, Home Producers 1 ..... Dry

Muskogee County—
6-13-18, Dean, Barbara Oil 1 ..... Dry

Pawnee County—
29-22N-3E, Jackson, Watchorn et al. 1 ..... Dry

Pontotoc County—
23-5-8, Qualls, K. C. Oil 2 ..... Dry
28-5-8, Gilmore, Lyndale Oil 4 ..... Dry
34-5-8, Crabtree, Homa Okla. Oil 2 ..... Gas

Cotton County—
14-1S-10W, To-Ge-Nipper, Douglas & Skelton 1 ..... Gas
26-1S-10W, Grave, Keys et al. 1 ..... Gas

Stephens County—
22-1S-5W, Sanner, Velma Oil 1 ..... Dry

Kay County—
15-27-1, Johnson, Lucky Leaf Oil 1 ..... Gas

Pittsburgh County—
1-7N-18E, Lewis, Pittsburgh Oil & Gas 2 ..... Gas

Garfield County—
13-20N-4W, Logan Oil 1 ..... Dry

Kay County—
10-27-1, Humphrey, Glenrose Oil 1 ..... Gas

Kiowa County—
10-2N-20W, St. Louis-Okla. Oil 1 ..... Dry

Ellis County—
13-21N-26W, Boyd, Sterling Oil 1 ..... Dry

Dry 0
Gas 60,000,000
Gas 6

NEBRASKA.

32-19-55, Kelly, P. O. & G. 1 ..... Dry

Be checked for silence, but never taxed for speech.—Shakespeare.

KANSAS.

SUMMARY OF WELLS COMPLETED.

	Comp.	Prod.	Dry	Gas
Butler	152	32,372	30	0
Chautauqua-Elk	54	417	8	10
Montgomery	78	427	20	5
Miami-Fr'k'n-Douglas	69	426	16	1
Wilson	18	348	0	0
Allen	39	305	2	2
Neosho	64	696	5	2
Wildcats	28	732	3	1
Total	502	35,723	84	21

OKLAHOMA.

SUMMARY OF WELLS COMPLETED.

	Comp.	Prod.	Dry	Gas
Osage	116	4,209	10	9
Washington	48	477	12	0
Nowata-Rogers	77	1,800	9	0
Tulsa	100	3,395	24	11
Okmulgee	155	10,369	32	10
Creek	80	2,740	15	9
Muskogee-Wagoner-Rogers	85	8,532	27	7
Payne	18	1,758	1	3
Pawnee	13	160	6	0
Garfield-Noble	19	9,040	1	0
Kay	27	2,970	9	6
Carter	33	2,440	7	3
Wildcats	18	85	9	6
Total	789	47,975	162	64

KANSAS-OKLAHOMA-ARKANSAS.

	Comp.	Prod.	Dry	Gas
Kansas	502	35,723	84	21
Oklahoma	789	47,975	162	64
Arkansas	6	0	6	0
Total	1,297	82,998	252	85

WYOMING.

11-32-82, Iron Dome, New York Oil 3	Gas
16-43-94, Warm Springs, Williams & McGrath	Dry
22-33-76, State Land, Ohio Oil 1	Dry
33-46-98, Findlay, Ohio Oil 2	Dry
5-58-99, Placer Claim, Old Colony Oil 1	Gas
22-49-89, Government Land, Shiloh Oil 1	Dry
16-57-97, Government Land, Elk Basin Oil 1	Dry
4-56-97, Howell, Wyo. Dixie Oil 1	Dry
2-42-94, Patented Land, Markham et al. 1	Dry
28-40-79, Government Land, Jupiter Oil 1	Dry
30-40-79, Government Land, Bessemer Oil 1	Dry
20-40-79, Marshall, Cactus Petroleum 1	Dry
Dry	10
Gas	2
Gas production	22,000,000

WYOMING.

GENERAL SUMMARY.

	Comp.	Prod.	Dry	Gas
May	21	2,175	10	2
April	12	795	3	2
Difference	9	1,380	7	0

TEXAS PANHANDLE.

WICHITA AND WILBARGER COUNTIES.

Electra—

Herron, Texas Co. 4	Dry
Honaker, Magnolia Pet. 1	Dry
Fisher, Smith-Hewitt 1	Dry
Zeiset, Colorado-Texas Oil 1	Dry
Honaker, Sunset Oil 1	Dry
Fisher, Hub Oil & Gas 1	Dry
Hall, Juel Oil 1	Dry
Chenworth, Chenworth Oil 1	Dry
Wagner, Godley et al. 1	Dry
Humphries, Hall et al. 1	Dry
Hall, Good Luck Oil 1	Dry
Dry	11

SUNSHINE HILL.

Zeiset, Zincher et al. 1	Dry
Ward & Todd, Southwestern Pet. 1	Dry
Humphries, Hall et al. 1	Dry
Jennings, Hull et al. 1	Dry
Dry	4

BURKBURNETT AND VICINITY.

Hardin, Mann et al. 37	Dry
Markowitz, Hemco Oil 1	Dry
Warren, Cozy Oil 6	Dry
Warren, Allies Oil 2	Dry
Warren, Allies Oil 3	Dry
R. W. Ramming, Staley et al. 2	Dry
Bailey, Liberty Oil 1	Dry
Roller, Claud Oil 1	Dry
Willis, Turner et al. 4	Dry
Ramming, W. G. Skelly 8	Dry
Beach, Birkdell Oil 9	Dry
Beach, Birkdell Oil 10	Dry
Beach, National Oil & Gas 19	Dry
Beach, National Oil & Gas 20	Dry
Dodson, Pure Oil 4	Dry
Fowler, Texhoma Oil 5	Dry
Fowler, Texhoma Oil 6	Dry
Warren, Allies Oil 3	Dry
Clara, Adams Oil 1	Dry
Dry	19

CLAY COUNTY.

Root, Harvey et al. 1	Dry
Holloway, Lone Star Gas 1	Gas
Dry	1
Gas	1
Gas volume	5,000,000

EASTLAND COUNTY.

Pratt, Champion, Cunningham et al. 1	Dry

BROWN COUNTY.

Near Brownwood—

Page, Miller et al. 1	Dry
Munn, Callopy et al. 1	Dry
Windham, Darby et al. 1	Dry
Dry	3

WILDCATS.

Palo Pinto County—

McDonald, Texas Co. 1	Dry
Oakes, Owen & Wilson 1	Dry

Parker County—

Acme, Plains Oil & Gas 1	Dry
Merten, Parker County Oil & Gas 1	Dry
Dry	4

The food of hope is mediated action.—Bulwer.

NORTH TEXAS-PANHANDLE.

SUMMARY OF COMPLETED WORK.

Electra	21	675	11	0
Sunshine Hill	30	280	4	0
Burkburnett	58	1,722	19	0
Clay County	2	0	1	1
Eastland County	4	535	1	0
Stephens County	2	175	0	0
Brown County	32	410	3	0
Miscellaneous	6	10	4	0
Total	155	3,807	43	1

NORTH LOUISIANA.

Caddo—
33-21-15, Louisiana Gas, Richardson Oil 2 ..... Dry
10-20-15, Glassell, Mo-La Oil 4 ..... Dry
10-19-15, Caddo Levee Board, Layne 1 ..... Dry
Bossier—
10-16-11, Mercer, The Texas Co. 1 ..... Dry
Miscellaneous—
12-19- 4, Kerr, Central Co. Inc. 1 ..... Gas
35-20- 4, Moore, Peerless Carbon Black 1 ..... Gas
17-13, Mandina, Gulf Refg. 1 ..... Gas
25-17-14, Fee, Ark. Natural Gas 67 ..... Gas
32-20-11, Heilperin, Standard Oil 1 ..... Dry
30-11- 9, Carnes, Lake End Oil & Gas 2 ..... Dry
Texas-Marion County—
Singleton, C. A. Crowl et al. 1 ..... Dry

Dry 7
Gas wells 4

NORTH LOUISIANA.

SUMMARY OF OPERATIONS.

	Comp.	Prod.	Dry	Gas
Caddo	31	25,055	3	0
De Soto	2	505	0	0
Red River	0	0	0	0
Bossier	2	75	1	0
Miscellaneous	8	105	3	4
Total	43	25,740	7	4

GULF COAST.

BATSON.

Milhome, The Sun Co. 62 ..... Gas

GOOSE CREEK.

Stateland-Producers, Gulf Prod. 9 ..... Gas
Adoue, Green et al. 1 ..... Gas

Gas 2

GULF COAST.

SUMMARY OF OPERATIONS.

Dist.	Comp.	Prod.	Dry
Anse LaBute	0	0	0
Batson	8	60	2
Damon Mound	3	500	1
Edgerly	7	740	0
Goose Creek	29	22,165	4
Humble	46	800	13
Jennings	0	0	0
Markham	2	0	2
Spindletop	18	1,240	4
Saratoga	13	2,525	6
Sour Lake	19	575	5
Vinton	9	3,920	4
New Iberia	2	0	2
Piedras Pintas	4	35	1
Miscellaneous	28	75	26
Totals	188	32,635	70

TEXAS-LOUISIANA.

	Comp.	Prod.	Dry	Gas
North Texas	155	3,807	43	1
North Lou siana	43	25,740	7	4
Gulf Coast	188	32,635	70	4
Total	386	63,182	129	9

STANDARD OIL SUBSIDIARIES.

BY JO. P. CAPPEAU SONS.

From May 20th to June 20th.

	Open	High	Low	Last
£1 Anglo-American	11¾	11⅞	11	11½
$100 Atlantic Ref.	915	925	900	905
100 Borne-Scrymser	425	450	425	440
50 Buckeye Pie	94	95	90	92
100 Chesebrough	315	315	300	300
100 Colonial	10	10	10	10
100 Continental	425	440	420	425
50 Crescent	35	38	30	38
100 Cumberland	150	155	130	140
100 Eureka	205	205	200	200
100 Galena Com.	134	134	125	125
100 Galena Pref.	123	124	120	120
100 Illinois Pipe	183	185	162	162
50 Indiana Pipe	95	97	93	94
12½ National Transit	13	13½	12	12½
100 New York Transit	210	210	200	205
100 Northern Pipe	110	112	100	103
25 Ohio Oil	345	345	320	320
100 Prairie Oil	490	515	485	510
100 Prairie Pipe Line	275	275	258	262
100 Solar Refining	310	310	295	295
100 Southern Pipe	188	188	180	180
100 South Penn. Oil	280	280	270	265
100 South West Penn. Pipe	92	94	90	90
100 S. O. of California	215	217	208	210
100 S. O. of Indiana	640	630	615	615
100 S. O. of Kansas	445	450	440	450
100 S. O. of Kentucky	330	330	320	320
100 S. O. of Nebraska	465	465	460	450
100 S. O. of New Jersey	550	550	528	528
100 S. O. of New York	270	278	265	270
100 S. O. of Ohio	395	400	390	390
100 Swan & Finch	93	93	88	90
100 Union Tank	100	101	95	96
100 Vacuum Oil	355	355	335	333
10 Washington Oil	25	27	25	27
25 Penn-Mex.	35	35	29	29
5 International Petroleum	13½	13½	12½	12¾

Independent Oil Companies.

5 Elk Basin	6⅜	6⅜	5¾	6¼
20 Pierce Oil	10	14½	9½	14½
50 Midwest Refining	114	115	104	111
25 Tropical Oil	11¾	11⅞	11	11¼
5 Cosden Refining	6⅞	7⅜	6⅞	6⅞
5 Sapulpa Refining	8⅝	9¾	8½	9⅜
1 Northwest Oil	63	63	59	62
5 Cosden & Co.	3⅝	3¾	3½	3½
5 Okla. Producing & Ref.	7⅞	7⅞	6⅝	7⅛
5 Atlantic Petroleum	2¾	2⅞	2½	2⅝
10 Merritt Oil	22½	28½	19½	28¼
1 Midwest Oil	100	116	100	115

To a man full of questions give no answer at all.—Plato.

AROUND THE BELT

New Wells, New Pipe Lines, New Contracts, Additions and Extensions. A Fund of Valuable News Gathered for the Journal Through Many Sources.

TRADE PERSONALS

ARMSTRONG, GEORGE W., has resigned from the office of President of the Fort Worth Gas Company, Fort Worth, Tex.

BAHAN, W. H., of Fort Worth, Texas, recently was elected President of the Fort Worth Gas Company.

BEDFORD, A. C., of the Standard Oil Company is now President of the Peoples Natural Gas Company, Pittsburgh, Pa., succeeding John G. Pew.

BOYCE, RICHARD, of Zanesville, Ohio, has been elected President of the Otsego Gas Oil Company, Otsego, Ohio.

BUNER, C. W., of Otsego, Ohio, has been elected Vice-President of the Otsego Gas Oil Company.

GAGE, PAUL, who was formerly Vice-President of the Lone Star Gas Company, Fort Worth, Texas, is now in charge of oil developments in the North Texas field for the company.

HARRINGTON, HUGH, Safety Inspector of the Empire Gas & Fuel Company, Bartlesville, Okla., has left his post in order to join the army.

HEMMICK, O. L., who severed his connection with the Empire Gas & Electric Company, Bartlesville, Ohio, to join the army, is reported as having arrived in France.

HURST, EDWIN, formerly Superintendent of the Wichita Pipeline Company, Neodesha, Kan., is now with the Quapaw Gas Company, Joplin, Mo., in a similar capacity.

McDONALD, DONALD Vice-President and General Manager of the Louisville Gas & Electric Company, Louisville, Ky., addressed a mass meeting of manufacturers connection with the movement to secure war contracts for the city.

MONTGOMERY, FIRST LT. ROBERT, who was Manager of the Commercial Department of the Louisville Gas & Electric Company before joining the colors, is now stationed at Camp Sherman, Chillicothe, Ohio.

MYERS, WATLER S., Commercial Engineer for the Louisville Gas & Electric Company, has been selected by the Louisville War Industries Committee to go to Washington to secure war contracts for local manufacturing concerns.

NIEDERMEYER, A., for many years connected with the Worthington Pump & Machinery Corporation, most recently as Works Manager of the Snow-Holly Works of that corporation at Buffalo, N. Y., resigned recently to devote his entire time to enterprises of his own.

PEW, JOHN G., has resigned as President of the Peoples Natural Gas Company, as Vice-President and Manager of the Hope Natural Gas Company, as Manager of the River & Reserve Gas Company, the Connecting Gas Company, and the Marion Oil Company. Mr. Pew is now President and General Manager of the Sun Shipbuilding Co.

PLAGG, WILBUR, who was formerly on the staff of the New Business Department of the Arkansas Valley Gas Company, Arkansas City, Kan., is now in training at Camp Funston.

RAUCH, GEORGE, formerly of the Joplin Gas Company, Joplin, Mo., is now Manager of the company at Orrville, Ohio.

RICHARDSON, G. H., who was auditor of the Oklahoma Gas & Electric Company's Division at Drumright, Okla., recently became Auditor for the company at its Oklahoma City office.

SHANNON, O. K., recently became Vice-President of the Fort Worth Gas Company, Fort Worth, Texas.

TAYLOR, FENTON J., who has been local Manager for the Pavilion Natural Gas Company, for Leicester and Mt. Morris, N. Y., during the several years that these places have been connected up with the Pavilion wells, has been appointed local Manager for practically all of the places served with gas by the Pavilion Company. His headquarters will be at Le Roy.

TSCHACHTLE, VICTOR R., who for some time has been Purchasing Agent for the Empire Gas & Fuel Company, with headquarters at Augusta, Kan., is now in army service as interpreter of French.

WALTON, J. D., has been appointed Assistant Superindent of the Iroquois Natural Gas Company, Buffalo, N. Y.

WILLARD, JESS, champion heavyweight pugilist, has begun to realize his ambition to become an oil man, having invested with the Occident Oil & Refining Company at Wichita, Kan.

O'NEAL, LAWRENCE, a member of the force of the Louisville Gas Company, Louisville, Ky., for over thirty years, died recently at his home in that city.

ITEMS OF FINANCE

NEW YORK—Buffalo

The Iroquois Natural Gas Company of Buffalo, N. Y., filed with the Public Service Commission, Second District, a petition asking authority to issue $169,403.78 of stock to reimburse its treasury for expenditures made from capital stock from July 1, 1914. The company's petition soys the amount was expended for construction, completion, extension and improvement of its service.

PENNSYLVANIA—Pittsburgh

The financial report of the Philadelphia Company for the fiscal year ending March 31, 1918, showed for the natural gas department a gross revenue of $15,506,298, and for the oil department $794,283.

There is no difficulty to him who wills.—Kossuth.

INCORPORATED

ARKANSAS—Little Rock

The following local capitalists form the board of directors of a company organized to undertake development work in the Ranger field in North Central Texas. J. W. Trieschman, President; W. E. Biggs, Vice-President; C. W. Beale, Secretary; C. N. Faubel, Treasurer; C. Floyd Huff, Sam Costen, A. B. Fairfield, C. L. Moore, Jr., and John P. Streepey.

DELAWARE—Dover

The National Commercial Oil & Gas Company has been incorporated under the laws of this State with a capital of $1,000,000, by A. W. Posey, H. Bonsall, and G. H. Haydene, all of Wilmington.

Dover

The Twin City Oil & Gas Company was incorporated here with a capital of $500,000. Those named as incorporators are F. R. Hansell, J. Verbon Pimm and S. C. Seymour, all of Philadelphia.

OHIO—Canton

The Security Oil & Gas Company has been incorporated at Columbus with a capital of $50,000. Those named as incorporators are: C. Edward Haley and Robert S. Magee, of Canton.

Uhrichsville

The Rice Oil & Gas Company has been incorporated here with a capital stock of $50,000. The incorporators are: C. W. Rice, J. L. Rice, H. F. Rice, B. W. Peck, H. P. Copeland.

WEST VIRGINIA—Huntington

A new concern in the field of development is the Production Development Company which was organized here to operate in the Harrison County fields. The new concern has a capital of $100,000. The incorporators are: O. C. Huffman, I. F. Vase, A. J. Crowell, E. J. Hofmeier, and K. L. Berglass.

Lowther

The Lowther Oil & Gas Company has been organized to operate in Kentucky and other fields, with a capital stock of $50,000. The incorporators are: C. F. Lowther, D. V. Lowther, C. N. Davis, S. S. Melvin and M. M. Lowther.

PER CUBIC FOOT—RATES

ARKANSAS—Little Rock

The Little Rock Gas & Fuel Company has increased its rates as follows: For the first 50,000 cubic feet, 45 cents per 1,000 cubic feet; for the next 50,000 cubic feet, 35 cents; for the next 50,000 cubic feet, 30 cents; for the next 50,000 cubic feet, 25 cents; for all over 200,000 cubic feet, 20 cents. The old rates were: For the first 10,000 cubic feet, 40 cents per 1,000 cubic feet; for the second 10,000 cubic feet, 35 cents; for 130,000 cubic feet, 30 cents per 1,000 cubic feet; for 200,000 or more cubic feet, 20 cents per 1,000 cubic feet.

Pine Bluff

The Arkansas Natural Gas Company has increased its rates 5 cents per thousand to small consumers, and 15 cents to large users.

INDIANA—Muncie

The Central Indiana Gas Company has been granted authority to increase its rates to large consumers from 30 to 35 cents per thousand for gas used over 5,000,000 cubic feet. This change applies to consumers in this city, Marion, Anderson, Elwood, Hartford City, Fairmount, Alexandria, Riverside City and Normal City.

Rushville

The Peoples Natural Gas Company is making request for permission to increase its rates from 30 cents per thousand to $1.00 per thousand for the first 1,000 cubic feet, and 50 cents per thousand for all over 1,000.

KANSAS—Kansas City

According to report, a rate of $1.00 a thousand cubic feet for gas will be charged by the distributing companies of Kansas City, and St. Joseph, Mo., Kansas City, Kas., and a number of smaller Kansas towns. The present rate is 60 cents.

LOUISIANA—Little Rock

In the franchise recently granted to Louis Lock of Monroe, La., to bring gas to Little Rock the rates are fixed as follows: For 1,000,000 feet, 15c per 1,000 cubic feet; for 500,000 cubic feet, 20 cents; for 100,000 and less than 500,000 feet, 25 cents; domestic consumers, 35 cents per 1,000 cubic feet.

Shreveport

The Southwestern Gas & Electric Company has raised its rate to small consumers from 22½ cents to 27 cents net per thousand. The rate for large users has been advanced from 7.7 cents to 10 cents per thousand.

NEW YORK—Buffalo

Under court ruling the increased rates filed by the Iroquois Natural Gas Company have become effective.

Corning

The Crystal City Gas Company has been permitted by the Public Service Commission to increase rates for natural gas from 45 to 58 cents per thousand cubic feet and the minimum charge per month from 45 cents to $1.10.

Dunkirk

The South Shore Natural Gas Company has filed a petition with the Public Service Commission to increase its rates to factories to 27 cents per 1,000 feet, which is the same rate charged for domestic purposes. The prompt payment discount of ten cents per thousand to factories using a million cubic feet or over is also reduced to three cents per thousand cubic feet.

The South Shore Natural Gas & Fuel Company has served notice on its large consumers that effective July 25, an increase in gas rates to the maximum amount allowable under the franchise will be made. This will be a raise from twenty to twenty-seven cents per thousand feet.

Talent is that which is in a man's power; genius is that in whose power a man is. Lowell.

Medina

The Medina Gas & Fuel Company has increased its rates from 28 cents to 38 cents per thousand, less a discount of 3 cents. This advance applies also to the villages of Seville, Creston, Leroy and Lodi, all served by the Medina company.

Olean

The Producers Gas Company has filed a petition with the Public Service Commission asking permission to increase its rate from 39 cents to 42 cents per thousand in Olean, Olean Town and the village of Portville.

Pulaski

The Pulaski Gas & Oil Company has increased its rate for less than 40,000 cubic feet from 55½ cents to 62½ cents per thousand.

OHIO—Cincinnati

Judge Hollister of the United States District Court at Cincinnati, has granted to the Union Gas & Electric Company a temporary injunction restraining the city of Cincinnati from putting into effect the 30-cent gas rate ordinance passed by the City Council August 20, 1917.

OKLAHOMA—Oklahoma City

The Oklahoma Natural Gas Company has been authorized by the State Corporation Commission of Oklahoma to charge a minimum rate of 20 cents per thousand cubic feet for natural gas furnished by it in the State, subject to 10 per cent. discount. Four Byllesby properties are benefited: Enid, El Reno, Muskogee and Oklahoa City divisions of the Oklahoma Gas & Electric Company.

PENNSYLVANIA—Glenshaw

The Glenshaw Natural Gas Company has increased its rate from 30 cents net to 35 cents net per thousand cubic feet. A minimum charge of 70 cents net per month has been established. The company supplies the northern portion of Allegheny County.

GENERAL

ARKANSAS—Little Rock

Application for a natural gas franchise in this city has been filed by Louis Lock of Monroe. It is claimed that the gas supply controlled by Mr. Lock is taken from twenty-eight wells in the fields near Monroe, La.

ALABAMA—Gadsden

The Gadsden Oil & Gas Company has been formed in this city for the purpose of undertaking development work in Owl's Valley.

CALIFORNIA—McKittrick

The pipe line of the Pacific Light & Fuel Company is being extended to this city.

Worland

It is reported that a gasoline absorption plant will be constructed in the Hidden Dome field, located near this city. The plant will be built by the Petroleum Gas Products Company, and will cost in the neighborhood of $500,000.

DISTRICT OF COLUMBIA—Washington

Government control for distribution of steel will not be permitted to retard the production of petroleum and oil gas which are considered essential to the war, according to an announcement made by the oil division of the Fuel Administration. The Government will assist drilling contractors and producers in securing drilling materials.

INDIANA—Richmond

The Richmond Light, Heat & Power Company, it is reported, will be unable to secure natural gas from the West Virginia fields after Novembet 1st, the supply being insufficient.

KANSAS—Arkansas City

The Empire Gasoline Company has completed its sixth gasoline absorption plant. It is located one mile north of this city. The new plant handles 50,000,000 cubic feet of gas daily.

Chanute

A new town border meter and regulating station has been established by the Wichita Pipeline Company on the grounds of the Chanute Smelting Company.

El Dorado

The Empire Gas & Fuel Company recently completed two good gas wells in the El Dorado field.

KENTUCKY—Glasgow

A large gasser has been completed by the Hoffman Oil Company on the Sam Francis farm, near this city.

Modoc

The Modoc Natural Gas & Oil Company reports successful drilling operations in nearby fields. The officers of the company are: S. C. Mendenhall, of Winchester, President; John W. Wright, of Modoc, Vice-President, and A. A. Conorroe, of Modoc, Secretary-Treasurer.

LOUISIANA—Jefferson County

The Marion Oil & Gas Company has a large gasser in new territory near Red River. The gas was found at a depth of 1,535 feet.

Monroe

One hundred and forty thousand dollars has been set aside by the Ouachita Natural Gas Company to take care of improvements.

Lacorehouse Parish

The Mountain and Gulf Oil Company completed a 15,000,000-foot gas well in No. 1 Spyker, Section 39-20-5, at 3,700 feet.

New Orleans

According to report, the McCormick interests claim to be able to pipe natural gas to the city by December of this year. It is said that pipe is available sufficient to connect the city with the wells at Houma. The city is debating whether it will undertake to construct the pipe line on its own account, or include the constructing of the line in the agreement with the McCormick interests.

The Orleans Oil & Gas Corporation, capitalized at $500,000, has drilled in a small well forty-five miles from the city in the Terrebonne Parish. The officers of the new concern are: F. H. Wickett, of Chicago, President; Governor, J. N. Gillett, of California; S. J. Aikens,

The man of thought strikes deepest and strikes safest.—Savage.

of Denver, Co.; Senator Key Pittman, of Nevada, and W. E. Lawrence, of New Orleans, directors.

Ouachita Parish

In Ouachita Parish the Central Company, Inc., completed a 15,000,000-foot gas well at 2,150 feet in No. 2 on the Cole property, Section 31-20-4, and Nelson, Inc., completed a 3,500,000-foot well in No. 1 Smith land, Section 33-19-4.

OHIO—Ashland County

In Hanover Township, the Ohio Fuel Supply Company drilled a fair gas well in a test on the J. P. Moerz farm, Section 25, and one a little larger in a second test on the A. and J. Strickler farm, Section 18.

Columbus

The Ohio Fuel Supply Company, it is reported, will build a five-story fireproof building on the northwest corner of Elm and Front streets. The building will be of reinforced concrete construction with an exterior of brick and tile.

Coshocton County

In the deep sand territory in Southeastern Ohio, located near Brinkhaven, New Castle Township, the Logan Natural Gas & Supply Company has drilled a test on the Charles Fry farm through the Clinton sand. It is a gasser with a light showing of oil.

Elyria

The Citizens Gas & Electric Company has notified its consumers that during the coming winter, no family may consume over 35,000 cubic feet of gas per month. Factories and other consumers, not domestic, will be cut off before the above order will become operative.

Findlay

Several very good wells have recently been drilled in by the city in the local field.

Medina County

In Lafayette Township, the Ohio Fuel Supply Company drilled a large gas well in No. 2 on the Paul J. Warner farm, Section 11, and a light gas well in a test on theJohn Mong farm, Section 24.

Kundtz & Hulse drilled in a fair gas well in a test on the Mary J. Young farm, Section 33.

In Medina Township the Ohio Fuel Supply Company drilled a fair gas test on the J. A. Witzel farm, in Lot 68. In Westfield Township, the same company made a location for a test on the Morris Mead 110-acre farm, Section 18.

Miami

The Ohio Fuel Supply Company has acquired by purchase the properties of the Miami Valley Gas & Fuel Company. The sale price was $312,500.

Newport

Leases having been secured by the Louisville Oil & Development Company on 35,000 acres of land in Pulaski and McCreary counties.

Otsego

The Otsego Gas Oil Company has elected officers and directors as follows at the annual meeting: Richard Boyce, of Zanesville, President; C. W. Buker, Otsego, Vice-President; C. R. Bradford, New Concord, Treasurer, and John Ridgeway, Otsego, Secretary. The directors are A. H. Lane, of Otsego; George A. McLaughlin, of Marietta, and J. G. Shirer, of Newark.

Springfield

The Springfield Gas Company is completing plans for the construction of a regulator house in Snyder Park near the Main Street entrance. It is planned to have a man at hand constantly to watch the regulator and take proper action when the supply is insufficient.

OKLAHOMA—Bartlesville

Women with training in geology are being sought by the sub-surface branch of the Department of Geology in this city, to fill vacancies caused by the drafting and enlistment of men. The employment of women for this work in the Empire Gas & Fuel Companies was begun in January when Florence Travis of Chicago and Dorothy Aylesbury of St. Louis became office geologists in the sub-surface branch.

The Empire Gas & Fuel Company of the Doherty organization has established a school where the boys and girls in the messenger service, and others, may become competent short-hand writers and typists, thus fitting themselves for advancement in the company's service.

Carter County

Development work in an undeveloped section of the county has proved very profitable, a well said to have a production of 20,000,000 cubic feet pe day having been drilled in recently.

Cleveland

This city is inviting natural gas interests to bid on supplying the municipality with gas.

Cotton County

In Section 22-1s-10w, Keys and others in No. 1 on the Smith farm, in the southwest corner of the southeast quarter have a 40,000,000-foot gas well from sand at 2,217 to 2,222 feet.

Enid

The Oklahoma Gas & Electric Company, Enid Division, has closed contracts with the Oil State Refining Company covering its requirements of natural gas. Approximately 300,000 cubic feet per day will be used. Thirty new residences are being erected in Enid, all of which will be served by the Oklahoma Gas & Electric Company without the necessity of extensions of electric lines or gas mains.

Haskell District

The Oklahoma Natural Gas Company, Peterson & Carlin's No. 9, on the J. Harrison farm, in Section 17-15-16, is good for 8,000,000 feet of gas, which will be used for the lease. It comes from sand at 1,285-95 feet. The Caney River Gas Company got a 2,000,000-foot gas well at 1,284-95 feet in No. 2, on the J. McIntosh farm, in the center of the north line of the southeast of the southeast quarter of Section 20-15-16.

The Five Hundred Oil & Gas Company's No. 1 on the Alice Woodal farm, in the northeast corner of the southeast of the northwest quarter of Section 20-15-16, is estimated by its owners to be good for 10,000,000 feet of gas daily. The gas comes from sand at 1,243-55 feet.

Error of opinion may be tolerated where reason is left to combat it. Jefferson.

Natural Gas and Gasoline
JOURNAL

SUBSCRIPTION—
$2.00 IN THE U. S.

CONTENTS FOR AUGUST, 1918

VOLUME 12
THIS NUMBER 8

PUBLISHER'S NOTICE

PUBLISHED MONTHLY.

Advertising Copy should be in by the 15th of month previous to issue.

ADVERTISING RATES on request.

CORRESPONDENCE IS SOLICITED from all those interested in Natural Gas and kindred industries.

Buffalo Long Distance (Day) Bell Telephone, Seneca 3295-W.

Cable Address:—"Publight, Buffalo."

Address General Correspondence, Editorial and Advertising Matter to Central Office.

PUBLISHED BY
PERIODICALS PUBLISHING CO.,
68 West Huron Street,
BUFFALO, N. Y.

LUCIUS S. BIGELOW, *President and Editor.*

HARRIS S. BIGELOW, *Secretary.*

Entered as second class matter December 1, 1910, at the Post Office at Buffalo, New York, under the act of March 3, 1889.

CONTENTS OF THIS ISSUE

INDEX OF PAST 1918 ISSUES

WHAT WOULD YOU THINK OF A MANUFACTURER —

—who wrote to you with a stub pencil—"We are saving much money because we do not use typewriters and telephones?" You might well wonder whether his merchandise was as much out of date as his business methods.

You know that modern time and labor saving appliances are not added expenses, but that they have superseded slower and more costly processes.

The concern that uses your business paper to tell you its business story is simply making it easier for you to buy intelligently with the least waste of time on your part and theirs.

For the right kind of advertising shortens the distance between human minds just as certainly as the railroad has shortened the distance between places. It is still possible to walk from New York to Chicago, and it is still possible for a business to get along without advertising, BUT—

—don't forget that the seller who does not advertise, is not only paying for the results that such advertising would get him, but he is also *paying more than necessary.*

Progressive advertisers are progressive merchandisers and it pays to do business with them.

OUR SUGGESTION.

In these days of high railroad fares, high cost of living at hotels, and other abnormal costs attendant upon traveling to sell goods, we urge the plan adopted by certain well organized concerns, viz: *advertise to a larger extent than heretofore, allowing the advertisement to plow and harrow the soil, and sow the seed,* using the traveling representatives of a concern to go personally into the field to harvest the crop and to close such direct prospects as may have been focused through attractive advertisments bringing inquiries.

Don't *let-up* on seeking orders by personal solicitation, but *ease-up* by doing *more advertising,* while experienced men are unavailable for traveling positions, and while the expense of traveling is so great.

Let advertising play the part of *introducer* of your appliances, and be for you *a follow-up system* to keep your appliances constantly before possible buyers of whom you know, and before possible buyers who will see your advertisements, yet of whom you, *as yet,* know not.

Lucius S. Bigelow

FROM THE PEN OF THE EDITOR

ADMINISTRATIVE ORDER NO. 34.

The Following Order Appears as Recorded at a Regular Session of the Public Utilities Commission of Ohio, Held at Columbus, Ohio, on the 21st Day of May, 1918.

THE Public Utilities Commission, having under consideration the probable inability of natural gas companies to furnish an adequate supply to all their consumers during the coming winter, and the necessity of formulating more definite rules for the guidance of such public utility companies in disconnecting industrial and other consumers from the service, when necessary, during an emergency, to conserve the supply for domestic consumers, and the order in which disconnection should be made, as well as the order in which the service should be restored when the emergency is passed, hereby adopts the following rules and regulations, to wit.:

1. That for the purpose of disconnecting or curtailing service to consumers during an emergency, all consumers of natural gas are divided into two general classes namely: Domestic Consumers and Industrial Consumers.

2. That domestic consumers, for such purposes, include the users of natural gas for heating, lighting and cooking in private homes, boarding houses, and apartment houses, and users of natural gas for lighting and cooking only, in hotels, restaurants, bakeries, eating places, club houses, hospitals, and other charitable institutions.

3. That all other consumers shall be designated as "Industrial Consumers"; but for the purposes of disconnection or curtailment during an emergency, the following subdivisions of industrial consumers may be made, in cases where there is more than a sufficient supply of gas for domestic consumers as herein specified, but not a sufficient supply for all industrial consumers:

A. Users who are not included in the domestic consumers class, as herein specified, but who are engaged in preparing or preserving foodstuffs, or food producing plants, for such purposes only.

B. Industries directly engaged in manufacturing or producing war materials, for such purposes only; and users of gas in gas engines.

C. All other industrial consumers.

When there is not sufficient gas for all industrial consumers, as herein defined, the surplus shall be furnished to industrials in the order above named.

4. This classification is subject to the following exception: Where natural gas is being used in limited quantities for scientific, experimental, or mechanical purposes, and where other means of producing light and heat for such purposes cannot be reasonably substituted, an amount essential to such use, but not to exceed five thousand (5,000) cubic feet per month to each consumer so engaged may be used for such purposes only, and as if they were included in the class of domestic consumers herein specified.

5. If, after disconnecting all industrial consumers, there is not a sufficient supply of gas for the domestic consumers, then all boilers and furnaces not provided with gas fixtures and appliances primarily designed for burning natural gas as a fuel shall be disconnected; and if it becomes necessary to further restrict the use of gas to meet the emergency, domestic consumers may be limited to the use of thirty-five thousand (35,000) cubic feet per month, in one building, or for one family.

6. A copy of these regulations shall be furnished by each natural gas company to its consumers not later than June 15, 1918.

7. Consumers who do not promptly disconnect or curtail, in accordance with these rules and regulations, when notified by the utility that it is necessary so to do, shall, upon discovery, be wholly disconnected from the service until the emergency is passed.

SALES MANAGER OF ALIEN PROPERTY.

MR. JOSEPH F. GUFFEY, late president of the Natural Gas Association of America and until recently on the petroleum committee of the Council of National Defense, was lately appointed Sales Manager of the Federal Selling Corporation, to have charge of the actual disposition of the German owned corporations disposed of in this country.

Mr. Guffey will supervise all of the details, and his office will be in New York City, though his residence is in Pittsburg. He is working in co-operation with an advisory committee and a Washington committee in all things connected with any sale and in all matters that may arise before any property is actually turned over to the purchaser.

The advisory committee named by Mr. A. Mitchell Blinn follows: Chairman, Otto T. Bannard of the New York Trust Company; former Justice George L. Ingraham of the appellate division of the New York Supreme Court; Cleveland H. Dodge, New York banker and philanthropist; Benjamin H. Griswold, Jr., banker of Baltimore, and Ralph Stone of the Detroit Trust Company.

He that has patience may compass anything.—Rabelais.

West Virginia Meeting

The West Virginia Natural Gas Association Holds Meeting at Huntington, July 24-25

THE biggest and best gas meeting of the West Virginia Natural Gas Association was pulled off at Huntington [illegible] on the 24th of July. It was [illegible] there [illegible] gas and [illegible]

The meeting [illegible] Huntington was [illegible] Heretofore it has been all gas [illegible] this year it was thought best [illegible] these [illegible] in order that the [illegible] might be presented at one and the [illegible] and gas men of West Virginia [illegible] address [illegible] being sufficient [illegible]

The meeting was a pattern [illegible] whose interests are [illegible] upon the [illegible]

The new [illegible]

President H[illegible]

Vice-President W[illegible]

Treasurer [illegible]

Secretary [illegible]

[illegible] Fitzgerald [illegible]

[illegible] West [illegible]

There was [illegible] prepared was as [illegible]

WEDNESDAY [illegible]

Morning

Convention called to order [illegible]

Address of Welcome

Mayor of Huntington

Response

Charleston, W. Va.

President's Address

Afternoon

Convention called to order at 2 [illegible]

Address by [illegible]

Governor [illegible]

Address [illegible]

[illegible] Natural Gas [illegible]

[illegible]

Paper [illegible]

[illegible] State of West Virginia

THURSDAY, JULY 25

Morning

Convention called to order [illegible]

Paper [illegible]

[illegible]

Goodness does not consist in greatness, but greatness in goodness.—Athenaeus.

FACTS ABOUT THE NATURAL GAS INDUSTRY IN WEST VIRGINIA.

BY EDWIN ROBINSON.

THE producer, transporter and distributor of natural gas have been given public attention and criticism as to the manner in which their business is conducted from the incipiency of the natural gas industry.

In the early stages of the business little or no attention was paid to the leakage, defective pipe line laying or bad plumbing in the consumer's residence.

Gas in those days was plentiful and the markets scarce. As everybody was after oil, gas was considered of little value and a great amount of it was allowed to go to waste.

Along about 1902 the possibilities of West Virginia's natural gas resources became evident to some of the larger producers, leasing of territory began in earnest, leases were drawn more carefully, the drilling of wells was begun, locations were made miles apart for the purpose of testing the scope of the gas belt.

When gas was found in large quantities in scattered districts, it was then that the industry was put upon a business basis. Careful records of everything done, every formation and strata through which the drill went was noted.

Conservation, which heretofore was unknown, was being practiced in a primary way by some of the larger companies. It was not long after this that the gas companies began in earnest to see that gas once in the line should go to the consumer.

Leaks were stopped, line walkers were started in all directions to note any leaks, the condition of the lines or the probable chances of a slip or land slide. And this is in practice today.

Now, efficiency experts, geologists, engineers and chemists and every known device and invention for the betterment of the service have been adopted.

Some gas companies that formerly used gas for driving the gas compressors have installed boilers, opened coal mines that more gas could be delivered to its customers.

The amount of gas used under boilers for drilling wells was one hundred and ten thousand cubic feet every twenty-four hours, now thirty-five thousand cubic feet is used.

Everything is being done to conserve gas by the producer. The State has passed laws and the Public Service Commission rules to regulate the gas company in the conduct of its business. Reports of its business, in many of the most minute details are made, pressures in cities are reported, in fact everything about its business is known to the Administration at Charleston.

There is no objection to this—all the gas people ask is fair treatment and to be treated like other people and corporations. I will say that our relations with the Public Service Commission and the Administration and its departments have been most cordial and fair.

Conservation by the consumer has not yet begun. He has not made any appreciable effort to improve the use of gas in his home, for I believe that ninety per cent. of the appliances used in the homes in West Virginia where natural gas is used as a fuel are the same that were originally installed twenty to twenty-five years ago.

There has been no attempt on the part of the consumer to insist upon modern appliances properly installed that will save gas and reduce the gas bill.

A great many companies have men whose only duties are to see that their customers burn gas in the proper manner and not waste it. If this method was adopted by all of the distributing companies and the consumers would not object to installing modern devices and appliances the amount of gas saved would take care of considerable of the shortage that occurs during the extreme cold weather.

There is another class of consumers where conservation of gas is unknown. I am speaking of the free consumers. We can cite an instance in West Virginia where a free consumer used one billion cubic feet of gas in one month in his residence. This should be sufficient gas for one hundred consumers for the same period.

A great deal of this waste comes from the training and conditions incident to the early use of gas. From the beginning of the business until within a very short time ago natural gas had but little commercial value except as a bait for locating industries by offering free gas for a term of years or at a rate so exceedingly low to amount to almost the same thing.

In West Virginia the earlier investors in the natural gas business followed in the footsteps of the Northwestern Ohio producers by making it incident to the real estate business.

Along about that time the Ohio and Indiana gas fields were exhausted and a number of industries that were seeking locations where gas was plentiful and cheap, turned their eyes to West Virginia.

The manufacturer from Ohio, Indiana and Pennsylvania looking for cheap gas had never been trained to conserve in any way or to use any modern methods or appliances. The price of gas was so low that no attention was paid to the amount consumed. The gas men encouraged this for the bills were larger.

Today to a certain extent this is true for the reason that the majority of the industrial consumers have no idea as to the value of the commodity nor realize the importance of conservation.

The low price of natural gas has had more to do with the waste and careless use of it than anything else.

Whenever the price of gas reaches the point of its value as a commodity both the industrial and domestic consumers will use every known device and appliance for getting every possible heat unit out of it.

The exceedingly low price for gas offered by producers, Boards of Trade or Real Estate men attracted to the towns one class of manufacturers, with few exceptions, namely those engaged in the manufacture of glass. Then came the carbon black maker, who fol-

He who bridles the fury of the billows, knows how to put a stop to all the secret plans of the wicked.—Racine.

Be not careless in deeds, nor confused in words, nor rambling in thought. — Aurelius

being in the rural districts where advantages were crude, schools poorly conducted and situated great distances apart.

It was necessary for the oil and gas companies to secure men capable and reliable (and it takes capable and reliable men to conduct either of these industries) to have improvement made in the country schools or these men would not move their families where their children did not have the advantages of an education.

The natural gas industry has brought to West Virginia millions of dollars in its development.

The amount expended annually by the natural gas industry for rentals and royalties is in excess of five million dollars in sums ranging from five dollars to five hundred dollars annually.

This money is distributed to land owners in the thirty-two oil and gas producing counties of the State. The annual expenditure for operating, rig building, teaming, drilling, labor, pipe. casing, fittings, supplies, maintenance, etc., is many times more than paid out for rentals and royalties.

Fifteen years ago there were liens or mortgages on fifty per cent. of the farms in the oil and gas districts, today there are not two per cent.

There is one county in the State in which five-sixths of all the taxes are paid by the oil and gas industry.

Another interesting thing about this industry ninety-five per cent. of its employees are native West Virginians.

The natural gas utilities have an assessed valuation for taxation of more than one hundred million dollars, as assessed by the Board of Public Works, and pay taxes on this amount.

The entire oil and gas business of the State pay not less than one-eighth of the entire taxes of the State.

The increase in land values, the improved schools producing counties of the State can be attributable to producing counties of the State can be attributable in a very large extent to the oil and gas industry.

CONVENTION OF TEXAS GAS ASSOCIATION.

THE third annual meeting of the Texas Gas Association will be held at Fort Worth, Texas, September 10th and 11th. The headquarters will be the Westbrook Hotel.

The program of papers is as follows:

"Public Utility Conditions in the Southwest," M. T. Walker, Manager, Beaumont Gas Light Lompany.

"Gas Heating," A. L. Knies, Manager Austin Gas Light Company.

"Oven Temperature Regulation," by C. K. Enos, National Stove Company, Lorain, Ohio.

"Natural Gas Gasoline," E. J. Raisch, T. P. Coal Company, Thurber, Texas.

"The Factors Limiting the Production of Toluol," P. E. Nicholls, Superintendent, Galveston Gas Company.

Write Mr. O. K. Shannon of the Fort Worth Gas Company in connection with reservations.

PETROLEUM, ASPHALT AND NATURAL GAS.

THE Kansas City Testing Laboratory is conducted with a view to arriving at conclusions only through thorough tests, not at haphazard. Careful analyses are required covering whatever the research may be, whether in chemistry or other scientific fields, or along mechanical lines.

An exceedingly comprehensive work has been published by the Laboratories, known as "Bulletin 14." The same is copyrighted by Mr. Roy Cross of the Laboratories.

The table of contents of the work occupies six pages, and is excellently compiled. There is an index which enters thoroughly into the details of the work, and fills fifteen pages. Each subject in the index is subdivided, in some cases as many as twelve to fifteen sub-divisions appearing. Thus it enters into details in a way to add greatly to the work as a practical and ready-reference book.

There are eighteen pages of blank space, each page headed with the word "Notes." These pages are for memorandum purposes and will be found very convenient for those who would wish to make memorandum in permanent form. There are many pages in tabular form covering an infinite variety of data required by those handling subjects pertaining to petroleum, a-phalt and natural gas. This work will be found of great value to every practical man or field operator.

McCORMICK INTERESTS DEVELOPING.

MR. W. B. McCORMICK (Terrebone Gas Company, Houma, La.), has the assistance and cooperation of W. H. Sedberry, formerly Manager-Secretary-Treasurer of the Marshall Gas Company of Marshall, Tex. Mr. Sedberry recently resigned from the Marshall Company, leaves very pleasant friendships there to take up active work in Mr. McCormick's interests which he has been in direct touch with for quite a long period.

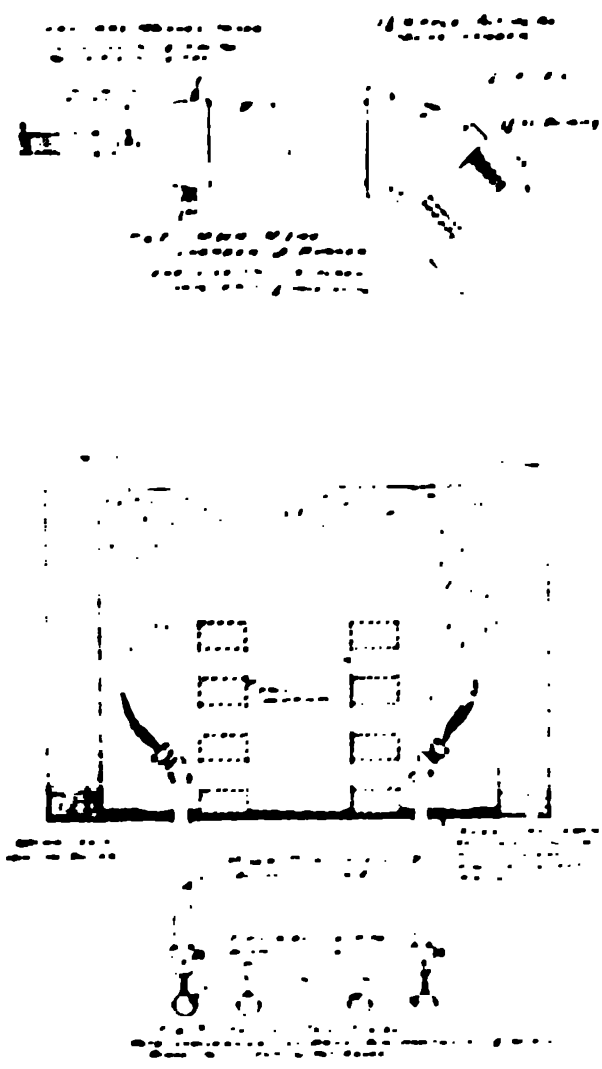
This is not a "try-out" with Mr. Sedberry or Mr. McCormick. It is simply a consummation of former touch in these business matters. We congratulate both Mr. McCormick and Mr. Sedberry.

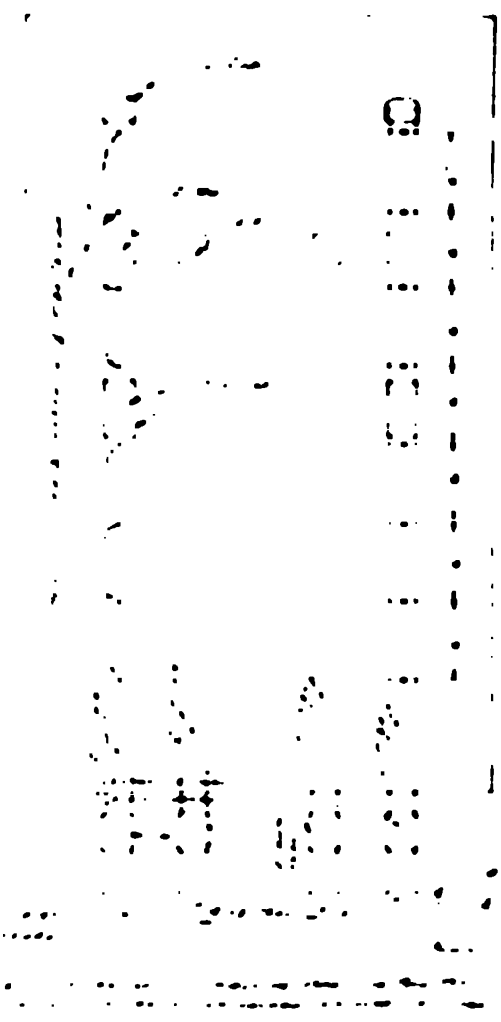
RAILROADS MORE DEADLY THAN KAISER'S BULLETS.

American railroads are far more deadly than German bullets. A comparison of the casualties in the American expeditionary forces with an interstate commerce commission accident report covering the first quarter of 1917, shows that. as against 476 American soldiers killed in action to date, 1,152 passengers lost their lives in railroad accidents in the first three months of last year. Deaths in the expenditionary forces from all causes total 2,260. The railroads list of deaths in train accidents in the three months' period totals 3,365 persons, including passengers and employes.

A wrong-doer is often a man that has left something undone, not always he that has done something.—Aurelius.

INSTALLATION FOR BURNING NATURAL GAS UNDER BOILER





The brain may devise laws for the blood but a hot temper leaps o er a cold decree Shakespeare

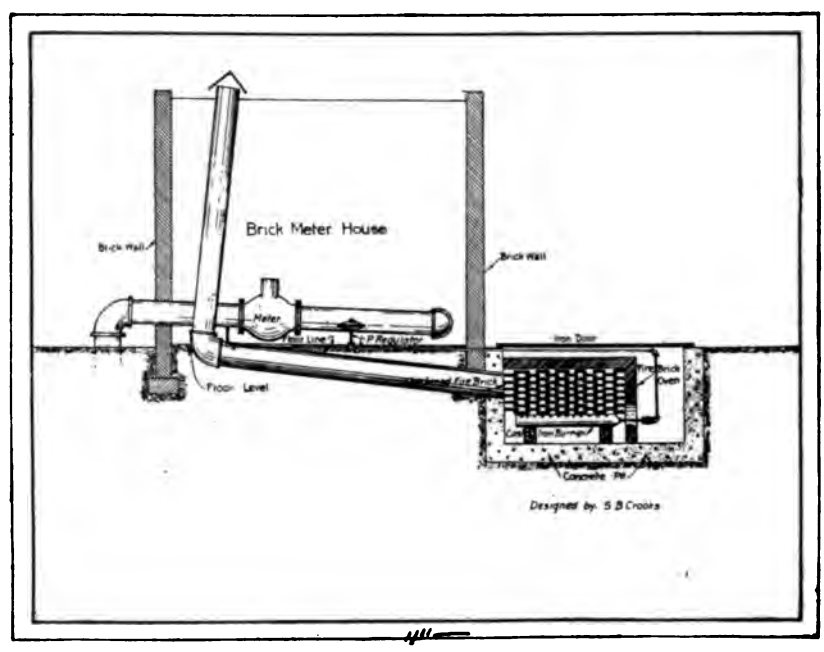
found to increase the efficiency. It also shows the "grate" of sheet iron covered with fire-clay to keep out excess air. There are holes in the iron for the 1¼" mixing chambers to pass up through.

The arrows in the drawing show the path of the burnt gases—always in direct contact with the water surfaces. Therein lies the reason for the high efficiency of this setting.

If the boiler is running under capacity, it is possible to shut off one, two or three of the four sets of burners. The writer usualy shuts the rear sets off first, on account of the longer travel of the hot gases from the front burners.

HEATER FOR TOWN BORDER METERS.

Designed by S. B. Crooks, Asst. Gas Pipe Line Dept., Wichita Natural Gas Company, Bartlesville, Okla.



HEATER FOR TOWN BORDER METERS.

A simple, but absolutely safe heater capable of close regulation:

In building this particular heater the 6¼" junk casing running from the furnace to the roof was first put in place. The concrete was poured around it for the furnace pit. The meter house had a dirt floor and the heater pipe was left uncovered along the horizontal run. This trench can be covered, if desired, with a grating.

The regulator in the fuel line holds a constant pressure at the throttle valve which prevents variation in heat due to pressure changes at the meter. The iron door being locked down prevents tampering with burner.

In later installations the furnace will be built on the ground instead of in a pit as in this case, this will permit of the heater pipe being installed level and above the floor of the meter house.

WHAT THEY MUST DO SHOULD GAS FLOW STOP.

H. H. Hall, The Ohio Fuel Supply Company, Columbus, O.

In our smaller towns, where we would not be justified in employing a man for that town only, we pay a small amount to someone, generally the village blacksmith, or store keeper for changing the chart once a week on our regulator.

In order to impress on them what to do in an emergency, the following notice printed on 10"x14" cardboard and framed has been hung in all regulator houses.

IF, FOR ANY REASON THE SUPPLY OF GAS SHOULD STOP

1st—Shut the gate ahead of low pressure regulator.

2nd—Notify EVERY consumer to turn off all stop cocks at lights and fires. and in case a consumer is not at home, shut off gas at curb or meter.

3rd—When pressure again is sufficient in main line, open gate slowly and allow gas to go into town lines.

Be SURE everything is safe.

THE OHIO FUEL SUPPLY CO.

FOR STARTING A TAP IN DIRECTION DESIRED.

Murray Strong, Foreman, Arkansas Natural Gas Company, Arkadelphia, Arkansas.

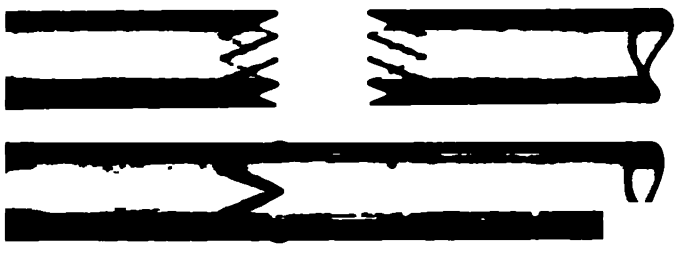
Attach a saddle of the right size firmly to the place where it is desired to make the tap. Screw the tap into the saddle. which acts as a guide for the tap.

Using the saddle as outlined above overcomes all difficulty of starting the tap true.

Custom is almost a second nature.—Plutarch.

GATE SEAL FOR SMALL GATES

TO GIVE ADDITIONAL STRENGTH TO WELD



TO TRANSFER LEASE HOLDINGS TO MAP

ALWAYS USE YOUR HEAD

The sign brings customers De La Fontaine

Business Laboratory

United States Methods for Systematizing Departments and Accomplishing Efficiency Results by Herbert D. Brown, Chief U. S. Bureau of Efficiency.

THE work of the United States Bureau of Efficiency resembles in part the work of efficiency men in the commercial field and in part presents aspects peculiar to itself.

Its particular task is to introduce modern and efficient methods into various branches of the Government service. It has to make the usual study of difficulties and reach solutions along unusual lines. This is what all efficiency workers find themselves called upon to do.

But in the second place, this bureau has found it necessary to work out a peculiar procedure of its own in order to overcome the inertia that prevails in most government departments. It not only is required to submit plans for cutting away the barbed wire entanglements, but it often finds it necessary actually to blast away the obstacles by its own efforts.

To illustrate the first point the Bureau of Efficiency was called upon to devise a method of recording requisitions for a large number of different kinds of supplies. To meet this problem it introduced the use of a 17-bank duplex adding machine with an 18-inch carriage.

In another division it was asked to find a method of registering the issue of documents in numeric sequence and at the same time of registering payment in an irregular audit. In the course of the solution of this problem it was found necessary to distinguish the entries of payments in the current month from the entries of payments in preceding months. The plan hit upon was the use of an ink which would write one color (red) when finished, and turn another color (black) after three or four weeks.

In another office the bureau installed addressing machines with special devices that the manufacturers required about four months to perfect. Again, members of the staff worked out a plan to send an important series of documents to one office for recording and cost checking instead of through several offices, at a great saving of time and clerk hire.

The foregoing examples will be recognized as typical of the usual tasks efficiency engineers are called upon to perform—introducing labor-saving devices, chopping away antiquated methods, and routing work. Such schemes, together with new accounting systems, form the bulk of the work of the Bureau of Efficiency.

Now comes the part of the procedure peculiar to our field of operation. The introduction of efficiency methods into government offices is almost always difficult. In the commercial field efficiency engineers are usually invited into a plant or factory and are given the benefit of enthusiastic co-operation.

In the government service, officials are for the most part content with present practices; they are not eager to experiment with new methods.

It is hard, indeed often impossible, to get a change adopted on a mere report, no matter how beneficial the suggested changes might appear. To overcome this passive and sometimes active resistance, the Bureau of Efficiency has created a special procedure. It undertakes to dredge a channel through government lassitude.

After a plan which this Bureau considers adequate has been mapped out, the Bureau turns itself into a business laboratory for developing and testing the plan. It endeavors to reconstruct completely the offices studied. even with its field branches.

If, for instance, it be dealing with a department that handles considerable money, it creates the whole routine of that department's financial transactions. It carries those transactions through with dummy checks, adding machines, ledgers, bookkeeping machines, and so on, reproducing the actual routine as closely as possible.

It continues this test until it is convinced that the new procedure will work smoothly and will secure the efficiency for which it is designed. At this point the officials of the office being studied are consulted and told of the proposed changes. Very often they say these plans sound all right, but they will not work. We are able to reply, "Come over to our Bureau and see them work. We have them in actual operation." The officers are invited to supply difficulties in the material and the procedure is gone over again and again until every contingency has been met.

After this office trial, the second step in our procedure is taken—installation. The Bureau of Efficiency sends a part of its staff into the office it seeks to help, equipped with its tested plans. It supercedes for the time being the regular employees. It takes over the actual business of the office. It makes an effective demonstration of its plans. It supplies concrete proof that the plans will work. It leaves the recalcitrants high and dry.

Into one large government office the Bureau of Efficiency sent a force of thirty skilled adding machine operators, bookkeepers, accountants, and sorters who took over all the work and ran the office for several weeks. They continued at the task until all the details of the new method had been reduced to perfect running order.

Always the chief emphasis is placed, first on long, severe, and painstaking experiment in our office, and second, on a thorough-going installation of the tested system under actual conditions of operation.

Cowards do not count in battle; they are there, but not in it.—Euripides.

Results of Interesting Experiments

Set Forth in a Paper by Charles V. Critchfield, Entitled, "The Value of Gas Delivered at Varying Pressures", Followed by Discussion.

A

Nothing happens to anybody which he is not fitted by nature to bear **Aurelius**

ernor to secure a steady flow of gas, the calorimeter proper, a set of scales, two copper water pails, and a number of short lengths of rubber tubing. Named in the order of the gas travel comes first the governor, which is in construction a miniature prover, automatic in action, with the bell weighted to give the desired pressure and having its inlet connected by a small rubber tubing to the gas supply and its outlet similarly connected to the small meter. This type of meter differs essentially from the ordinary meter in that a drum, made up of several compartments, revolving partially submerged in water, takes the duty performed by leather diaphragms in the commercial meter. The outlet of the meter is connected by flexible tubing to the gas burner located at the bottom and within the calorimeter. The calorimeter proper is a hollow cylinder so constructed that water may readily flow around a central passage through which the heat from the burner passes. A thin wall separates the water from the warm air within and, consequently, rapidly absorbs whatever heat is transmitted to the air by the gas burner. The temperature of the cold water entering the calorimeter is indicated by one thermometer and, as it passes out, by a second, indicating the temperature to which the gas flame has raised it during its travel through the calorimeter. As the water leaves it is caught in one of the copper pails and accurately weighed. Usually the amount of water used in each test is whatever will flow through the calorimeter while the burner is consuming 1/10 foot of gas. Ten turns, or tests, are made to give an average of 1 cubic foot.

Three factors enter into the test, viz., a cubic foot of gas measured by the meter, the weight of the water, and the difference in temperatures of the water as it enters and leaves the calorimeter. The product of these three, with some slight modifications, determines the amount of heat contained in a cubic foot of the gas burned, so by the use of this instrument the comparative heating values of various natural and artificial gases for domestic and industrial purposes can be very accurately ascertained.

REGULATORS

A gas regulator is a device both to reduce and maintain a regular gas pressure. A familiar form operates upon the same principle, to use an illustration familiar to all, of the lever and the fulcrum. If a bar of steel is laid across a small solid substance, which we will call the fulcrum, in such a way that the fulcrum divides the length of the bar unequally, we know that a small downward pressure on the long end of the bar will exert a very considerable upward pressure on the small end of the bar. In a gas regulator the low pressure gas, after it has passed through the regulator, exerts a back pressure on a large movable surface called a diaphragm, sufficient to equal the force of high pressure gas on a much smaller surface, called a valve. The object in using regulators is the necessity to reduce the pressure of gas as it issues from wells or long pipe lines to an extent that will permit the use of gas with safety in appliances in the homes.

DOMESTIC METER

The ordinary gas meter is a device for measuring and registering gas passing from the gas main into the consumer's premises. While men and women are familiar with the outside appearance of the ordinary domestic meter with its tin or iron case and registering dials, few have any conception of its interior mechanism and a brief description may be of interest to the reader.

I will describe the older and more familiar make known as the case diaphragm type. Within the tin body or case are two compartments, a large lower and an upper and smaller compartment. The lower contains two leather diaphragms, the upper the valves, gears, and the "clock" or registering device. Each meter has two outside openings, otherwise it is gas tight. One of these openings admits gas from the street main into the meter, the other opening is the outlet through which gas passes from the meter into the house lines. The principle on which the meter operates is somewhat similar to that of another familiar device, viz., the blacksmith's bellows. As the blacksmith opens the bellows air is drawn in, and as he closes this huge leather bag, the air within is forced out into the forge. So in the meter, these two leather diaphragms take the place of two miniature bellows which alternately fill with gas from the main and, in turn, close, forcing the gas onward into the house pipes. The blacksmith's arm is the power operating the bellows at the forge, the pressure of the gas is the force operating the diaphragms. Certain arms and rods attached to these leather diaphragms project upwards into the upper compartment and connect to the valves and registering mechanism. As there are two diaphragms the flow of gas through the meter is continuous. As one of them fills, the other discharges and, through this cycle of expanding and contracting, the hands on the dials are propelled so that each time one of these little leather bellows empties its content of gas, the dial hand is moved a small degree.

These leather diaphragms must hold just so much gas and no more, otherwise they will either turn the dial hand too far or not far enough, consequently great care is used in making these diaphragms. In fact, the accuracy of the meter depends almost wholly on the size and pliability of these leather bags.

Since the creation of the Ohio Utilities Commission, six years ago, it has been a part of my duties to inspect and test many domestic meters and, taking into consideration the conditions under which meters operate, as they are exposed to the action of the gas within and heat, cold and moisture without, I can safely say the gas meter is the most reliable measuring apparatus made.

I have, in as simple language as possible, described the Meter Prover, Calorimeter, Regulator and Domestic Meter, all four of which were used in some simple experiments to determine to what extent pressure influences the value of natural gas to domestic consumers.

The natural phenomena of contraction and expansion of gas works a blessing on the one hand and a menace

It is good to live and learn. Cervantes.

e other. The fact that large quantities of gas may ompressed into small volumes permits its transporta- over large distances and makes it possible for cities reds of miles removed from the source to be supplied apparent ease. As this contraction of volume by ressing can be controlled at the will of the Utility, the term "blessing". But when the Utility releases distributing system this compressed gas, it loses l, and the other phenomenon of expansibility take limited in its action only by the joint use of the y's patrons. In other words the response of the confined in the mains to expand itself to a volume

ERANGEMENT OF METERS AND REGULATORS.

will meet the simultaneous requirements of every mer served, results in dissipating the pressure to a degree as to impair the service to all.

plays no favorites but goes wherever wide open welcome its expansive character. Nature abhors a m and every foot of gas unrestricted tries to fulfill e's law.

gas consumers are interested in just two things— the results obtained in terms of heat, light or r; second, the amount (cost) of gas used in obtain- uch results. With some the first is of major im- ance, with some the second—many both. But with e public verdict for poor results and high cost is, sually, low pressure.

To return to the subject of the value of gas at varying pressure, I call attention to the accompanying cut illustrating a simple, and I believe a reliable method of ascertaining by actual measurement the amount of expansion due to the reduction of pressure.

This view shows two 10 ft. meter provers rigidly connected by a short length of ¾ in. pipe. Prover No. 1 has its bell weighted to a pressure of 4 oz. per sq. in. Prover No. 2 has its bell weighted to a pressure of 1 oz. After thoroughly purging both the provers, No. 1 was filled with gas and then allowed to force its contents into Prover No. 2. As the scale of Prover No. 1 indicated a transfer of 8 cu. ft. of gas, the scale of Prover No. 2 indicated 8.125 cu. ft., or an expansion of 1.56%. To check this test the provers were reversed, i. e., the pressure on Prover No. 2 was increased to 4 oz. and that of No. 1 reduced to 1 oz., with the same results. It will be noted that the percentage of expansion runs very close to the horizontal value and I believe with refined instruments, the results would coincide.

To make a similar demonstration, using domestic meters in place of provers, three meters were connected in series with some house regulators between. One was introduced into the first meter at 4 oz., reduced and passed into the second meter at 2 oz., and further reduced and passed through the third, or last, meter at 1 oz. The amount of gas registered in the third meter was 1½% more than by the first, while the difference between the first and second, and the second and third, was too slight to detect. The illustration shows the arrangement of meters and regulators except that, in assembling them for the photographer, the regulators were inadvertently connected onto the outlet instead of the inlet sides of the meters.

A further demonstration of the degree of expansion as expressed in heat units was secured in repeated tests by the calorimeter with natural gas under 4 oz. and 1 oz pressures. The loss in heat units when the pressure was reduced from 4 oz. to 1 oz. was so slight that it was covered up by the ordinary trivial errors made in the observations.

These three demonstrations prove conclusively that the amount of expansion following a lowering of pressures from 4 oz. to 1 oz. is very slight and, since domestic meters measure volumes irrespective of pressure, the increased amount of gas passing through and registered by meters at times when pressures are extremely low, is shown in the following table.

Based upon 1,000 feet of gas delivered to the consumer under a pressure of 4 oz., meter would register an additional amount over 1,000 feet as follows:

Pressure	Cu. ft.
4 oz.	1 000
3½ oz.	1,001.1
3 oz.	1,004.3
2½ oz.	1,006.4
2 oz.	1,008.6
1½ oz.	1,010.7
1 oz.	1 013.1
½ oz.	1,015.1

He who can take advice is sometimes superior to him who gives it.—Von Knebel.

Our experiments so far relate to the second item in which the consumer is interested, viz., the amount, or cost, of gas used. Passing to the first item, i. e., the results obtained in the appliances, our experiments relating to gas value at varying pressures would indicate that the unsatisfactory results of subnormal pressures are due, in the main, to appliances so inflexible that they operate efficiently, as well as economically, only at some predetermined pressure.

Two factors control the efficiency of the appliances. One has to do with the combustion, the other with the location where the combustion takes place. All domestic natural gas appliances are equipped with burners designed to produce what is known as a "Bunsen" flame. In order to burn natural gas efficiently it is necessary to support combustion by air. The quantity required is approximately ten parts of air to one of gas. In the usual form of burner gas is admitted through a central opening called an orifice, sometimes termed a "spud". Surrounding this orifice, which by the way has a diameter of a very small fraction of an inch, is a much larger passage through which the air enters the burner. Gas is forced through the orifice by a pressure and as it emerges it draws in a certain quantity of air which mixes with the gas and assists combustion. The air so drawn in is termed primary air. Additional air, called secondary air, originates around the flame, contributing to a more efficient combustion. The proportions of air to gas depend upon the relation of the gas orifice to the primary air passage at some known gas pressure.

The average gas consumer buys a kitchen range or hot-plate and puts it in service, assuming that the burners are complete and adjusted to efficiently consume every foot of gas furnished by the local gas company. To demonstrate what would happen to an average gas consumer, a two burner hot-plate was picked at random from the stock of a well-known manufacturer. This hot-plate was represented to be properly equipped and adjusted to efficiently burn natural gas furnished in a large city in Ohio on a pressure of 4 oz. The distance between the top of the burners and the top of the grid, or plate surface, was found to be 1⅛ in. and the burner was equipped with a No. 52 orifice and having the mixer shutter fully open. Connecting the hot-plate to the gas supply, natural gas of 1125 B. T. U., 6 pounds of water was placed in a new closed copper teakettle. A "well" had been previously soldered into the kettle into which was inserted a dairy thermometer. Test No. 1 shows the results obtained at from 1 oz. to 4 oz. pressures, with the burner as located by the manufacturer. Test No. 2 shows the results when the burner was lowered about 1 in. (⅞) in.)

DEMONSTRATION OF EXPANSION AS EXPRESSED IN HEAT UNITS.

The figures in the last clumn to the right are merely for the purpose of ready comparison, being the product of the rise in temperature, the gas consumed and the time. Two things will be noticed, first the quantity of gas varies much less than the time; second, the distance of the burner from the vessel affects results much more than does the variation in pressure. In my opinion no appreciable loss through low pressure results to the consumer through meter registration, but considerable loss indirectly follows from a sluggish flow of gas and attendant poor mixers, combined with short burner flames. To state this briefly and more intelligently would be to describe a situation wherein all the gas companies' consumers would

A man should be upright, not be kept upright.—Aurelius.

to divide among themselves the available supply, say, million feet, by a demand that required several hund thousand more to give their appliances, unadjusted, fficient supply for efficient operation.

and maintain a stable pressure, adjust all appliances to this pressure; buy, borrow or steal all the gas you can; make no more extensions; induce your customers to install combination heating appliances; educate your patrons to

TYPICAL CALORIMETER USED IN THE EXPERIMENT DESCRIBED

ARRANGEMENT OF APPARATUS USED IN TEST.

f I were to be asked what suggestions would you offer meet this situation, it would be to lower your normal ssures as far as your distributing system would permit

realize that the hey-day of gas production is behind them and that certain inconveniences naturally go hand in hand with a cheap priced fuel.

The lot assigned to every man is suited to him, and suits him to itself.—Aurelius.

TIME PASSING ONE CUBIC FOOT NATURAL GAS THROUGH VARIOUS SIZE ORIFICES AT VARYING PRESSURES.

	No.	60	58	56	52	48	46	44	42	40	38	34	30
	Diam.	.040	.042	.0465	.0635	.076	.081	.086	.0935	.098	.1015	.111	.1285
	Time	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s
Presure in ounces	½	33	27 30	23 30	13 20	9 40	8 25	8 05	5 30	5 10	5 05	4 40	4 00
	1	21 55	19 40	15 50	8 15	7 20	4 55	4 45	3 50	3 40	3 35	3 25	2 45
	2	14 40	13 45	11 20	5 50	4 15	3 40	3 30	2 30	2 25	2 20	2 05	1 45
	4	10 50	10 00	8 45	3 55	3 05	2 45	2 35	1 50	1 45	1 40	1 35	1 05
	6	8 50	8 05	6 05	3 25	2 30	2 05	2 00	1 35	1 30	1 25	1 20	0 55

Room and Gas 60 degrees.
Meter—Harris Bros., Philadelphia.
Appliance—Hot-plate No. 32, Sawed burner, Estate Stove Co., Hamilton, Ohio.

TEST NO. 1.

Orifice	Weight Water	Burner Distance	Gas Pressure	Water Rise From	Water Rise To	Net	Cubic Feet Gas	Time	
No. 52	6 lbs.	1⅛"	1 oz.	60 deg.	212 deg.	152 deg.	2.025	20′ 39″	381
No. 52	6 lbs.	1⅛"	2 oz.	55 deg.	212 deg.	157 deg.	2.17	14′ 52″	303
No. 52	6 lbs.	1⅛"	3 oz.	56 deg.	212 deg.	156 deg.	2.18	12′ 19″	251
No. 52	6 lbs.	1⅛"	4 oz.	56 deg.	212 deg.	156 deg.	2.30	11′ 18″	243

TEST NO. 2.

Orifice	Weight Water	Burner Distance	Gas Pressure	Water Rise From	Water Rise To	Net	Time	Cubic Feet Gas	
No. 52	6 lbs.	1¾"	1 oz.	60 deg.	212 deg.	152 deg.	2.20	22′ 20″	448
No. 52	6 lbs.	1¾"	2 oz.	58 deg.	212 deg.	154 deg.	2.37	16′ 39″	364
No. 52	6 lbs.	1¾"	3 oz.	56 deg.	212 deg.	154 deg.	2.475	13′ 47″	315
No. 52	6 lbs.	1¾"	4 oz.	54 deg.	212 deg.	158 deg.	2.48	11′ 46″	277

—Narural Gas Association Convention

DISCUSSION

J. F. MASON: I would like to ask Mr. Critchfield this question. What in your judgment is the proper normal pressure for a distributing system?

MR. CRITCHFIELD: That is a very difficult matter to say, as it depends largely on your local distributing system.

In a general way I would say that rather than carry pressures of six or eight ounces during seventy-five per cent of the time and be obliged to drop to one, two or three ounces during the remainder of the time, it would be very much better to lower pressures to a point within your ability to maintain without fluctuation.

While it is probably not germane to a discussion of this paper, I would like to add a statement or two relative to the natural gas situation in Ohio. Very recently I said to the members of our State Commission that the burden of furnishing an adequate supply of gas had shifted very largely from the gas utilities to their consumers; that gas production had apparently reached a maximum and the problem now confronting the producer is to maintain the output while the consumer was morally bound by economical appliances and equitable distribution to keep within the available supply. Unless we have an open winter, there will be a repetition of the experiences of last. There are but two chief forms of fuel —i. e.: coal and natural gas. The Federal Government will have full control of the distribution of coal and our Commission of gas. Every consumer in our state must have either gas or coal, and to my notion gas should always be used in preference to coal, since the latter can be stored and the former cannot, consequently it becomes the plain duty of every gas company to sell its maximum output every day in the month and every hour in the day and no regulatory body should issue orders so inflexible as to leave an undistributed surplus in the possession of any gas company where it could be substituted for coal.

MR. J. F. MASON: Assuming that the distributing plant is in normal condition and assuming that the necessities of the case required a lowering of the pressure in your judgment and from your research work, to what pressure would you recommend working down to?

MR. CRITCHFIELD: By the introduction of the proper kind of appliances, properly adjusted, I see no reason why natural gas cannot be distributed as low as two ounces.

W. Y. CARTWRIGHT: Mr. Critchfield you might refer to your experience at my house last winter.

MR. CRITCHFIELD: Mr. Cartwright has asked me to tell you about what happened at his house. That reminds me of an incident. Mr. Cartwright has in his home a very efficient heating apparatus. I am not advertising any particular kind of heating apparatus but

I believe this was made in the City of Cleveland. I know that during the intensely cold weather that prevailed in the country last winter I was in Cincinnati and examined the apparatus in Mr. Cartwright's house which was working so efficiently that I found that Mr. Cartwright was able to keep his house warm on one half inch of gas.

I think in the distribution of gas some poor results have been brought about through the practice usually followed when a Gas Company goes into a town and begins to pipe it and to lay services, it naturally will lay a big service into the big house and a little service into the little house and when you get down to low pressure the fellow in the big house is getting the gas and the fellow in the little house is not getting it. He is being stinted in his supply. Although it is running contrary to usual practice yet I believe that if you increase the size of the service—I won't say anything about decreasing the size of the service to the big house but if you increase the size of the service to the small house you are going to get away from a great deal of your low pressure troubles and under those conditions I cannot understand why there will be any difficulty brought about by lowering pressures down to two ounces.

HENRY C. MORRIS: I would like to ask Mr. Critchfield if in his judgment it is not going to be necessary for the gas range manufacturers to readjust their ranges because at the present time the distance between the top of the gas burner and the top of the grid is approximately two inches. With a four ounce pressure you can use the gas with comparative efficiency in a range constructed in that way but with a two ounce pressure I think it is going to be necessary to bring the cooking surface of the range closer to the burner and with gas ranges constructed as they are at the present time that cannot be done.

CHARLES V. CRITCHFIELD: Oh, that is not a debatable question at all. The manufacturer of natural gas appliances must arrange to build and construct his appliances so as to meet this difficulty since the cooking surface must be brought closer to the flame. I used to burn artificial gas. In fact I used to manufacture artificial gas and later on began the use of natural gas. My wife always said to me she thought she could get quicker results on the old artificial range than she could get on the new natural gas range and this has been brought home to me for a good many years. The fact is that the burner in the natural gas range has been too far away from the top surface of the range. It might do in years gone by when we had all kinds of natural gas supply but when we are getting down to the point where we are conserving the gas and using a lower pressure it is of course necessary that the appliance manufacturer should adjust himself to these changed conditions in the construction of his natural gas appliances.

J. C. McDOWELL: From a practical point of view I think this paper of Mr. Critchfield's is one of the most valuable we have ever had presented to our Association for the reason that there is a very general impression among the consumers of gas that they are not getting half of the heat units out of the gas or half out of the gas when they receive it at a lower pressure that they do at a higher pressure. This impression is so strongly imbedded in the public mind and it is so important that the true situation be brought to their attention that I do not think a gas company could do a wiser thing than to have this paper printed in the form in which it is now prepared for this convention and distributed among their consumers. It would do a world of good.

Information is what the people want. They have been misinformed by demagogues because of their own naturally antagonistic feeling towards the gas meter and towards the gas man and they feel that they are being cheated in this way by the Gas Company. In fact many Cities have raised this question and some Public Utilities Commissions have also labored under a similar misapprehension; one I know of particularly, attempted to enforce a higher pressure on the ground that there is not enough heat in the low pressure gas. So for that reason I am very much pleased to hear this paper and to have it presented to the members of this Association at this time.

Just one further suggestion on the matter of pressure. I will only take a moment. I know of two large installations which were installed and designed to distribute gas at a two ounce pressure and they gave a very fair service at that pressure. So that it is a question of design of your plant which is the practical point that must be given due consideration.

L. B. DENNING: In line with Mr. Critchfield's statement that he thought that an artificial gas installation would give better results I may state that some experiments have recently been conducted—a series of them in fact, by the Ohio State University seeking to obtain comparative results by the use of an artificial gas stove taken out of stock and the ordinary natural gas range and hot plate. The experiments show that much better results were obtained from the use of the artificial gas stove than by either the natural gas range or the hot plate. I am informed that it is perfectly fair to conclude from the results of those experiments that anything above two ounces pressure in the use of natural gas is a waste both to the consumer and to the Company.

Before this discussion is ended I would like Mr. Wyer to give the results of those experiments for the benefit of the members of the Association.

SAMUEL S. WYER: Some time ago in order to answer the question as to what is usable natural gas pressure, arrangements were made with the Department of Home Economics at the Ohio State University, Columbus, Ohio, to run a series of tests making determination as to exactly what the gas consumed would be and what the time element would be and what the general efficiency of the apparatus would be in cooking potatoes by ordinary pan frying and boiling; in cooking meat by ordinary pan frying and pan broiling and in baking bread.

The first thing that was done was to follow the general viewpoint that usable conditions were more important

than were efficiency. Therefore, a series of tests were conducted with the idea of translating—if we may use the expression—all of the engineering features into domestic science or home economics, in cooking operations. These tests have been completed. They have been published by the Ohio State University as a University Bulletin. Additional copies of that Bulletin can be obtained directly from the Department of Home Economics of the University.

The Bulletin is twenty-seven pages long and gives all the details of the tests which were carried on in demonstrating cooking operations from two-tenths of one ounce up to five ounce pressure using a standard natural gas range, a standard manufactured gas range and a standard hot plate with no change whatever in adjustment.

In addition to giving the data pertaining to the test there is a general discussion of the fundamental principles underlying the whole natural gas pressure situation. In order that you may get a summary of the tests I will read the conclusion.

"1.—Satisfactory cooking operations in frying potatoes, boiling potatoes, frying beefsteak, and pan broiling beefsteak can be carried on with .2 oz. natural gas pressure.

"2.—The changes in vessel position necessary to permit satisfactory operation at pressures as low as .2 oz. are easy to make and require no special changes in existing stoves.

3.—Bread can be satisfactorily baked with .5 oz. natural gas pressure.

4.—Natural gas stoves are not properly constructed to use natural gas efficiently at high pressures, nor satisfactorily at low pressures.

5.—At high pressures natural gas stoves are inefficient and therefore wasteful in their use of gas.

6.—The burners on natural gas stoves are too low.

7.—The holes in the spuds of natural gas stoves are too small.

8.—Long flames for cooking operations are wasteful.

9.—The maximum results are obtained with many short flames rather than a few long flames.

10.—A strong draft of air may deflect the flame away from cooking vessel so as to seriously interfere with and in many cases stop cooking.

11.—Where two flames strike each other, due to the fact that openings are too close in burner, poor combustion will result. This will produce a luminous flame which will in turn result in a smoking burner. Neither air nor gas adjustment can overcome this.

12.—Drilled burners are better than slotted burners, because there is less likelihood of two adjacent flames striking against each other, therefore producing imperfect combustion conditions.

13.—Natural gas cook stoves should not be furnished with solid stove tops since this suggests the carrying on of cooking operations on top of the stove, rather than with the vessel in the proper position.

14.—At low pressures no perceptible change can be made in the combustion by adjusting the air shutter. The best conditions obtained were with the shutter wide open.

15.—Too much heat is used in most cooking operations, correct application is more important than mere intensity.

16.—The natural gas pressures carried in most natural gas distributing plants are too high for efficient operation.

17.—Meter registration is approximately correct regardless as to variation in pressure. That is, meters do not run faster when the pressure is low.

18.—Lowering the temperature of natural gas increases its heating value per cubic foot. Natural gas has a temperature about 25 degrees lower in the coldest month in winter than in the hottest month in summer, and the heating value per cubic foot due to change in temperature is therefore about 5 per cent higher in the coldest month in winter than in the warmest month in summer.

19.—The maximum possible variation of heating value due to variation in gage pressure would make the heating value during the low pressure periods in winter less than 3 per cent lower than during the high pressure period in summer.

20.—Since the heating value increase due to low temperature of gas in winter more than offsets the possible decrease in heating value due to low pressure, the practical effect of the two is that the heating value per cubic foot of natural gas as served in the winter under low pressures and low temperature is higher than that served in the summer under higher pressures and higher temperature.

21.—Variation in barometer from day to day may make more of a change in the heating value of gas than any possible variation in gage pressure.

22.—Better and more efficient service could be rendered if natural gas pressures were generally lowered to probably 2 oz. rather than increased to 4 oz. or above.

23.—The lowering of natural gas distributing pressures to approximately 2 oz. would produce more efficient and satisfactory operating conditions for the consumer, would greatly curtail the leakage on the consumer's premises, which is paid for by the consumer, and would also substantially lower the leakage in the gas company's distributing plant."

DONALD McDONALD: I differ fundamentally with the conclusions arrived at by Mr. Critchfield as to any benefit being derived by lowering our pressure. The largest part of our investment is in our distributing mains. If you divide the distributing pressure by four you cut down the quantity of gas, so that makes you carry about one-half. If you adjust your appliances to one inch and you only get a half inch then there is going to be dissatisfaction.

If everybody in your City is adjusted down to one inch and all of them together take more gas than you can

Things true and evident must of necessity be recognized by those who would contradict them.—Epictetus.

your pressure is going to fall and nobody will
er satisfied than he is now

ht not start out by telling the public that it
y to lower our pressure, because if it is our
ver our pressure it is also our duty to double
l our distributing mains That is a serious
lessen and you are not accomplishing anything
have done it.

ist a house so that it can be heated with a half-
sure just as Mr Cartwright did, then if every
that I cannot hold the half ounce pressure
that half ounce pressure all the customers
e taking more gas than the Company can fur
at pressure and to remedy the difficulty we
imposing on ourselves the duty of investing
millions in mains when our customers will be
than before unless we can furnish them with
l of gas they need

lomer has been used to putting three lumps of
cup of coffee But suppose he cannot get but
He does not say the sugar is not as sweet
efore But he knows he has not got enough
is exactly the same way with gas If he is
l to getting a hundred feet an hour and he can
feet an hour he don't get enough He cannot
hing He is not warm Some of them are
ugh to say that the gas is not as hot as it was
we are paying for it we want that much more

ve meet these unfavorable conditions by encouraging
mentally much more than by reducing the pres
at lower pressure We must have the co-operation
ur people to enable us to furnish them with gas

MR CARTWRIGHT I cannot agree
I McDonald in his contention that we by our
will decrease the consumption I agree
more that it is our duty to reduce the pressure
same It is entirely possible to install re
ulators at home and to use the gas that we
at a lower pressure The trouble with our
system at present is that we have a more
as it is in the most remote parts of which I

ederick this last winter I used gas at one half
pressure, we shall in all probability use half
would hardly know what it would amount to
next door to me has a house about the same
temperatures for the two days were not the
rees The man next door never had over 45
his house during that time yet his gas bill was
as it what mine was He used the same
gas but he did not get the proper efficiency

advocating the installation of individual reg
rs I would indicate we have one section where there
many individual regulators and where we use
ore than the gas at 4 and 6 ounces pressure
s to be at all times that section of the city
e when the gas gives out it does not make
ence what installation we have for a long
as there is any gas there that section of the City gets along very well during these extreme periods But in sections of the City where we attempted to cut it down below 4 ounces they were almost as bad off as if they had no gas at all I do not believe we are facing the impossible problem of a reduction in this pressure I believe it can be worked out But each company by itself must consider its own individual problem Something must be done as Mr Critchfield has said to teach the consumer to properly utilize the gas which we are able to furnish to him Of course there is not going to be enough to go around then but we are going to get a good deal further with your problem than we will under the present situation

MR WEYMOUTH There is one point indicated in Mr Critchfield's paper which was not emphasized and which I would like to call attention to at this time, it shows the results of certain tests that were made The results of the tests were given but the efficiency is not stated I have thoroughly worked out some figures while listening to the reading of the paper which indicate that the efficiency at 4 ounces in the first table is approximately 90 per cent and with 4 ounces it is approximately 75 per cent

In the second table the efficiency at 4 ounces is approximately 87 per cent and at 4 ounces it is 74 per cent In other words as I have figured it at 4 ounces the low pressure the efficiency is 4 per cent greater than at 4 ounces and at 4 ounces it was 13 per cent greater

We have had a good deal of discussion on the question of the gas man's profit on the sale of gas per thousand feet and I would like to call attention to the fact that the gas at 4 ounces pressure is worth more to the consumer than the gas at 4 ounces pressure and at the same price

In one of the cities in which I gave an address on the subject of gas the gas man's profit was based on the number of thousand feet sold and the consumer was charged 4 cents per thousand feet for gas at 4 ounces pressure and 4 cents per thousand feet for gas at 4 ounces pressure The consumer was given the choice of gas at either pressure and he could have gas at the 4 ounce pressure at the same price as he paid for the 4 ounce gas

I would also like to call attention to the phase of the question that has come up in the statement made by Mr McDonald and Mr Cartwright We have to bear in mind that at the lower pressure less gas will be burned through the present burning system nevertheless with the greater efficiency of operation that could be effected by a proper education of the public and by adjusting and changing these appliances there would be less gas demanded for the same needs

As Mr Weymouth has pointed out the efficiency does not

Patience and time do more than strength and passion.—Racine

only about 13 per cent with 4 ounce pressure and I imagine from 13 to 18 per cent would represent fairly well the average efficiency obtained under these conditions, whereas it is shown by Mr. Wyer's test and Mr. Critchfield's tests and tests of my own, that efficiency of 37 to 45 per cent is very easily obtained, practically and in every day service. That means that we have practically one-third of the gas consumption or from 13 to 39 per cent for the same service. So that you would need less gas through your distributing system and even assuming that an increase of consumers creates a greater demand for your gas changes such as Mr. Cartwright has outlined could very readily be made to the distributing system or possibly changes in the low pressure regulator systems and increasing the number of them. I think that could be worked out very satisfactorily and without very great expense.

J. H. MAXON: There are two points in this discussion that I think ought to be fully emphasized; one raised by Mr. McDonald, that it is obvious that we cannot reduce the delivering capacity of our low pressure systems and maintain the delivery of the quantity of gas that is needed. No company practically can stand the additional investment to attempt any such experiments.

The other point is that it may be entirely practical to standardize the pressure on the customer's premises, which probably is desirable, so that regardless of the pressure on the distributing mains there may be a continuous certain pressure on the piping of the particular building. That has been followed successfully in many instances. In some instances by appliance manufacturers installing on the equipment a regulator that was adjusted so that the boilers—I refer to heating boilers,—worked always on a low pressure. That has furnished very satisfactory results as to efficiency.

It is practical to install a sensitive regulator on the service of customers and by the particular sized piping in the building utilize gas more advantageously at lower pressures than it is now utilized. The customer, however, should be the one who bears the burden of the investment in the regulator, the enlarged pipe and the necessary appliances to get the full advantage out of the gas rather than the Gas Company.

JOHN A. MILLER: I think Mr. Cartwright and Mr. McDonald are both right. They appeared to differ with each other but I think they really agree on the main point. The main issue in this whole controversy I think can be settled by having uniform pressure whether it be one ounce, two ounces or one-half inch water, having uniform pressure at each house throughout the twenty-four hours and then have your appliance adjusted to that pressure. I think that will solve the difficulty. If the main system is not in such condition that the pressure can be maintained then you should install a regulator. I have always contended that natural gas ranges are very inefficient from the appliance standpoint and they certainly should be changed as rapidly as possible in order to make them efficient.

In regard to the question of pressure it does not matter what your pressure in different parts of the town is, so long as it is maintained at the same point throughout the twenty-four hours in the various districts of the town. I think that would settle the whole controversy.

MR. CRITCHFIELD: Just as a matter of information on the question of introducing individual regulators, we have in Ohio a Gas Company that is unique. It is an artificial gas company distributing gas under high pressure. As I recall it there are about ten towns furnished by this company three of which are county seats They distribute artificial gas through their small mains, —2 and 3 inch mains under a pressure of 8 to 10 pounds and every single consumer is served through an individual regulator. This company has been in operation some three or four years and the distribution of their product has been entirely successful.

J. C. McDOWELL: I suppose there are 60,000 individual regulators in this City.

DONALD McDONALD: I don't want to be a brake on the wheels of progress but I am also dead set against house regulators and I will tell you why. First of all, we don't need them. In the second place the consumers pipes are generally speaking not large enough to distribute through his own house at a low pressure. The place to regulate gas is at the key of the appliance in which you are burning it. Any burner will do proportionately better under one inch pressure. The stove in any city will work better under one inch pressure than under higher pressure up to that appliance. If the consumer gets better results at one inch pressure than he does at four inch—as most of them would why can't he turn that little cock just a little bit and put the flame down to where he wants it? As a matter of fact that is what he does. We get no complaints from too much pressure. If we turn the pressure down in our mains and the consumers open their stop cocks wide then if the pressure goes up in the main, the blaze would whistle and there would be complaints all over town. But what actually happens is that each consumer turns down his heating stove and his furnace to that point that satisfies his individual needs and to have automatic appliances on his house will furnish uniform pressure in the cellar and probably give a fairly good result at the cooking stove but would give no gas at all in the third story. will not satisfy the needs of the individual consumer. It imposes a large investment on our consumer, and I will tell you another thing; all of these automatic regulators are equipped with rubber diaphrams and in time they will get stiff and lose their elasticity and ultimately break and in due course of time you will get the complaint that somebody's house is about to be blown up.

As I said before I don't want to stand in the way of progress but it seems to me that if you want your customers to use your gas at low pressure then let the individual customer regulate it himself at the key of the appliance in which he is burning it.

L. B. DENNING: I am afraid that Mr. McDonald has not been up against the point which he suggests. I have. I want to say if the obligation is fastened on the Gas Company to furnish adequate pressure at the consumer's burner it is going to bankrupt every Gas Com-

A DOUBLE BURNER

MAKE YOUR LETTERS SAY WE LL WIN

PREVENTING GAS FIRES NEAR OIL AND GAS PLANTS

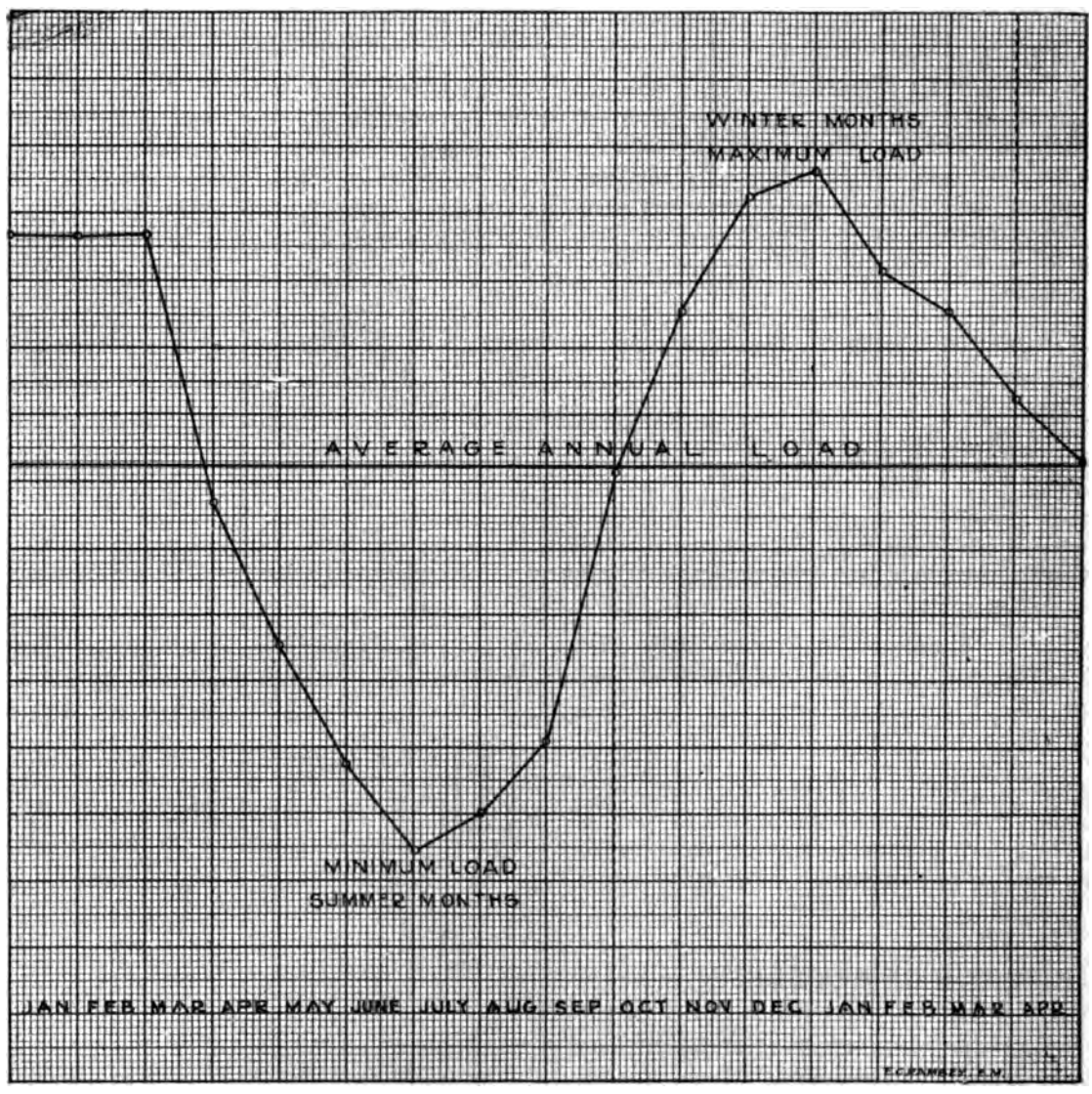
ELECTION OF OFFICERS

Toil is the law of life and its best fruit Morris

A MORE UNIFORM DELIVERY.

WHEN one's eye follows the line described on this diagram loaned by the Ohio Fuel Supply Company of Columbus, it is not surprising that at times the natural-gas-man might be accused of having an attack of old-time ague, on account of his "shaking in his boots."

The curve indicates the amount of gas sold by the Ohio Fuel Supply Company during various months of the year. On the line between December and January appears the peak or maximum load.



At such "peak" times, the public claims "gas shortage," while the gas-man describes the condition as "delivery *then* of more gas than at any other time in the year."

It is being urged that gas companies should find means whereby to make the delivery more uniform throughout the year. We believe utilities commissions and executive bodies are gradually coming to the point of agreeing that such would not only be fair to the company, but would render best service to the public.

It certainly is not fair to ask the gas company to go to enormous expense, in order to take care of those comparatively few people who use no more than a mere trifle of the company's product during the year until the severe cold is upon them, *and then make requisition for large volume*.

Every gas company should do all it can to supply communities, and we believe the great majority of companies make a strong effort in that direction. However, no company has accomplished the impossible, nor can companies do so, nor can they afford to invest large sums in means for supplying *excessive demand for but an exceedingly brief period with such investment to remain idle the balance of the year.*

Unless the public is willing to do its part by paying per thousand cubic feet *throughout the year* in order that the gas company may have in hand funds with which to prepare itself to meet the public's unusual peak load demands, we do not see how such can be met.

We insure ourselves and our property by paying a premium. Our property does not burn; we are not injured through accident; we do not have an automobile collision, and therefore the premiums we pay per

So much is a man worth as he esteems himself.—Rabelais.

THE GERMANY THAT IS TO BE

HOW ADVERTISING SAVES YOU MONEY

There are some defects more than skin deep. Montagne

RESULTS OF DRILLING---LATEST REPORTS

PENNSYLVANIA FIELD.

ALLEGANY FIELD.

Wheeler hrs., A. L. Shaner & Co.	Gas
Fee, A. P. McDivett	Dry

MIDDLE FIELD.

Mickelson, Burton & Co. 1	Gas
Grandin, Sand Hill Oil 6	Gas
Johnson, Triumph Oil 23	Gas
McKean, Haskell & Co. 19	Gas
McKean, Haskell & Co. 20	Gas
Deible Oil, Gaston & Lander 114	Gas
Siggins, G. B. Siggins 13	Gas
Siggins, G. B. Siggins 14	Gas
Natural Gasoline, Shanley 21	Dry
Lot 373, Penna. Oil 671	Gas

Dry	1
Gas Wells	9

BRADFORD FIELD.

Q. Irons est., Stoner & Gaffney 12	Dry

VENANGO-CLARION.

Culp, United Natural Gas 2	Gas
Lusher, Bullard, Dalley et al. 8	Dry
Sullinger, Grieff & Smith 5	Dry
Clarion County—	
Hanby, Shorts & Master 2	Dry
Weaver, G. A. Weaver 3	Dry
Yonkers, J. Black	Dry
Brisben Bros., W. F. Smitz 1	Gas
Furnace, Furnace Co. 3	Gas
Forest County—	
Coleman tract, Jefferson Co. Gas	Gas

Dry	5
Gas Wells	4

BUTLER-ARMSTRONG.

S. Glenn, McCandless & Co. 5	Dry
Douthett heirs, Wall, Hall et al. 2	Dry
J. S. Campbell, W. B. Rath 3	Dry
Adam Lang, Lang & Co. 1	Gas
Mrs. P. Hockenberry, T. S. Armstrong 2	Dry
Steeb, Youngbloot & Goettman 1	Dry

Dry	5
Gas	1

SOUTHWEST PENNSYLVANIA.

Washington—	
Buckingham, Mfrs. L. & H. 1	Gas
Henry, Geary Oil 1	Dry
Imperial—	
Briceland hrs., Watson & Co. 3	Dry
Dorseyville—	
Trautman, Mer. N. G. 1	Gas
Braun, Mer. N. G. 1	Dry
Nuttall hrs., Alex Walley 1	Dry
Ingomar—	
Rhine-Timmons, Walker & Co. 1	Dry
Duff City—	
Kirk-Christy, E. A. Bream 11	Dry
Bellevue—	
Gibson hrs., M. M. Walley & Co. 3	Dry
Beaver County—	
Brown & Co., Lynn & Co. 1	Dry
Milltown—	
McMath hrs., Peoples Gas 1	Dry
Morrison, National Oil & Gas 1	Gas
McMath, Clark & Vincent 1	Dry
Mt. Morris—	
Keener, J. L., Garard 9	Dry
Thomas lot, J. L. Garard & Co. 4	Dry
Stewart hrs., Peoples Gas 1	Gas
Calvert, Peoples Gas 1	Gas
Thomas, Philadelphia Co. 1	Gas
Graham, Natural Gas of W. Va. 3	Gas
Wendt, Carnegie Gas 2	Gas
Cooper, Mfrs. L. & H. 2	Gas
Flaherty, Peoples Gas 1	Dry
Estell, Philadelphia Co. 1	Gas

Dry	13
Gas	10

WEST VIRGINIA.

Mannington—	
Neeley, Reserve Gas 1	Gas
Gump, South Penn Oil 4	Gas
Copenhaver, Carnegie Gas 1	Gas
Baker, Blackshere Oil & Gas 2	Gas
Straight, Blackshere O. & G. 4	Gas
Tennant, Philadelphia Co. 1	Gas
Price, Hope Gas 1	Gas
Durkin, Hope Gas 1	Gas
Coffman, Hope Gas 1	Gas
Fox, Carnegie Gas 1	Gas
Musgrave, Hope Gas 1	Gas
Beaty, Southern Oil 3	Gas
McReynolds, Phila. Co. 2	Gas
Lemley, Carnegie Gas 1	Gas
Hixenbaugh, Cochran & Funk 8	Dry
Rice, Mfrs. L. & H. 2	Gas
Nichols, Mfrs. L. & H. 1	Gas
Tuttle, Hope Gas 1	Gas
Lemasters, M. V. T. 3	Gas
Wetzel and Tyler—	
Welling, Mfrs. L. & H. 1	Dry
Marshall County Bk., Mfrs. L. & H. 6	Dry
Eastman, Hope Gas 1	Gas
Cook, Benedum-Trees Oil 1	Dry
Myers, Domain Oil 3	Dry
Marshall County—	
Charnock, Mfrs. L. & H. 1	Gas
Blake, Mfrs. L. & H. 1	Gas
Earnest, Mfrs. L. & H. 1	Gas
Hancock County—	
Bucher hrs., Resolute Oil 9	Dry
Mahan, Mahan Oil 1	Dry
Wood County—	
Cover, Carter Oil 2	Gas
Ritchie County—	
Haught, South Penn Oil 25	Dry
Trainer, R. G. Gillespie 2	Dry
Ellison, Hope Gas 1	Gas
Jones, Hope Gas 1	Gas
Elliott, Carnegie Gas 1	Gas
Smith, Eastern Petroleum 1	Gas
Wirt County—	
Adams, Kreps & Co. 1	Dry
Pleasants County—	
Nesuseschwander, Coal River Oil 7	Dry
Pethtel, S. Y. Ramage 46	Dry
Calhoun County—	
Bell, G. L. Cabot 1	Gas
Williams, G. L. Cabot 1	Gas
Roane County—	
McCloy, United Fuel Gas 1	Dry
Whited, Fisher Oil 2	Dry
Hart, G. L. Cabot 1	Gas

Truth has never been, never can be, contained in any one creed or system.—Ward.

Kanawha County—
Ward tract, Cabin Creek Gas 19 ..... Gas
Thompson, Eastern Carbon 6 ..... Dry
Wherley, Montgomery Oil & Gas 1 ..... Gas
R. C. C., Ohio Cities Gas 1 ..... Dry

Dry 16
Gas 32

SOUTHEASTERN OHIO.

Woodsfield—
Boltz, Hardy & Co. 2 ..... Gas
Perry County—
Schmeltzer, Carter Oil 1 ..... Gas
Elder, Stewart & Co. 1 ..... Dry
Licking County—
Loughman, Ohio Cities Gas 1 ..... Dry
Fairfield County—
Stoner, Rise, Rush & Co. 1 ..... Dry
Muskingum County—
Deitrick, Southern Oil 1 ..... Dry
Nice, Citizens N. Bank 4 ..... Dry
Brison, Wilmington-Athens Oil 12 ..... Dry
Morgan County—
Augustein, Frank Panhans 1 ..... Dry
Noble County—
Saling, C. E. Hammons & Co. 24..... Dry
Hanna hrs., Kerr Bros. & Co. 5..... Dry
Marietta—
Taylor, Percy Davis 3 ..... Dry
McWherley, Sutton Bros. 1 ..... Dry
Beardmore, Penna. & Ky. Oil 2 ..... Dry
Brown Bros., Immel & Co. 4 ..... Dry
Soles, Beaver Falls Dev. 1 ..... Dry
Edwards, S. E. Edwards & Co. 1 ..... Gas
Lowry, Earl Stephens 1 ..... Dry
Francisco, Fleming & Hicker 2 ..... Dry
Rardin, Kamerer & Co. 6 ..... Dry
Hall hrs., Exchange National Bank 31..... Gas
Westbrook, G. L. Watson & Co. 2..... Dry
Carroll County—
McClave, Natural Gas of W. Va. 1..... Gas
Harrison County—
Lattimer, W. C. Kennedy 1 ..... Dry
Cippakizer, W. C. Kennedy 1 ..... Dry
Borland, H. B. Cameron & Co. 1 ..... Dry
Rife, Hodges & Co. 3 ..... Dry
Jefferson County—
Scott, Steuben Oil & Gas 4 ..... Dry
Belmont County—
Stoneking, Natural Gas of W. Va. 1 ..... Gas
Crozier hrs., Natural Gas of W. Va. 1 ..... Gas

Dry 23
Gas 7

PENNSYLVANIA FIELDS.

SUMMARY OF COMPLETED WELLS.

	Comp.	Prod.	Dry	Gas
Allegany	14	20	1	1
Bradford	52	104	1	0
Middle Field	29	29	1	9
Venango-Clarion	56	66	5	4
Butler-Armstrong	14	25	5	1
So. W. Pa.	50	173	13	10
West Virginia	117	884	16	32
S. E. Ohio	119	802	23	7
Total	451	2,103	65	64

CENTRAL OHIO.

FAIRFIELD COUNTY.
Berne—Wm. Curile, City Nat. Gas 1..... Dry

KNOX COUNTY.
Pike—J. H. Metzger, Upham Gas 1 ..... Dry
Brown—J. J. Neyhart, East Ohio Gas 1 ..... Gas

ASHLAND COUNTY.
Lake—M. M. Byers, Logan G. & Fuel 1 ..... Dry
Perry—Alex. Griffith, Logan G. & F. 1..... Dry
Hanover—J. M. Hay, Logan Gas & Fuel 1..... Dry
Moerz, Ohio Fuel Supply 1 ..... Gas
A. & J. Strickler, Ohio Fuel Supply 2 ..... Gas

Dry 3
Gas 2

MEDINA COUNTY.
Westfield—Clyde Steele, Ohio Fuel Sup. 1 ..... Gas
J. W. Strock, Ohio Fuel Supply 1 ..... Dry
Medina—J. Kennedy, Medina Gas & F. 1..... Gas
J. A. Witzel, Ohio Fuel Supply 1 ..... Gas
I. H. Kennedy, Logan Gas & Fuel 1 ..... Dry
Lafayette—J. Mong, Ohio Fuel Supply 1 ..... Gas
M. F. Dague, Ohio Fuel Supply 1..... Gas
P. J. Warner, Ohio Fuel Supply 2 ..... Gas
M. J. Young, Kundtz & Hulse 1 ..... Gas
I. J. Snyder, Medina Gas & Fuel 2 ..... Gas

Dry 2
Gas 8

LORAIN COUNTY.
Grafton—M. H. Wilkins, Ohio F. Supply 1..... Dry

WAYNE COUNTY.
Cannan—J. & E. Fetzer, Logan G. & F. 1 ..... Gas
C. & K. Stebbins, Logan Gas & Fuel 1 ..... Dry
T. Brinkerhoff, Brinkerhoff & Co. 2 ..... Gas
Maggie McElroy, Ohio Fuel Supply 1 ..... Gas
T. A. Armstrong, Preston Oil 1 ..... Dry
Wayne—D. Mowery, Ohio Fuel Supply 1 ..... Dry
D. W. Mowery, Ohio Fuel Supply 1 ..... Dry
Jos. W. McDonald, Vanover & Co. 1 ..... Gas
Milton—L. & C. Steiner, East Ohio Gas 1 ..... Gas
Clinton—F. L. Denney, East Ohio Gas 1 ..... Dry
Geo. Iceman, East Ohio Gas 1 ..... Dry
E. I. Craig, East Ohio Gas 3 ..... Dry
G. F. Aylesworth, East Ohio Gas 2 ..... Gas
H. B. Brown, Medina Gas & Fuel 1 ..... Gas
Plain—G. Z. Cochel, Ohio Fuel Supply 1 ..... Dry

Dry 8
Gas 7

RICHLAND COUNTY.
Monroe—W. & M. Wigton, Logan G. & F. 1 ..... Dry

CUYAHOGA COUNTY.
Dover—A. A. Ellenwood, Preston Oil 1 ..... Dry
Chas. Bailey, Preston Oil 1 ..... Gas
J. May, J. May 1 ..... Gas
B. L. Smith, East Ohio Gas 1 ..... Gas
J. E. Elsholtz, East Ohio Gas 1 ..... Gas
W. Juergmier, East Ohio Gas 1 ..... Dry
A. S. Cooley, East Ohio Gas 1 ..... Dry

Dry 3
Gas 4

VINTON COUNTY.
Richland—C. R. Poling, Ohio Fuel Supply 2 ..... Gas
C. R. Poling, Ohio Fuel Supply 6 ..... Dry
C. R. Poling, Ohio Fuel Supply 8, 9..... Gas
John Scott, Ohio Fuel Supply 2 ..... Gas
Wm. Petty, Ohio Fuel Supply 1 ..... Gas
Lewis Kruger, Ohio Fuel Supply 2 ..... Gas

The difficulty in life is the choice.--Moore.

J. A. Barney, Ohio Fuel Supply 1 ..... Gas
Eagle—Lydia Shoemaker, Ohio Fuel S. 1..... Dry

Dry 2
Gas 7

PERRY COUNTY.

Thorn—J. W. Conn, Ohio Fuel Supply 1 ..... Gas
C. A. Hettrick, Ohio Fuel Supply 1 ..... Gas
B. Alspaugh, Logan Gas & Fuel 2 ..... Gas
D. Boring, Columbus Natural Gas 1 ..... Gas
J. Yost, Columbus Natural Gas 1 ..... Dry
I. A. Trovinger, Heisey Gas 1 ..... Gas
E. M. Yost, Heisey Gas 1 ..... Gas

Dry 1
Gas 6

HOCKING COUNTY.

Salt Creek—D. Schwalbaugh, Logan Gas & Fuel 2.. Gas
W. A. Williamson, Ohio Fuel Supply 2..... Gas
Benton—S. C. Harsh, Ohio Fuel Supply 1 ..... Gas

Gas 3

HOLMES COUNTY.

Ripley—C. A. Craig, Medina G. & F. 1..... Dry
Washington—P. Sprang, Logan G. & F. 2..... Dry

Dry 2

JACKSON COUNTY.

Franklin—W. C. Mercer, Ohio Fuel Sup. 1..... Dry

CENTRAL OHIO.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry	Gas
Fairfield	1	0	0	1
Knox	2	0	1	1
Ashland	5	0	3	2
Medina	10	0	2	8
Lorain	1	0	1	0
Wayne	18	200	8	7
Richland	1	0	1	0
Cuyahoga	7	0	3	4
Vinton	10	2	2	7
Perry	7	0	1	6
Hocking	3	0	0	3
Holmes	2	0	2	0
Coshocton	0	0	0	0
Jackson	1	0	1	0
Total	68	202	25	39

LIMA FIELD.

WOOD COUNTY.

Bloom—P. Ziegler, Geo. Lefler 1 ..... Gas

HANCOCK COUNTY.

Marion—Town lot, City of Findlay 2..... Gas

SENECA COUNTY.

Clinton—A. G. Stoltz, A. G. Stoltz & Co. 1..... Dry

OTTAWA COUNTY.

Allen—A. H. Sandrock, John Weber 1..... Gas

INDIANA FIELD.

JAY COUNTY.

Penn—S. E. Davis, Jones & Lyons 9 ..... Dry
P. J. Kirkman, Chandler & Cooper 1..... Dry

Dry 2

GRANT COUNTY.

Van Buren—B. Studebaker, Producers Refiners of Indiana 1 ..... Dry

HUNTINGTON COUNTY.

Salamonie—R. Rausch, March Pet. Oil 1 ..... Dry

DELAWARE COUNTY.

Liberty—S. R. Strong, Powers, Nat. Oil 2 ..... Dry

RANDOLPH COUNTY.

Monroe—Martha Adams, Black Diamond Oil 4..... Dry

GIBSON COUNTY.

Washington—Roberts, Indian Refg. 1 ..... Dry
W. S. Hegeman, Indian Refg. 1..... Dry

Dry 2

PIKE COUNTY.

Madison—S. A. D. Barker, A. B. Bement 3..... Dry

SULLIVAN COUNTY.

Turman—A. T. Osborne, A. T. Osborne 6 ..... Dry
Gill—W. E. Maple, Wilson & Co. 1..... Gas
J. J. Bragdon, Indiana-Illinois Oil 7..... Dry
T. Durham, Indiana-Illinois Oil 1..... Dry
Luke Squires, Lumbarr O. & G. 1..... Dry

Dry 4
Gas 1

INDIANA FIELD.

SUMMARY OF COMPLETED WORK.

	June, '18. Comp.	Prod.	Dry	May, '18. Comp.	Prod.	Dry
Jay	2	0	2	1	0	1
Grant	1	0	1	0	0	0
Huntington	2	5	1	3	9	0
Delaware	4	8	1	2	0	2
Randolph	8	19	1	1	25	0
Gibson	7	67	2	0	0	0
Pike	7	365	1	8	266	4
Sullivan	5	0	5	3	0	3
Allen	0	0	0	1	4	0
Total	36	464	14	19	304	10

KENTUCKY-TENNESSEE.

WAYNE COUNTY.

Parmleysville—J. Keeton, Wood Oil 20..... Dry
Union Precinct—B. L. Ramsey, Bradford Nat. G. & O. 1 ..... Dry
A. B. Horton, Bradford Nat. G. & O. 1..... Gas

Dry 2
Gas 1

WOLFE COUNTY.

Torrent—W. B. Bush, Cameron Oil 1..... Dry
M. Davis, Meadon Creek O. & G. 1..... Dry
G. W. Spencer, G. W. Menzie, Rec. 2..... Dry

Dry 3

MORGAN COUNTY.

Cannel City—Little, Mullen & Co. 4..... Gas
Clay Murphy, Mullen & Mellen 1..... Dry

Dry 1
Gas 1

ESTILL COUNTY.

Irvine—Ike Neal, Wood Oil 2 ..... Dry
H. T. Williams, Brodie, Reis & Holden 1..... Dry
N. D. Wireman, Arco Oil 18..... Dry
T. E. Wise, Moss & Co. 3..... Dry

The universe is change; our life is what our thoughts make it.—Aurelius.

POWELL COUNTY

LEE COUNTY

WARREN COUNTY

BARREN COUNTY

ELLIOTT COUNTY

PULASKI COUNTY

OWSLEY COUNTY

SIMPSON COUNTY

KENTUCKY TENNESSEE

ILLINOIS FIELD

CLARK COUNTY

CRAWFORD COUNTY

WASHINGTON COUNTY

COLES COUNTY

KANSAS

BUTLER COUNTY

Fortune is unstable, while our will is free Lucretius

27-34-10, Rathburn, Denman Bros. 2 ..... Dry
13-34- 9, McMann Oil 1 ..... Dry
11-34-11, Brown, C. D. Armstrong 1 ..... Dry

Dry 13
Gas Wells 7
Gas Production 10,000,000

MIAMI, FRANKLIN, DOUGLAS COUNTIES.

10-16-21, Batdorf, Flo Jean O. & G. 5 ..... Dry
27-16-21, Graves, Galey & Richard 1 ..... Dry
31-16-21, Definbaugh, Peerless O. & G. 14 ..... Dry
17-17-23, Kepple, Mid-West Pet. 4 ..... Dry
36-16-21, Downs, H. E. Hirsch 1 ..... Dry
17-16-21, Barnett, Elm Tree Oil & Gas 4 ..... Dry
35-15-21, Pool, Valentine et al. 2 ..... Dry
16-17-23, Wilsy, Belle Oil & Gas 1 ..... Dry
21-17-22, Day, Davidor et al. 2 ..... Dry
8-17-22, Kepple, Owner not named 2 ..... Dry
21-17-22, Liggett, Dr. I. N. Miller 1 ..... Dry
4-17-22, Fry & Wells, Root, Penman & Co. ..... Dry
17-17-23, Bosworth, W. E. Maxon, Jr., 6 ..... Dry
19-17-23, Young, Root, Penman & Co. 22 ..... Dry
18-16-21, Todd, Minn.-Wyo. Pet. 1 ..... Dry
28-16-21, McLain, Wellsville Citizens 1 ..... Dry
17-16-21, Barnett, Elm Tree O. & G. 5 ..... Gas
32-16-21, Smith, Peerless Oil & Gas 4 ..... Dry
18-16-21, Todd, S. S. Todd 2 ..... Dry

Dry 18
Gas Wells 1
Gas Production 500,000

ALLEN COUNTY.

1-26-18, Bringer, Miller Oil & Gas 1 ..... Dry
10-26-19, Osborn, L. K. Spielman 6 ..... Dry
10-26-19, Osborne, L. K. Spielman et al. 5 ..... Dry
2-26-18, Flourney, Landen & Stacey 4 ..... Dry
16-26-18, Squire, T. M. Galey 9 ..... Dry

Dry 5

NEOSHO COUNTY.

12-28-18, Williams, Devore & Cady 2 ..... Gas
36-27-17, Johnson, W. M. Wells 8 ..... Dry
35-28-18, Yockey, Spielman et al. 13 ..... Dry
12-28-18, Williams, Frank Devore et al. 3 ..... Dry
9-28-18, Dickerson, J. B. Murphy 1 ..... Dry
1-28-18, Burghart, Liberty O. & G. 4 ..... Dry
1-28-18, Burghart, Liberty O. & G. 5 ..... Dry
6-28-19, Jackson, Filson & Moore 12 ..... Dry
29-28-18, McNary, Rue & Delove 1 ..... Dry
33-26-16, McCloud, Young Bros. 2 ..... Dry
7-28-19, Colaw, L. L. Covin 1 ..... Dry

Dry 10
Gas Wells 1
Gas Production 500,000

MONTGOMERY COUNTY.

1-34-14, Ryan, Sharpless et al. 1 ..... Dry
10-30-15, Moulton, Cedar Bluff O. & G. 6 ..... Gas
36-33-14, Mason, Three Sands Oil 5 ..... Dry
36-33-14, Mason, Three Sands Oil 4 ..... Dry
10-33-14, Tucker, Frankson Oil Corp. 15 ..... Dry
2-34-15, G. Flannagan, J. F. Overfield 6 ..... Gas
3-33-16, Blair, Willis & Blaker 1 ..... Dry
22-29-15, Wright, Jesse Graham 1 ..... Gas
33-26-16, McGavern, W. A. Cox 3 ..... Dry
1-29-15, Bryles, New Albany O. & G. 1 ..... Dry
5-30-16, Cane, Unusual Oil & Gas 2 ..... Dry
5-30-16, Cane, Unusual Oil & Gas 3 ..... Dry
34-28-16, Smith, Great Plains O. & G. 3 ..... Dry
1-33-14, Henry, J. F. Overfield 14 ..... Dry

Dry 11
Gas 3
Gas Production 1,000,000

WILSON COUNTY.

18-28-15, Iowa Kansas Oil 1 ..... Dry
28-29-15, Russcat, Henderson, et al. 1 ..... Dry
1-31-16, Reynolds, Cherry O. & G. 1 ..... Dry
19-28-15, Root, Marshall Co. O. & G. 1 ..... Dry

Dry 4

WILDCATS.

Greenwood County—
18-25- 3, Gilroy, Hatfield & Teeter 1 ..... Dry
23-24-13, Lake, Homo Oil 1 ..... Dry
8-26-14, Beasley, Algonia O. & G. 1 ..... Dry
23-25- 8, Jackson, Mid-Kansas O. & G. 1 ..... Dry
1-26- 8, Bryden, Derby & Marshall 1 ..... Dry
10-26- 8, Stanhope, Gt. Southern Oil 4 ..... Dry
9-25-11, Christy, Kans. Distributing 2 ..... Dry
Woodson County—
31-25-16, Schade, Hoy Oil & Gas 1 ..... Dry
26-25-14, Boyer, Davis et al. 1 ..... Gas
22-25-15, Harden, Avona Oil & Gas 5 ..... Gas
Coffey County—
8-20-14, Wagstaff, Danciger Bros. 1 ..... Dry
Elk County—
33-29-13, Doyle, Peerless Oil 1 ..... Dry

Dry 10
Gas Wells 2
Gas Production 1,000,000

OKLAHOMA.

OSAGE COUNTY.

34-22-12, Andre & Shea 6 ..... Dry
15-29-10, Indian Territory Ill. Oil 207 ..... Dry
23-29-10, Indian Territory Ill. Oil 209 ..... Gas
14-26-11, Workman Oil 1 ..... Gas
14-24-11, Osage Oil & Refining 1 ..... Dry
17-21-10, P. O. & G. 5 ..... Dry
7-20-12, Canary & Stillwell 1 ..... Dry
16-24-12, Manhattan Oil 45 ..... Dry
36-27-11, Clover Oil 2 ..... Gas
31-25- 9, Ind. Territory Ill. Oil 217 ..... Gas
4-21-10, Kewanee Oil & Gas 5 ..... Dry
15-24- 8, Pawhuska Oil & Gas 25 ..... Gas
23-26- 9, American Pipe Line 51 ..... Gas
10-25-10, Standish Oil 1 ..... Dry
1-25-11, Boston & Osage 1 ..... Gas
14-24-11, Osage Oil & Refining 2 ..... Dry
10-23-12, Minnehoma Oil 1 ..... Gas
11-26-11, Indian Territory Ill. Oil 1 ..... Gas
4-26-11, Osage Refining 1 ..... Dry
17-27-10, Texas Co. 1 ..... Gas
33-21-12, Carter Oil 2 ..... Dry
24-21-12, Delphos Oil & Gas 1 ..... Dry
27-22-12, Magnolia Pet. 13 ..... Dry
4-23-12, Laurel Oil 49 ..... Dry
1-27-10, Owen & Osage 29 ..... Dry
36-26-11, Clover Oil 2 ..... Gas
31-21-12, Charles Page 1 ..... Dry
32-22-10, E. N. Gillespie 1 ..... Gas
4-21-10, Kewanee Oil & Gas 5 ..... Dry
14-21-12, Monitor Oil & Gas 3 ..... Dry
36-27-11, Indian Territory Ill. Oil 1 ..... Gas
8-26-11, Indian Territory Ill. Oil 1 ..... Gas
2-25- 9, Johnson, Peters & Finance 1 ..... Dry
17-21-10, P. O. & G. and Elmer Oil 5 ..... Dry
4-21-10, Breene, Markham & Sinclair 5 ..... Dry
15-20-12, Texas Co. 1 ..... Dry
31-25-10, Indian Territory Ill. Oil 207 ..... Gas
15-24- 8, Pawhuska Oil & Gas 25 ..... Gas
34-27-11, Iandon et al. 5 ..... Dry
13-29- 9, Indian Territory Ill. Oil 223 ..... Dry
33-22-10, Winona Oil & Markham 12 ..... Gas
36-27-12, Clover Oil 2 ..... Gas

It is not good enough to do good; one must do it the right way.—Morley.

8-26-11, Indian Territory Ill. Oil 224 ..... Gas
5-20-12, F. A. Gillespie 4 ..... Dry

Dry 25
Gas Wells 19
Gas Production 62,000,000

WASHINGTON COUNTY.

Bartlesville, Etc.—
26-27-13, Fee, Dewey P. O. 6..... Dry
16-28-13, Step, Kawfield Oil 13 ..... Gas
32-28-14, Sheets, Lee Daniels 5 ..... Dry
27-25-13, Martin, United Production 1 ..... Gas
29-26-14, Allen, McNeal Johnson 1 ..... Gas
6-26-13, Fee, Natl. Refg. 7 ..... Dry
5-28-15, Winkler, C. S. Kunney et al. 1 ..... Dry
6-28-15, Cookson, McDonald et al. 1 ..... Dry
32-26-13, Vann, Wolfe & Deitz 5 ..... Dry
27-25-13, Martin, United P. & R. 2 ..... Dry
2-27-14, McKay, Cusenberry et al. 1 ..... Dry

Dry 8
Gas Wells 3
Gas Production 3,000,000

NOWATA AND NORTH ROGERS COUNTIES.

15-24-17, Abbie, Nelms, owner not named 1 ..... Dry
7-23-17, Gentry, Premier Oil 2 ..... Dry
18-23-17, Douglas, W. M. Hodson 1 ..... Dry
6-28-14, Cookson, McDonald et al. 1 ..... Dry
1-21-15, Williams, Argue & Compton 1 ..... Dry
2-21-15, Stephens, Nixon & Townsend 2 ..... Dry
2-21-15, Stephens, Nixon & Townsend 1 ..... Gas
2-21-15, Lowney, Nixon & Townsend 1 ..... Dry
10-21-15, Parsley, Don Green 1 ..... Dry
15-21-15, Colcatcher, Don Green et al. 1 ..... Dry
25-21-14, Feland, J. A. Kemmedy et al. ..... Dry
19-22-16, Foreman, Fontenelle Oil 1 ..... Gas
23-22-16, Blackwell Branch O. N. G. 1..... Dry
36-22-16, Foster, John Robertson 1 ..... Dry
1-21-16, Foster, Bird Hitchie et al. 1..... Dry
27-25-17, Flourney, Landon & Stacey 4 ..... Dry
Cherokee Shallow Sands—
22-24-16, Walker, Matt McCormick, agt. 15..... Dry
19-27-16, Suagee, E. B. Lawson 4 ..... Dry
18-26-15, Benton, Byers et al. 1 ..... Gas
17-23-17, Jones, Horner et al. 7..... Dry
33-26-15, Riddle et al., Ohio Cities Gas 5 ..... Dry
18-24-17, Dye, Western Dev. 12 ..... Dry
20-26-15, Kulchinski, J. J. Riner 6 ..... Dry
35-25-16, Kingfisher, Big 500 Oil 4 ..... Dry

Dry 22
Gas Wells 3
Gas Production 1,500,000

TULSA COUNTY.

Bird Creek—
23-21-14, Feland, Sequoyah Oil & Refg. 1..... Dry
6-23-13, McPherson, Texas Co. 1 ..... Gas
35-23-13, Perry, Standard Royalties 1 ..... Dry
13-21-13, Abbott, A. D. Weldy et al. 1..... Dry
26-23-13, Starr, Albina Oil 1 ..... Dry
23-19-13, Tripleton, Miles et al. 1..... Dry
11-22-13, Mitchell, Southwestern Pet. 1 ..... Gas
Red For and Sand Springs—
34-19-12, Templin, Gladys Belle Oil 4 ..... Dry
20-19-11, Rogers, Paxton Oil 2 ..... Gas
34-19-12, Templin, Gladys Belle Oil 3..... Dry
5-19-11, Mitchell, Phoenix Refg. 4 ..... Dry
7-19-11, Island, Page et al. 1 ..... Dry
20-19-11, Thomas, Parker et al. 1 ..... Gas
30-19-11, Payne, Texas Co. 1 ..... Gas
Broken Arrow and Jenks—
16-19-13, Eubank, Miles et al. 4..... Dry
13-18-14, Barnett, Bearman et al. 6..... Dry
34-18-14, Childers, Webster et al. 3..... Dry
31-18-14, Haikey, Reynolds et al. 2..... Dry
6-18-13, Fields, Cline et al. 3 ..... Gas
7-18-15, Presley, Bearman et al. 1..... Gas
7-18-15, Coe, Ice Burg Oil 3..... Dry
32-18-13, Crasley Bros., Ira Short 1..... Dry
8-17-13, Waymore, P. O. & G. 3..... Dry
33-18-14, Hogue, Big Jim Oil 1 ..... Dry
Bixby and Leonard—
28-16-13, Puryear, Caney River Gas 2..... Gas
15-16-13, Tiger Gladys Oil 7 ..... Dry
16-17-13, Wilson, Brown et al. 3 ..... Dry
36-16-13, Brown, Gladys Oil 1 ..... Gas
19-17-13, Berryhill, Brown et al. 1..... Gas
28-16-13, Puryear, Caney River Gas 1 ..... Gas
8-17-13, Crosby, P. O. & G. 2 ..... Dry
18-17-13, Manuel, O. C. Graves et al. 3..... Gas
6-16-13, Murray, Shields et al. 4..... Dry
6-16-14, Posey, Okla. Oil 2 ..... Dry

Dry 22
Gas Wells 12
Gas Production 40,000,000

OKMULGEE COUNTY.

Mounds—
2-16-11, Behan, Inland Refg. 5 ..... Dry
4-16-11, Tah Con We Nay, Sinclair O. & G. 4..... Dry
12-16-11, Atkins, H. F. Wilcox 1 ..... Dry
26-16-11, Lannen, P. O. & G. 1..... Dry
15-16-11, Smock, Tulley et al. 4..... Dry
34-16-11, Ross, Paraffine Oil 1 ..... Gas
20-16-12, Stevens, Wilcox et al. 2..... Dry
27-16-11, Davis, Clark, Krebs et al. 1..... Dry
4-16-11, Big Pond, U. H. Bartlett 2 ..... Dry
33-16-11, Cousin, Texas Co. 1 ..... Dry
36-16-11, Grayson, Producers & Refiners 1 ..... Dry
30-15-12, Furchtbar, C. B. Shaffer 2 ..... Dry
33-16-11, Cousin, Walters et al. 1..... Dry
33-16-11, Peters, Eastern Oil ..... Dry
9-16-12, Penoka, Jack Pot Oil 1..... Gas
22-16-11, Jones, Brandon Co. 1..... Gas
26-16-11, Grayson, Paraffine Oil 4 ..... Dry
11-16-12, Barnett, Clark, Alexander et al. 3..... Dry
Okmulgee and Morris—
2-13-13, Highbower, Nile Oil & Gas 3..... Dry
30-13-13, Harjo, Barbara Oil 5 ..... Dry
17-13-14, Doyle, Terrall & Dixon ..... Dry
13-13-13, Brown, Gainsmoore Oil 6 ..... Dry
30-13-13, Harjo, Barbara Oil 4 ..... Dry
8-13-14. Myers, Lewcinda Oil 4 ..... Dry
9-13-13, Sone, Dixie Oil 2 ..... Gas
4-13-14, Toshea, Alexander & Preston 3 ..... Dry
19-13-14, Wood, Kingwood Oil 2 ..... Gas
Bald Hill and Booch Sand—
2-15-14, Anderson, Solander Oil 4 ..... Dry
9-14-13, H. Joane, French & Luttes 1 ..... Dry
36-14-13, Grayson, W. B. Pine 1 ..... Dry
29-14-14, Ashley, Sperry Oil & Gas 5 ..... Dry
2-14-13, Leader, Ohio Cities Gas 3..... Dry
19-1-154, Perryman, Smith et al. 6..... Dry
4-14-14, Gray, Twin State 1 ..... Dry
21-15-13, Kelly, Fred Strome et al. 1 ..... Gas
1-14-14, Harris, Reno et al. 1..... Dry
16-14-13, Jefley, Okmulgee P. & R. 3..... Dry
25-16-14, Grayson, Carr & Peterson 2 ..... Gas
19-15-14, Perryman, Laverge O. & G. 4 ..... Dry
2-15-14, Anderson, Solander Oil 3 ..... Dry
33-14-13, Watson, E. R. Black 2 ..... Gas
17-14-14, Moore, Galloway et al. 2..... Dry
21-14-14, Morris, Cary Jennings 3 ..... Dry
21-14-14, Grayson, Sperry Oil & Gas 15 ..... Dry
22-14-14, Wright, McClelland & Kingwood 5 ..... Dry
Hamilton Switch and Beggs—
4-15-11, Sevier, E. R. Minehall 2 ..... Dry
30-15-12, Johnson, W. M. Thompson 2..... Dry
25-14-12, McKellop, Donnelly et al. 1..... Dry
27-14-12, Grayson, J. W. Moore 1 ..... Dry

After all there is but one race—humanity.—Moore.

10-15-12, Thorpe, Turman Oil 1 ..... Dry
24-15-12, Nelson, H. F. Wilcox 1 ..... Dry
25-14-12, Kanard, Kimbley et al. 1 ..... Gas
18-14-13, Berryhill, Mid-Con. O. & D. 4 ..... Gas
27-14-12, Grayson, J. W. Moore et al. 1 ..... Dry
13-15-11, Gordon, Turman Oil 1 ..... Gas
34-15-11, Coleman, Wilcox et al. ..... Gas
Youngstown and Tiger Flats—
23-12-11, Barnett, J. Hartman 3 ..... Dry
3-13-12, Lovett, Barnard Oil 2 ..... Dry
35-14-12, Narcone, L. S. Skelton 1 ..... Gas
25-14-11, Fee, Texas Co. 8 ..... Dry
25-14-11, Doyle, Lucky Lease Oil 1 ..... Dry
26-14-11, Doyle, Petroleum Co. 1 ..... Gas
7-13-12, Grayson, Alexander et al. 1 ..... Dry
8-12-12, Ryan, Monitor Oil & Gas 5 ..... Dry
25-14-11, Fee, Texas Co. 9 ..... Gas
9-13-12, Brinton, Bradstreet et al. 1 ..... Gas
25-13-12, Holleyman, P. O. & G. 1 ..... Gas
9-12-12, Thompson, Okla. State Oil 3 ..... Gas
35-13-12, Atkins, C. B. Shaffer 2 ..... Dry
9-12-12, Sarakoche, Monitor O. & G. 3 ..... Gas
25-14-11, Huckaby, Okmulgee P. & R. 9 ..... Dry
25-14-11, Huckaby, Okmulgee P. & R. 11 ..... Dry
25-14-11, Huckaby, Okmulgee P. & R. 13 ..... Dry
9-13-12, Smith, Crescent Oil 1 ..... Gas
25-13-12, Holleyman, P. O. & G. 1 ..... Gas
23-13-12, Martin, J. H. Lyons 1 ..... Dry

Dry 55
Gas Wells 21
Gas Production 150,000,000

MUSKOGEE, WAGONER AND ROGERS.

Inola—
19-18-15, Tiger, Webster et al. 4 ..... Dry
7-18-15, Presley, Bearman et al. 1 ..... Gas
24-18-15, Derrisaw, Wright Prod. 1 ..... Dry
33-19-15, Roberts, Talbot et al. 1 ..... Dry
7-18-15, Escoe Lydecker et al. 3 ..... Gas
Coweta—
19-17-15, McIntosh, Sextet Oil & Gas 1 ..... Dry
19-17-15, Crowell, Hugo & Harris 1 ..... Dry
29-17-15, Atkins, Gardner, Heggam & Davis 1 ..... Gas
Catoosa—
27-20-14, McIntosh, Swift et al. 1 ..... Dry
Haskell—
31-16-15, Rowe, Three S. Oil 3 ..... Dry
19-15-16, Harrison, Scully et al. 2 ..... Dry
19-15-16, Harrison, Geo. Lowerre 1 ..... Dry
1-15-16, Grayson, Penn Wyoming Oil 1 ..... Dry
26-16-15, Taylor, Cosden O. & G. 5 ..... Gas
36-15-15, Colbert, Acme Oil 1 ..... Dry
36-15-15, Durant, Sculley & Summers 6 ..... Gas
11-16-15, Berryhill, Hogan et al. 1 ..... Dry
36-15-15, Durant, Sculley & Summers 6 ..... Gas
24-15-16, Grayson, Damme-Pringle Oil 2 ..... Gas
30-16-15, Grayson, Livingston Oil 3 ..... Dry
30-16-15, Grayson, Carter Oil 6 ..... Dry
17-15-16, McDaniels, Muskahoma O. & G. 1 ..... Gas
32-15-18, Blackstone, Sun Gasoline 9 ..... Dry
13-15-16, Perryman, Jas. Whitesides 2 ..... Dry
36-15-15, Colbert, Kiskadden et al. 1 ..... Dry
8-16-15, Barnett, Bell O. & G. 8 ..... Dry
29-16-15, Lee, Lorena McM. Oil 9 ..... Dry
31-16-15, Asbury, B. G. Goble 1 ..... Dry
24-15-15, Grayson, Damme-Pringle Oil 2 ..... Dry
17-15-16, McDaniels, Muskahoma Oil 3 ..... Gas
17-15-16, McDaniel, Peterson & McMann 2 ..... Gas
Boynton District—
25-13-16, Frances, Navy O. & G. 2 ..... Dry
21-13-15, Sango, Anderson & Johnson 1 ..... Gas
1-14-15, Manuel Gulick et al. 3 ..... Dry
4-14-15, Jefferson, Hanson O. & G. 8 ..... Dry
19-14-15, Rentie, Chestnut & Smith 3 ..... Gas
6-13-15, Foster, F. J. Lambert 2 ..... Dry
18-14-16, Sugar, Boynton O. G. 1 ..... Dry
6-14-16, Franklin, Presto O. & G. 1 ..... Dry
7-14-16, Franklin, Cosden O. & G. 1 ..... Dry
4-13-15, Taylor, Credo O. & G. 2 ..... Dry
17-13-15, Sango, P. O. & G. 1 ..... Dry
30-13-17, Tiger, Navy O. & G. 1 ..... Gas
24-24-16, Tipton, Little Pool Oil 2 ..... Dry
7-13-15, Freeman, Rebold et al. 2 ..... Gas
Muskogee, Etc.—
32-15-18, Meagher, Henry Oil 2 ..... Dry
12-14-18, Davis, Penn Wyoming Oil 1 ..... Dry
27-15-17, Shaffer, Garrett et al. 1 ..... Gas

Dry 33
Gas Wells 15
Gas Production 58,000,000

CREEK COUNTY.

Glenn Pool—
23-17-11, Barnett, Danciger & Stout ..... Dry
34-17-12, Agent, Swoveland et al. 1 ..... Gas
28-18-11, George, Hughes et al. 4 ..... Dry
2-18-12, Huddleston, Pulaski Oil 8 ..... Dry
11-18-12, Smith, Mickelson et al. 3 ..... Gas
23-17-11, Barnett, J. Stout et al. 1 ..... Dry
23-17-11, Tate, Danciger et al. 7 ..... Dry
2-17-10, Self, Healdton O. & G. 1 ..... Dry
1-18-12, Barnett, Welchner & Short 3 ..... Gas
19-17-11, White, Rushton O. & G. 4 ..... Dry
23-17-11, Thompson, Rocky Mt. M. & P. 2 ..... Dry
Cushing and Olive—
35-19-7, Jessie, H. U. Bartlett 10 ..... Dry
6-16-8, Wills, Cushing Dev. 2 ..... Dry
36-18-7, Jones, Magnolia Pet. 1 ..... Gas
34-17-7, Boone, Magnolia Pet. 2 ..... Gas
13-17-7, Timothy, Cosden O. & G. 1 ..... Dry
34-17-7, Mitchell, Iron Mtn. Oil 21 ..... Gas
Mannford—
13-18-10, Anderson, Texas Co. 1 ..... Dry
Kellyville—
3-17-10, Taylor, Eastern Oil 2 ..... Dry

Dry 13
Gas Wells 6
Gas Production 30,000,000

PAWNEE COUNTY.

Cleveland, Etc.—
21-20-7, Hosic, P. O. & G. 10 ..... Dry
12-21-8, Moore & Bradstreet 31 ..... Dry
21-21-7, Beard, U. S. Oil 1 ..... Dry
4-20-7, Shanahan, Kansas Securities 1 ..... Dry
Maramec—
1-20-7, Little, Selby Oil 1 ..... Gas

Dry 4
Gas Wells 1
Gas Production 4,000,000

PAYNE COUNTY.

Yale, Etc.—
11-18-5, Cole, Roma Oil 1 ..... Gas

Gas Production 15,000,000

KAY COUNTY.

8-26-3, Doughty, Big Protection Oil 2 ..... Dry
30-28-1, Willett, Duluth, Okla. Oil 1 ..... Dry
31-29-1, Shurtz, Empire G. & F. 4 ..... Gas
31-29-1, Pratt, Junction Oil 3 ..... Dry
20-28-1, Welsh, Southwestern Oil 7 ..... Gas
15-27-1, Smitherman, Cherokee O. & G. 3 ..... Dry
6-28-1, Wolf, Kay & Kiowa 7 ..... Gas
17-28-1, Welch, Southwestern Oil 9 ..... Gas
18-28-1, Curry, Kay & Kiowa 8 ..... Gas
8-25-2, Primeaux, Maroand et al. ..... Dry
30-29-1, Hobaugh, Empire G. & F. 2 ..... Gas
31-29-1, Pratt, Empire G. & F. ..... Gas

Necessity has no law.—Rabelais.

[illegible] Empire [illegible] & [illegible] Gas
[illegible] McMichael Marland & Sinclair [illegible] & [illegible] Gas

[illegible] Wells [illegible]
[illegible] Production [illegible]

GARFIELD AND NOBLE COUNTIES

[illegible] District
[illegible] Washburn [illegible] Gillespie [illegible] Dry
[illegible] Land Tuloma [illegible] Dry
[illegible] Sisson [illegible] Dry
[illegible] Amber [illegible] Dry

CARTER COUNTY

[illegible] and [illegible]
[illegible] Dry
[illegible] Dry
[illegible] & Sinclair Gulf Gas
[illegible] Wagoner & Smith [illegible] Dry
[illegible] Beatty [illegible] Dry
Fagan & Johnson [illegible] & Sinclair [illegible] Gas
[illegible] Magnolia [illegible] Dry
[illegible] International [illegible] Dry

[illegible]

WILDCATS AND MISCELLANEOUS

[illegible]

Kay County
[illegible] W. Humphreys [illegible] Gas

Dry [illegible]
Gas Wells [illegible]
Gas Production [illegible]

KANSAS

SUMMARY OF WELLS COMPLETED

Butler [illegible]
Chautauqua [illegible]
Montgomery [illegible]
[illegible]
Wilson [illegible]
Allen [illegible]
Neosho [illegible]
[illegible]

Total [illegible]

OKLAHOMA

SUMMARY OF WELLS COMPLETED

[illegible]

KANSAS-OKLAHOMA-ARKANSAS

[illegible]

WYOMING

[illegible]

NORTH TEXAS

WICHITA AND WILBARGER COUNTIES

[illegible]

What is well done is done soon enough. Du Bartas

Waggoner, Texas Co. 156	Dry
Granger, North Texas Oil 1	Dry
Granger, North Texas Oil 2	Dry
Spradley, Aubrey et al. 1	Dry
Burnett, Southwestern Pet. 1	Dry
Ban-Loh, Citizens Oil & Gas 1	Dry
Douglas, Harmony Oil 2	Dry
Pierce, Osage Oil 1	Dry
Fisher, Electra-New Mexico Oil 1	Dry
Fisher, Granite Oil & Gas 1	Dry
Dry	11

BURKBURNETT AND LOCALITY.

Evans, Sanders-Taylor Oil Assn. 8B	Dry
Birk, Fieher, et al. 1B	Dry
Birk, Davis & Coggin 1	Dry
Lindsel, Posey Oil 1	Dry
Moore, Submarine Oil 1	Dry
Clarke, Moore et al. 1	Dry
Warren, Monday Oil 1	Dry
Serrin, Humble Oil & Ref. 19	Dry
Dry	8

EASTLAND COUNTY.

Stuart, Texas & Pacific Coal	Gas
Gas Production	3,000,000

STEPHENS COUNTY.

Veale, T. & P. Coal 1	Gas
Barron, T. & P. Coal 1	Dry
G. & A. T. T., T. & P. Coal	Dry
Dry	2
Gas	1
Gas Volume	10,000,000

WILDCATS.

Shackleford County—	
Snyder, DeArmond & Co. 1	Dry
Garlitz, Hoske et al. 1	Dry
Hubbard, Woods et al. 1	Dry
Archer County—	
Kemp & Kempner, Coline Oil 1	Dry
Near Dundee, Roxana Pet. 1	Dry
Dry	5

CLAY COUNTY.

Van Winkle, Lone Star Gas 1	Dry
Miller, Lone Star Gas 1	Dry
Crowther, Lone Star Gas 1	Dry
Dry	3

NORTH TEXAS-PANHANDLE.

SUMMARY OF COMPLETED WORK.

District	Comp.	Prod.	Dry	Gas
Electra	31	1,086	11	0
Sunshine Hill	23	166	0	0
Burkburnett	41	1,057	9	0
Clay County	3	0	3	0
Eastland County	5	2,595	0	1
Stephens County	3	0	2	1
Brown County	22	320	0	0
Miscellaneous	9	35	5	0
Total	137	5,259	30	2

NORTH LOUISIANA.

CADDO.

34-20-15, Noel, Texas Co. B-3	Dry
15-20-16, Ferry Lake, Gulf Refg. 149	Dry
27-21-15, Christian, Richardson Oil 2	Gas
34-20-16, Newberry, Ark. Nat. Gas 69	Dry
12-21-15, Youree, Kinnebrew & Ratcliff 1	Gas
34-21-15, La R. E. & D., Wyoming Oil 1	Dry
De Soto—	
25-13-12, G. B. P., Texas Co. 20	Dry
Bossier—	
8-16-11, Kelly, Texas Co. 1	Gas
8-16-11, Smith, Ark. Nat. Gas 72	Gas
29-16-11, McDade, Standard Oil 1	Gas
23-16-12, Hunter, Southwestern G. & E. 168	Gas
Miscellaneous—	
13-20- 3, Union Sawmill, Federal Pet. 1	Gas
2-11-14, Baker, Federal Pet. 3	Dry
10-20- 4, Perry, Perryville O. & G. 1	Dry
Dry	7
Gas Wells	7

NORTH LOUISIANA.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry	Gas
Caddo	35	11,975	4	2
De Soto	2	25	1	0
Red River	1	75	0	0
Bossier	5	100	0	4
Miscellaneous	3	0	2	1
Total	46	12,175	7	7

GULF COAST.

HUMBLE.

Koehler, The Texas 20	Gas
Landslide, The Texas 227	Gas
Rosenthal, Six Hundred Oil 1	Dry
Bailey, Weimar Oil 4	Dry
Landslide, Jack Rose Oil 5	Dry
Gas	2

GOOSE CREEK.

Galliard fee, Gulf Production 11	Gas

ANSE LA BUTE.

Martin, Martin Oil 1	Dry

TEXAS-LOUISIANA.

SUMMARY OF OPERATIONS.

North Texas	137	2,595	30	2
North Louisiana	46	12,175	7	7
Gulf Coast	170	58,886	68	5
Total	353	76,320	105	14

HONOR ROLL IN NEW FORM.

THE Denver Gas & Electric Company, a Henry L. Doherty subsidiary, has arranged for a Roll of Honor, made of metal which is to contain a name plate for each man who has entered the service. It is a decorative creation in wide use in eastern states.

The company has also constructed an electric service flag which has been placed in its office in Denver. This company is selling small flags made of glass which are illuminated by one lamp.

No man can climb out beyond the limitations of his own character.—Morley.

PRICE OF PETROLEUM

abilizing Both Price and Fair Differential

Man is but a reed the weakest in nature, but he is a thinking reed Pascal

AROUND THE BELT

New Wells, New Pipe Lines, New Contracts, Additions and Extensions. A Fund of Valuable News Gathered for the Journal Through Many Sources.

TRADE PERSONALS

AGRICOLA, OTTO, is president of the Gadsden Oil & Gas Company, Gadsden, Ala., recently formed for the purpose of drilling for gas in the vicinity of that city.

BEACH, MRS. W. H., has been appointed Manager of the Mount Morris, N. Y., office of the Pavilion Natural Gas Company.

BEERBOWER, LINCOLN, Manager of the Enid division of the Oklahoma Gas & Electric Company, Enid, Okla., has been appointed Chairman of the Industrial Committee of the Chamber of Commerce for the ensuing year.

CORN-GARRISON, LESLIE, a member of the force of the Empire Gas & Fuel Company, who went to France with the 85th Company, 6th Regiment of the U. S. Marines, has been killed in action.

CORRIN, JOHN B., recently became Assistant General Manager and Vice-President of the Hope Natural Gas Company, and Vice-President and General Manager of the Reserve Gas Company, and the River Gas Company.

CRITCHFIELD, C. V., gas expert of the Ohio Public Utilities Commission, it is reported, will establish himself as consulting engineer on his own account in Columbus, Ohio.

ERICKSON, HALFORD, formerly Chairman of the Wisconsin Corporation Commission, and recently of the firm of Hagenah & Erickson, Chicago, has been elected vice-president of the Louisville Gas & Electric Company, Louisville, Ky.

FISHER, J. G., distribution superintendent of the Drumright, Okla., division of the Oklahoma Gas & Electric Company, has been called into military service.

GARRISON, N. I., Manager of the El Reno, Okla., division of the Oklahoma Gas & Electric Company, has been elected vice-chairman of the Canadian County Chapter of the Red Cross.

GROSSCUP, HON. FRED P., of Charleston, West Va., has been elected President of the West Virginia Natural Gas Association.

HALL, CLARENCE, formerly chief accountant of the Marshall Gas Company, Marshall, Tex., has been elected Manager-Secretary-Treasurer of the company.

HERMES, H. H., Manager of the New Business Department of the Oklahoma Gas & Electric Company, Oklahoma City, Okla., has been appointed Illuminating Engineering Administrator for the State of Oklahoma.

HARRIES, LIEUT. WARREN G., youngest son of Brigadier General George H. Harries, formerly vice-president of H. M. Byllesby & Company, was recently killed in an automobile accident in France.

HUNTLEY, L. G., of the firm of Johnson & Huntley, geologists, Pittsburgh, Pa., has been elected President of the Island Oil & Transport Corporation. No change occurs in the firm through Mr. Huntley's new connection.

LAYTON, M. B., has undertaken the duties of Manager of the Manufacturers' Light & Heat Company, Pittsburgh, Pa., succeeding T. O. Sullivan, who is now with the Hope Natural Gas Company.

MANDEVILLE, LIEUT. FULTON, formerly of the Commercial Department of the Louisville Gas & Electric Company, Louisville, Ky., has been promoted to the rank of captain in the 327th Machine Gun Battalion of the Lincolnville Division. Capt. Mandeville graduated from the officers' training camp at Fort Benjamin Harrison last year and received a commission as First Lieutenant.

MYERS, W. D., of the Commercial Department of the Louisville Gas & Electric Company, Louisville, Ky., has accepted a position with the Louisville War Industries Commission and will represent the commission in Washington in an effort to direct war material contracts towards Louisville's industries.

O'BRIEN, JOHN J., Vice-President and Treasurer of H. M. Byllesby & Company, Chicago, has been appointed a member of the Capital Issues Committee for the seventh Federal Reserve District.

OWENS, J. F., Vice-President and General Manager of the Oklahoma Gas & Electric Company, has been appointed Chairman of the New Industries Committee of the Chamber of Commerce of Oklahoma City, Okla.

POWELL, A. J., of Bartlesville, Okla., is engaged in compiling a directory of companies operating in the Mid-Continent fields.

ROBINSON, EDWIN, of Fairmont, West Va., has been re-elected Secretary-Treasurer of the West Virginia Natural Gas Association.

RYDEN, A. J., of Minneapolis, Minn., recently accepted appointment on the staff of the Empire Gas & Fuel Company, Augusta, Kan. His duties will be in connection with the purchasing end.

SEDBERRY, W. H., formerly Manager-Secretary-Treasurer of the Marshall Gas Company, Marshall, Tex., recently became affiliated with the interests of W. B. McCormick, Terrebonne Gas Company, Houma, La.

SHEPARD, MISS WINNAFRED, of the University of Michigan, recently joined the sub-surface branch of the department of geology of the Empire Natural Gas & Fuel Company, Bartlesville, Okla. Miss Shepard is the fourth woman to join the Empire Company's geological department.

SOUTH, W. H., of Morganstown, West Va., at the annual convention of the West Virginia Natural Gas Association at Huntington, West Va., was elected Vice-President of that association.

One may be humble out of pride.—Montaigne.

SULLIVAN, T. O., General Manager of the Manufacturers' Light & Heat Company, Pittsburgh, Pa., for a long period of years, is now General Manager of the Hope Natural Gas Company, Pittsburgh, Pa.

WILLIAMS, W. G., Results Engineer of the Empire Gas & Fuel Company, Oklahoma City, Okla., has been appointed engineer in charge of fuel conservation in the mid-continent field by the petroleum division of the United States Fuel Administration. The appointment is for the duration of the war and Mr. Williams will have his office in Oklahoma City.

WINNINGHAM, C. C., of Detroit, has been appointed Chief of the Gasoline Section and Director of Publicity of the Oil Division of the Bureau of Oil Conservation.

INCORPORATED

ALABAMA—Gadsden

The Gadsden Oil & Gas Company, with a capitalization of $300,000, has been organized here for the purpose of drilling for gas in Owl Valley on the northern edge of the city.

The officers are: Otto Agricola, president; A. S. McGregor, vice-president; J. L. Herring, secretary and treasurer. The directors are: Otto Agricola, A. S. McGregor, J. L. Herring, O. R. Hood, J. S. Moragne, A. P. Reich, F. P. Jackson and W. C. Ware.

INDIANA—Terre Haute

The Volunteer Oil & Gas Company has been incorporated with a capital stock of $50,000. The company will do business in this city. The incorporating members are: A. L. Pfau, Julius Lederer, William E. Eppert, James H. Swango, and Samuel T. Greenburg. The same were named as a board of directors.

OKLAHOMA—Enid

The Enid Oil & Gas Company has been formed with a capital stock of $300,000. The incorporators are: Glen Walter, W. Singer and the Rev. W. R. Dodd, all of Enid.

NEW FRANCHISES

CALIFORNIA—Los Angeles

The Southern Counties Gas Company has been granted a franchise to lay pipes and furnish natural gas to the industries and homes in the Los Angeles harbor district. It is a blanket franchise.

LOUISIANA—Houma

The Houma City Council has acted on the McCormick franchise to bring natural gas to Houma by October 1, and on recommendation of the city attorney and with some changes, the franchise has been granted.

OHIO—Wauseon

H. A. Dempsey of Lakewood, has been granted a franchise to supply this town with gas. Mr. Dempsey recently drilled in a good gas well in the vicinity of Wauseon, and claims to have sufficient production to supply the town. The rate charged will be 50 cents per thousand.

PER CUBIC FOOT—RATES

ARKANSAS—Pine Bluff

The Arkansas Natural Gas Company has advanced its rates 5 cents per thousand. The new rate is 48 cents per 1,000 for the first 50,000 cubic feet, as compared with 43 cents for the first 10,000 cubic feet, and 38 cents for the next 10,000 cubic feet.

Texarkana

The Southwestern Gas & Electric Company has increased its rates from 30 to 40 cents per thousand.

CALIFORNIA—Whittier

The Southern Counties Gas Company has put in effect the following rates:

Eastern District, including Orange County, Whittier, Pomona and Monrovia: First 1,000 cubic feet, $1; next 4,000 feet a month, 80 cents a thousand, and ranging down to 35 cents a thousand for more than 100,000 feet monthly. When there is insufficient gas to supply all consumers, priority is given to plants for gas engines, bakeries, packing houses, large industries, such as metal working plants, fruit establishments and so forth.

Rates for the Southern, or San Pedro district are:

First 2,000 cubic feet, 90 cents a thousand; next 8,000 feet, 75 cents a thousand and ranging down to 40 cents a thousand for all over 100,000 cubic feet.

These rates will be a reduction to some and an increase to others. New rates for the Western District, including Santa Monica, Venice, Ocean Park, Culver City, Palms, Sawtelle and adjacent territory are:

First 2,000 feet, $1.15 a thousand; next 8,000 feet, 95 cents a thousand and ranging downward to 60 cents a thousand for all over 40,000 feet.

MISSOURI—St. Joseph

The St. Joseph Railway, Light, Heat & Power Company has filed a petition with the Missouri Utilities Commission asking for a 20 per cent. increase in heating rates.

NEW YORK—Corning

The Crystal City Gas Company has been denied the right at the present time to increase the rate per 1,000 cubic feet in Corning. The consumers in that city have been paying 45 cents a thousand, with a discount of 5 cents a thousand for prompt payment. The company sought to increase the price to 58 cents a thousand, with a discount of 5½ for prompt payment.

Dunkirk

The South Shore Natural Gas Company has filed a petition with the Public Utilities Commission asking

There is great ability in knowing how to conceal one's ability.—La Rochefoucauld.

permission to increase its rate for industral gas to 27 cents per housand.

Lancaster

The Depew & Lancaster Light, Power & Conduit Company has filed with the Public Service Commission. Second District, changes in its tariff schedules which it proposes as effective on September 1st, in Lancaster and East Lancaster. Changes proposed are: Low pressure natural gas, minimum charge increased from 30 to 50 cents a month. Straight rate of 32½ cents per thousand cubic feet, changed to 37 cents for the first 40,000 cubic feet and 42 cents for excess of 40,000 cubic feet. Prompt payment discount changed from 2½ to 2 cents per thousand cubic feet.

Le Roy

The Tri-County Natural Gas Company of Caledonia is asking an increase in its rates.

Williamsville

The Williamsville Natural Gas Company is asking permission to increase its rate from 45 cents to 55 cents per thousand, gross.

West Seneca

The People's Natural Gas Company of Buffalo has filed with the Public Service Commission, Second District, rate changes for gas in the town of West Seneca, which it proposes to put into effect on August 25h. The present rate of 32 cents a thousand cubic feet, with a prompt payment discount of two cents per thousand cubic fee, will be succeeded by rates as follows: Thirty-seven cents per thousand cubic feet for first 40,000 cubic feet consumed in a month and 42 cents per thousand cubic feet for all gas consumed in a month over 40,000 cubic feet with a prompt payment discount of two cents per thousand cubic feet.

OHIO

In all Ohio cities served by the Doherty interests, except Mansfield, the rates for natural gas have been increased on an average of 50 per cent. There was no increase applied for in the city of Mansfield.

Lima

The Lima Natural Gas Company has filed a new schedule of rates with the local city officials. This schedule provides for a gas rate of fifty cents per thousand cubic feet for the first 25,000 feet; sixty cents for the next 5.000 feet, and seventy cents per thousand for from 30,000 to 35,000 feet. The present rate is thirty-three cents per thousand.

Oberlin

The Pittsfield Gas Company has increased its rate to 45 cents per thousand. The former rate was 40 cents gross.

OKLAHOMA—Bristow

The Bristow Gas Company has been granted permission to put in operation a rate of 35 cents per thousand for domestic gas, and a sliding scale for industrial purposes, the minimum charge of which is 15 cents. These rates constitute a raise over those previously in force.

Oklahoma City

The Oklahoma Natural Gas Company has been granted permission to increase its minimum rate to 20 cents per thousand, subject to 10 per cent. discount. The new rates will affect Enid, El Reno, Muskogee, as well as this city.

PENNSYLVANIA

The American Natural Gas Company and the Gilpin Natural Gas Company, operating in the counties of Allegheny, Armstrong, Butler, Indiana and Westmoreland, have filed with the Public Service Commission a new tariff of rates, to become effective on August 24, 1918. The new tariff increases the rate to consumers in Class 1—domestic consumers and other customers using gas in limited quantities—from 30 cents net to 35 cents net per thousand cubic feet.

Chicora

The Prospect Oil & Gas Company and the Hoch Brothers Natural Gas Company have increased their rates from 25 cents net to 30 cents net per thousand. The Hoch Brothers Natural Gas Company in addition has made provision for an increase from 15 cents to 20 cents per thousand for large quantities.

GENERAL

ALABAMA—Gadsden

The Gadsden Oil & Gas Company, recently formed here, has taken options on a large section of land in Owl Valley and a contract has been let for one well, work to begin shortly. The well will be drilled in the neighborhood of one which was started in 1868, at which time, it is said, gas was found at a depth of 484 feet.

CALIFORNIA—San Pedro

Application has been made by the Southern Counties Gas Company to the United States engineers for permission to lay an eight-inch steel gas pipe line across the east basin channel, which will serve as a permanent gas line to serve the Fish Harbor and Terminal Island industries. This service will be of great value to the rapidly developing shipbuilding industry in this district.

Whittier

The Southern Counties Gas Company is building a 6,000-foot pipe line from a point near the McGinley wells at Montebello and connecting with the Shell lease. This line will supply gas for drilling purposes to Keller & Taussig, the Potter Oil Company and the Shell company. The Southern Counties Gas Company is now serving with gas all the companies operating in the local field with the exception of the Standard.

The Standard is supplying the gas company with 1,500.000 cubic feet of gas daily, and has enough left to take care of its own requirements.

COLORADO—Flagler

The Flagler Oil & Gas Company, drilling one-hali mile northwest of town, at a depth of 1,640 feet struck

'Tis what you will—or will be what you would.—Du Bartas.

Campbell Hill

Silence is the best reply for him who [illegible]

posed of New York and Chicago interests, that the floating debt has been funded, and that ample funds for further development work on its oil leases in Kentucky and expansion of its refinery have been provided.

OHIO—Ashland County

In Lake Township, Ashland County, a small gas well is reported on the Barnard farm. In Perry Township, the Ohio Fuel Supply Company, finished a fair gas well on the W. A. Shissler farm, Section 3. In Mohican Township the same company has a gas well in a test on the Z. W. Zimmerman farm, Section 10.

Camden

The Camden Oil & Gas Company developed a light flow of gas at a depth of 800 feet recently in a location east of town. It is said that other drilling operations in this section will be undertaken.

Cuyahoga County

In Dover Township, the East Ohio Gas Company drilled a good gasser in No. 2.

Findlay

The city recently developed a gas well near Findlay, the production of which will be utilized under the boilers of the water plant. This will save the plant something like 200 tons of coal annually.

Fulton County

H. A. Dempsey of Lakewood drilled in a good gasser at a depth of 2,250 feet on a lease of 1,000 acres, a short distance from Wauseon. The gas will be piped to Wauseon.

Lorain

The Logan Natural Gas & Fuel Company, according to report, will shortly put in commission its new gasoline compressing plant located at a point between Lorain and Elyria. The plant will have a capacity of between 500 and 600 gallons of gasoline a day.

Medina County

In Lafayette Township, the Medina Gas & Fuel Company drilled a good gasser in No. 2, D. C. Weightman farm, Section 31.

Toledo

According to report the third gas well the city has drilled for the use of its water works plant will flow more than 30,000 cubic feet of gas daily and will save the city about $25 per day in coal.

Wayne County

In Clinton Township, the Medina Gas & Fuel Company drilled a good gas well on the C. E. Brown farm, Section 16.

In Chippewa Township, the East Ohio Gas Company completed a gas well on the A. and E. Repp farm, Section 21.

Gas Pressure

Its Effect on Natural Gas Cooking Operations in the Home — Based on Tests Made in the Laboratory of the Department of Home Economics, The Ohio State University, Columbus, Ohio — Under the Direction of Edna Noble White, Head of Department of Home Economics, Grace Linder, Instructor in Home Economics, and Samuel S. Wyer, Consulting Engineer, Columbus, Ohio.

SECTION I.
INTRODUCTION

THE determination of "what is usable natural gas pressure for cooking service" has long been desirable. Since more than 50 per cent of all of the natural gas consumers in the United States live in Ohio, and 73 per cent of Ohio's population are dependent on natural gas for their cooking service, it became evident that the problem had a vital relation to the homes of the State and that the Home Economics Department should undertake to obtain accurate data to answer this much discussed and misunderstood question.

The primary object of the tests was to duplicate household operations rather than make laboratory comparisons. Although a water calorimeter, such as described in Vol. 1, page [illegible] of the Proceedings of the American Gas Institute for 1906, would give a slightly higher efficiency for the burner, we thought it better to measure the efficiency with an ordinary cooking vessel rather than with the more refined calorimeter which would be of no interest to the gas user. We believe usability or usability may be of more importance than mere efficiency; tests were therefore made to determine exactly what results could be obtained with ordinary kitchen utensils, from the very lowest to the highest pressures that might be found in a natural gas distributing plant.

The routine work of the tests under constant supervision was carried on by the Misses [illegible] and Kirkpatrick, Nolan and Steiger, members of the Department's senior class.

Part I.
EXPERIMENTAL DATA TO DETERMINE EFFECT OF PRESSURE ON NATURAL GAS COOKING OPERATIONS

1. DESCRIPTION OF APPARATUS

The apparatus used in the tests is shown in Figures 1 and 2. A [illegible] meter prover is shown at the right. The pressures were increased by placing weights on top of the meter prover as shown. The

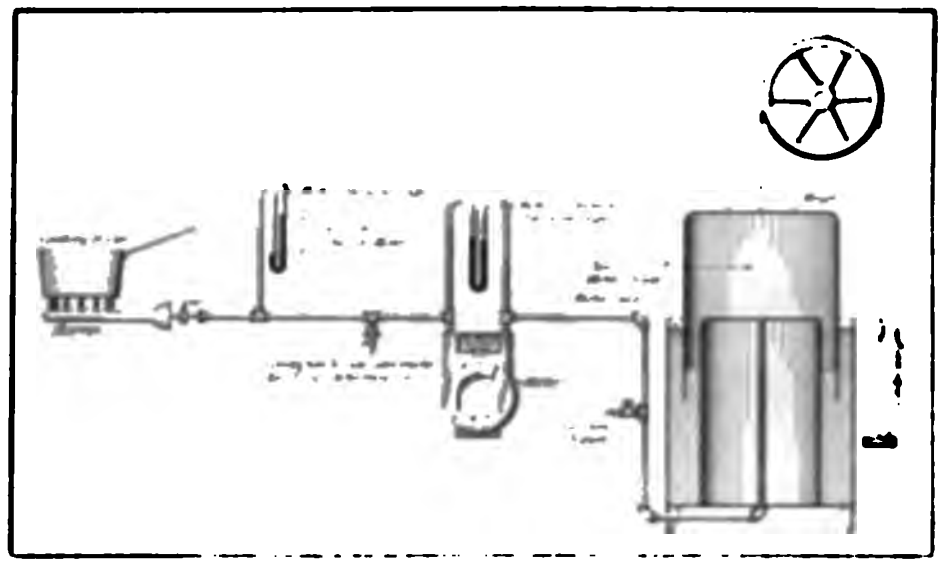


Fig. [illegible]

air in the [illegible] was passed into the meter [illegible] weights were [illegible] the desired pressure.

The gas was measured [illegible] meter. Pressure gauge attached [illegible] pressure [illegible] meter [illegible] amount of gas pressure necessary to operate the meter. This was found to be [illegible] inch of water pressure. The pressure at the cooking features was determined by the [illegible] pressure gauge and measured in ounces per square inch by means of a scale graduated in ounces.

Referring to Fig. 1, the stove at the extreme left is a natural gas range with adjustable spud similar to the one shown in Fig. 14. The stove in the middle is a range designed for manufactured gas with [illegible] spud having a [illegible]

He that has patience may compass anything. — Rabelais.

orifice, similar to that shown in Fig. 13. The hot plate at the right is simply an ordinary natural gas hot plate with a non-adjustable spud, similar to that shown in Fig. 13.

§2. IMPORTANCE OF VESSEL POSITION.

For cooking operations it is only the tip of the flame that can be used for effective service. If the flame is short and the vessel is so far away that the hot point of the flame does not come close to the vessel, satisfactory results cannot be obtained. If the flame is very long in order to reach the high vessel, the stove will be wasteful in the use of gas.

The following experiment brings out this feature in a rather startling manner. This consisted merely in placing a standard granite-ware vessel containing 7 lbs. of water on top of each of the three stoves as shown, and with .8 oz. pressure, noting the length of time required to bring the water to a vigorous boil, and the gas consumption necessary to accomplish this. The results were as follows:

	Natural Gas Range	*Manufactured Gas Range*	*Hot Plate*
Vessel distance, inches.....	2.1	1.8	1.5
Length of flame, inches....	.6	.6	.3
Cu. ft. of gas.....	6.9	3.6	3.9
Time in minutes.....	47	16	49

In order to bring the vessel to the best operating position for short flames all that is necessary is some device that will hold the vessel the correct distance from the burner. With the drilled type of burner this can be easily accomplished by removing the stove top and inserting three nails or pieces of wire. as shown in Fig. 3, and then placing the vessel on the top of these. With the slotted type of burner, remove the stove top and simply insert three pieces of sheet iron or heavy tin, as shown in Fig. 4, and then place the vessel on the top of these. This is the only change necessary in order to secure satisfactory cooking results with the ordinary stove with low pressures and the resulting short flame lengths.

FIG. 2—PHOTOGRAPH OF APPARATUS USED IN COOKING TESTS.

With low pressures, we found that no perceptible change could be made in the combustion conditions by attempting to adjust the air shutter. That is, entirely satisfactory results were obtained with the air shutter wide open, without any adjustment whatsoever.

§3. EFFICIENCIES AT VARIOUS PRESSURES.

In order to determine the efficiencies of the three stoves at various pressures, a granite-ware kettle—having a diameter of 8½ in. and height of 6 in., and of the form shown in Fig. 2—containing 6 lbs. of water was heated, and the number of cu. ft. of gas required to raise this water to 200 degrees F. was noted. The heating value of the gas was determined

He who bridles the fury of the billows, knows how to put a stop to all the secret plans of the wicked.—Racine.

[illegible] calorimeter and the gas used [illegible] tests [illegible] B. t. u. per cu. ft.

[illegible] the B. t. u. is merely the amount of heat [illegible] to raise one lb. of water one degree [illegible] the number of pounds of water by the total rise [illegible] temperature would give the number of heat units [illegible] delivered to the cooking vessel. This figure [illegible] divided by the number of heat units in the gas [illegible] heating the water will represent the efficiency [illegible] in Sec. [illegible]. The efficiency tests [illegible] the three [illegible]

[illegible]

The [illegible] three stoves at [illegible] pressures [illegible]

COOKING MEAT AT LOW PRESSURES

In this test [illegible] was [illegible] gas pressure [illegible] three [illegible]

[illegible]

[illegible]

[illegible] stoves at the various pre[illegible] and shown [illegible]

BOILING POTATOES AT VARIOUS PRESSURES

In this test two pounds of [illegible] potatoes [illegible] in 6 lbs. of water [illegible] kettle having a diameter [illegible] and of the form shown [illegible] data obtained [illegible] are shown in tabulated [illegible]

FRYING POTATOES AT VARIOUS PRESSURES

[illegible] series of tests [illegible]

What is well done is done soon enough. Du Bartas

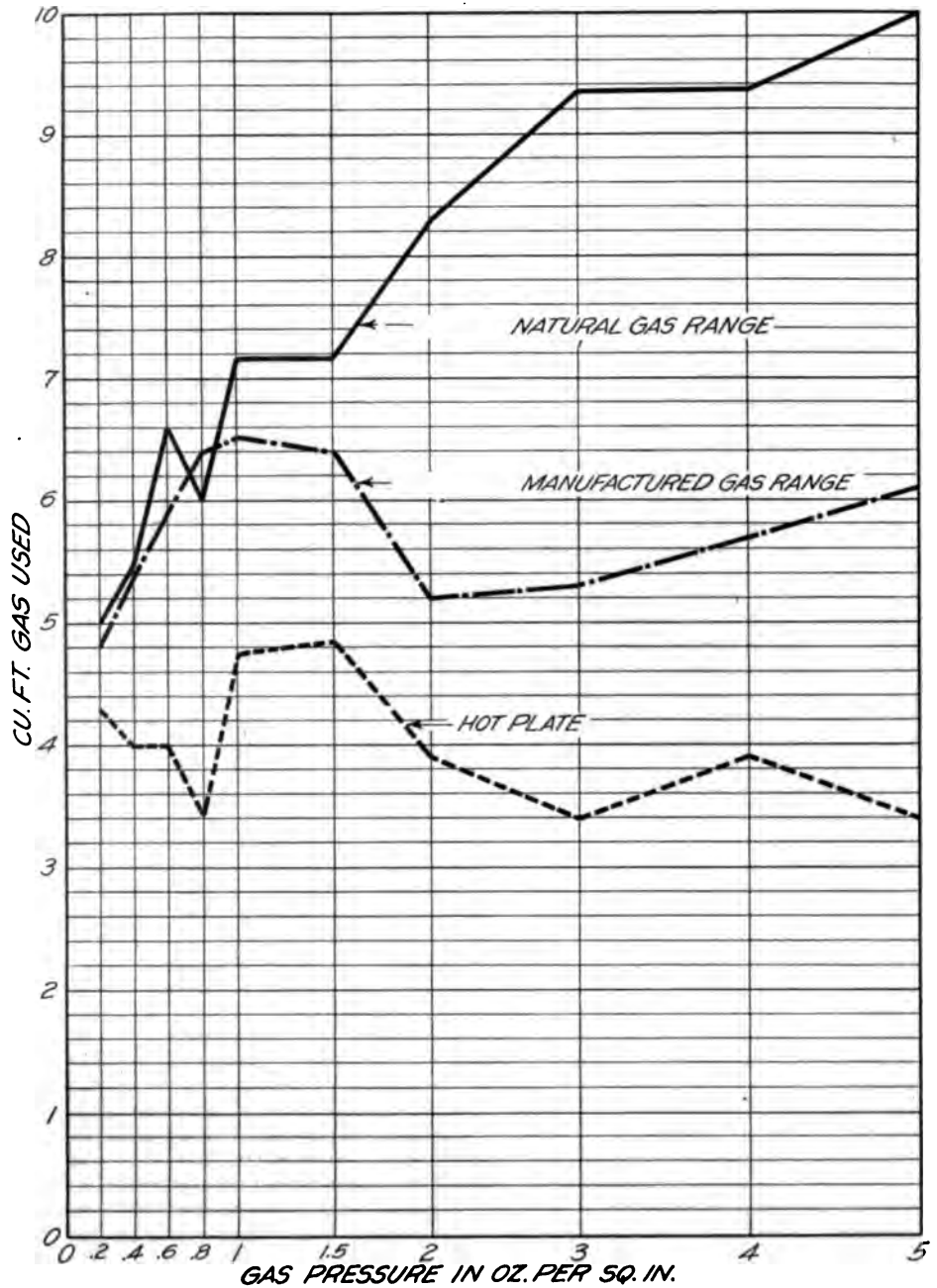


FIG. 5—CURVES SHOWING AMOUNT OF GAS REQUIRED TO BOIL 2 LBS. OF OLD UNPEELED POTATOES ON THREE TYPES OF NATURAL GAS STOVES AT VARIOUS PRESSURES.

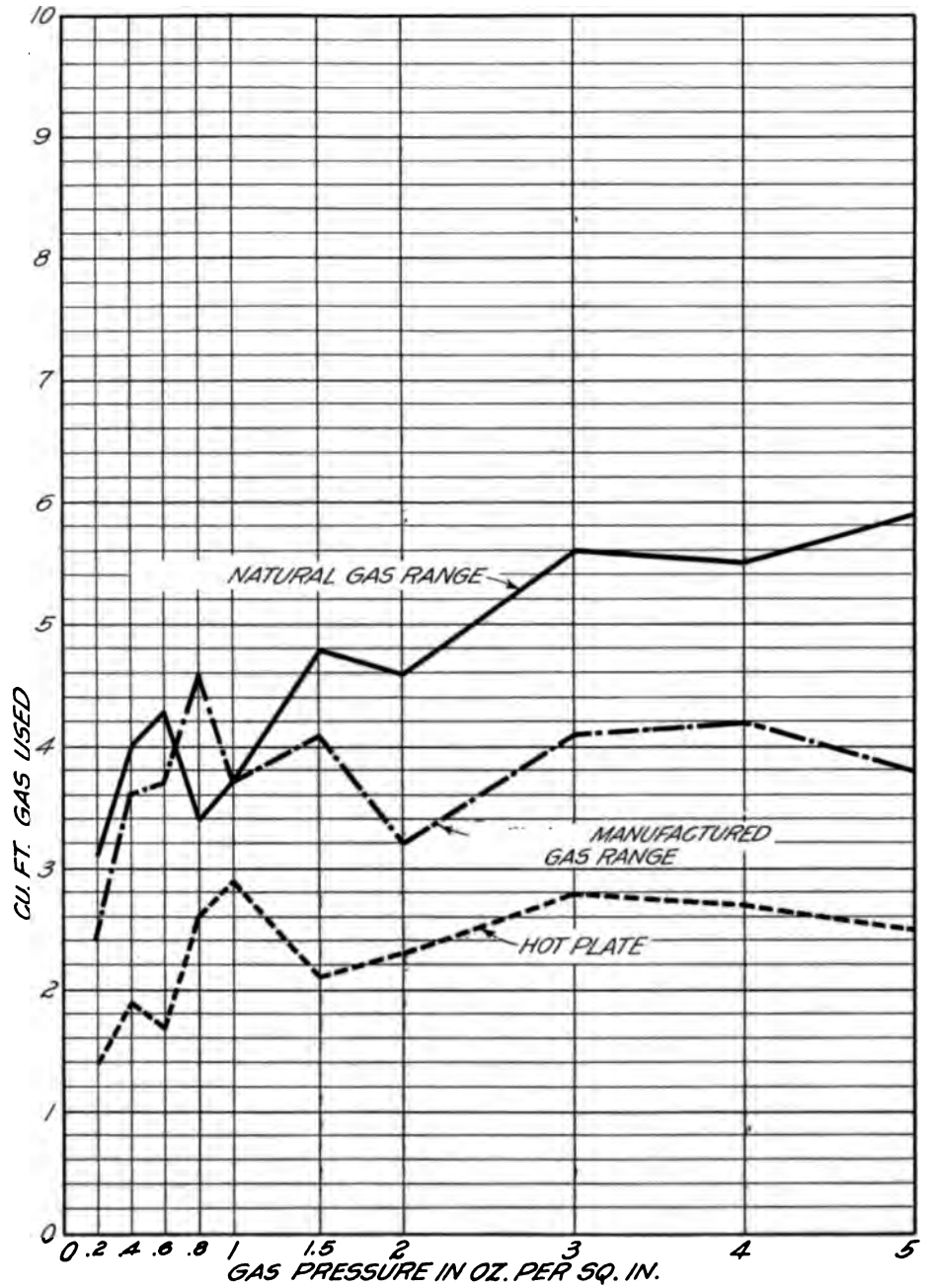
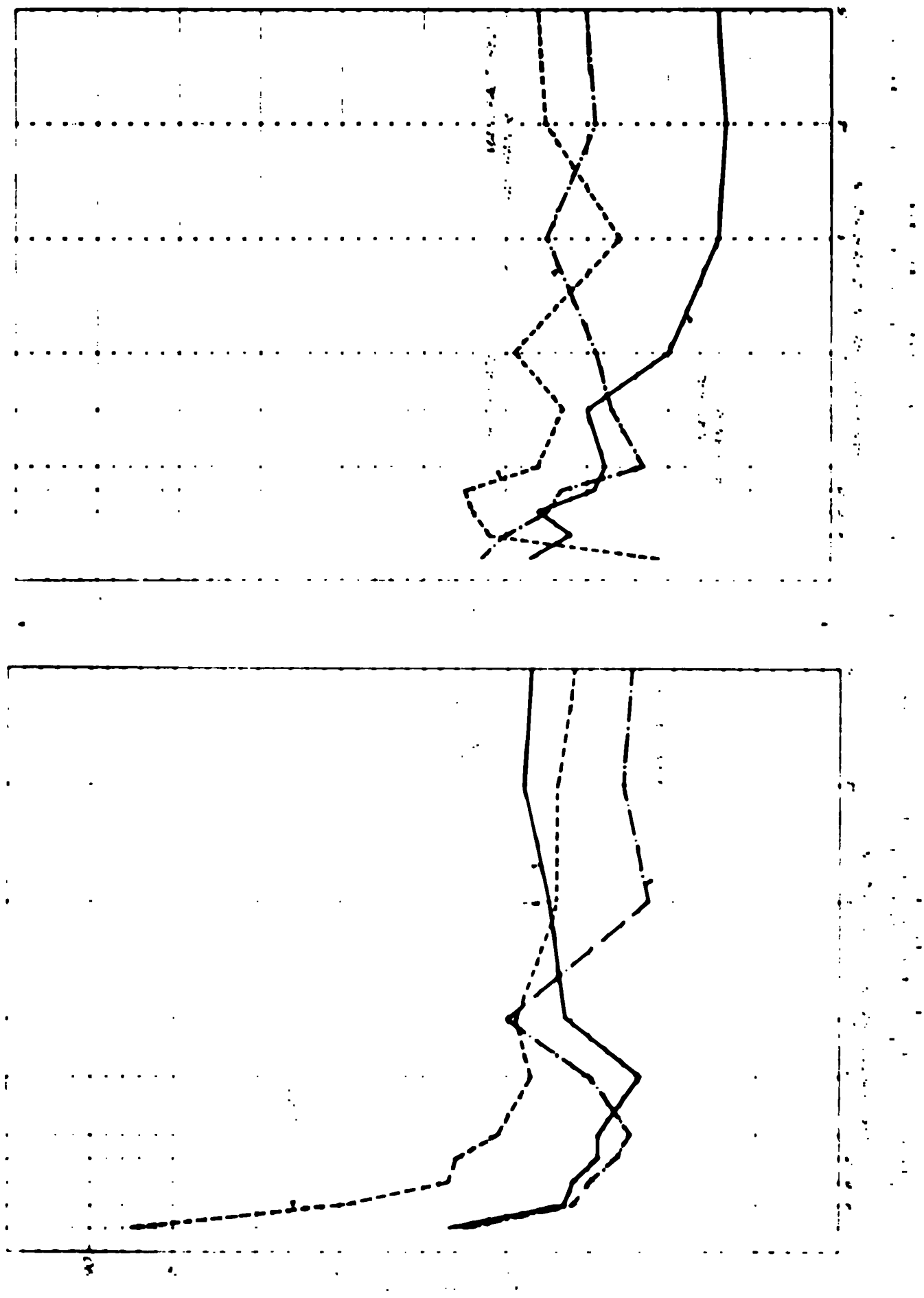


FIG. 6—CURVES SHOWING AMOUNT OF GAS REQUIRED TO FRY 2 LBS. OF OLD RAW THINLY SLICED POTATOES ON THREE TYPES OF NATURAL GAS STOVES AT VARIOUS PRESSURES.



In the following test 1 lb. of thick Porterhouse beefsteak was pan-broiled in an ordinary pressed steel skillet, with a gas pressure of .2 oz. The data obtained for the three stoves were as follows:

PAN-BROILED BEEFSTEAK.

	Nat. Gas Stove	*Manft'd. Gas Stove*	*Hot Plate*
Weight, Porterhouse Steak...	1 lb.	1 lb.	1 lb.
Gas pressure in ounces per sq. in.	.2	.2	.2
Cu. ft. of gas.....	.9	.6	.7
Time in minutes.....	7.	7.	16.
Flame length in inches.....	.2	.3	.2
Skillet distance, inches.....	.6	.6	.3
Barometric pressure in inches mercury 29.18	29.18	29.18	

makes no appreciable difference in the registration of the meter, the meter merely registering—within a reasonable limit of tolerance*—the amount of gas that passes, and this is neither increased nor decreased by changes in pressure.**

A No. 1 Iron Clad, Pittsburgh Meter Co., Dry Meter, No. 298598, was used for measuring the gas in these tests. This was proved for accuracy before the tests were started. The meter had been in use for about two years prior to the tests and was in no way specially prepared by adjustment or lubrication for this work, other than merely to check its accuracy against a certified meter power.

After the cooking tests were completed the meter prover used for adjusting the pressures—shown in Fig. 2—was filled with natural gas which was then allowed to stand for several hours, until it acquired the room temperature. The gas from this meter prover was then passed through this meter at various pressures, through the middle burner—having a No. 47 spud opening—of the manufactured gas range, giving the following results:

Pressure in oz. per sq. inch	*No. minutes to pass 1 cu. ft. by meter*	*Cu. ft. gas by meter*	*Cu. ft. gas by meter prover*	*Per cent. Error of meter*
.2	10.5	1	1.01	1% slow
.4	6.3	1	1.01	1% slow
.6	5.4	1	.99	1% fast
.8	5.0	1	.98	2% fast
1.0	4.0	1	1.01	1% slow
1.5	3.2	1	1.00	0
2.0	2.5	1	.99	1% fast
3.0	2.0	1	1.01	1% slow
4.0	1.8	1	1.00	0
5.0	1.5	1	1.01	1% slow

*The Ohio Laws fix the limit of tolerance at 3 per cent. fast or 3 per cent. slow for gas meters. That is, a meter that is within not to exceed 3 per cent. fast or 3 per cent. slow is regarded as commercially accurate.

**The same conclusion was reached in a report published by the Kansas Public Utilities Commission, as Engineering Bulletin No. 2, of the University of Kansas, on "Natural Gas: Its Properties, Its Domestic Use, and Its Measurement by Meters," under date of July 1, 1912.

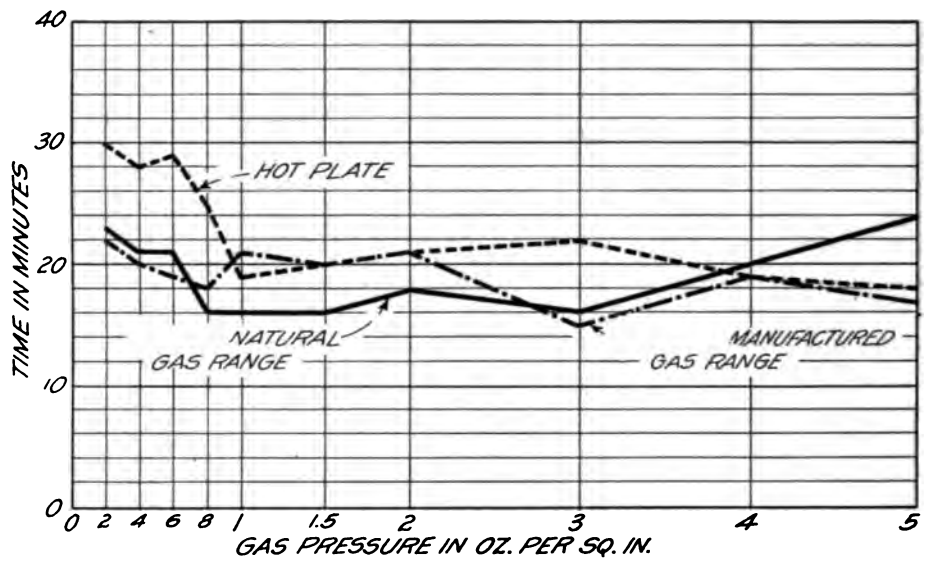


FIG. 8—CURVES SHOWING VARIATION REQUIRED TO FRY 2 LBS. OF OLD RAW THINLY SLICED POTATOES ON THREE TYPES OF NATURAL GAS STOVES AT VARIOUS PRESSURES.

§7. BAKING TESTS AT LOW PRESSURES.

In baking 1 lb. loaves of white bread made up of two-thirds wheat and one-third barley flour, at .5 oz. and 4 oz. pressures, the following results were obtained in the bakers of the natural gas and manufactured gas ranges:

.5 oz. Pressure—	*Nat. Gas Range*		*Mftd. Gas Range*	
	Time in min.	*Cu. ft. Gas*	*Time in min.*	*Cu. ft. Gas*
Heating oven ready to receive bread	26	7.5	16	3.2
Baking bread	32	3.25	33	6
Totals	58	10.75	49	9.2
4 oz. Pressure—				
Heating oven ready to receive bread	14	6	7	2.2
Baking bread	32	4.2	32	7.2
Totals	46	10.2	39	9.4

§8. ACCURACY OF METER REGISTRATION AT LOW AND VARIOUS GAS PRESSURES.

The popular belief is that meters run faster when the pressure is low than when the pressure is high. This is contrary to the facts. Variation in pressure

—Section 11. of this report will appear in the October number of this magazine.

So much is a man worth as he esteems himself.—Rabelais.

The Chemical Aspect

"The Chemical Possibilities of Natural Gas" — A Paper Discussing a Very Important Phase of the Industry.

BY DR. T. B. GARNER.

IT is only in the past few years that producers of natural gas have given any attention to methods of utilization of it other than as fuel and illuminant. During the early history of the natural gas industry the supply greatly exceeded the demand—there was so much natural gas that there was no occasion for anyone to try to think of economizing in its use or of recovering from it valuable by-products. In fact the early years of this industry were years of great waste. In localities where there was an abundance of gas, as in the Indiana field, factories were encouraged by local boards of trade to locate in the field; free sites and free gas were bestowed indiscriminately. The only returns which were expected from the wasteful use of gas by these factories was the industrial uplift which would occur to the community. Land speculators were eager for profit at any price. The natural gas industry has long been recognized as an important factor in the industrial development of the United States.

The general public is not responsible for this condition of affairs as it has been interested only in securing a priceless clean fuel at a ridiculously low figure. Producers likewise have been so interested in getting rid of their gas that they have sold it for the manufacture of carbon black by the wasteful process of incomplete combustion. Their efforts have been directed toward the sale of gas as a fuel and not to its utilization for chemical processes.

All of these conditions have been largely due to the enormous amount of natural gas. Producers have had no incentive to investigate the chemical possibilities of their product. It is only in the past decade that the more enterprising producers have interested themselves in the situation and have engaged scientific and technical men to undertake the study of these problems. The motto heretofore has been "let well enough alone." The fact that natural gas is a product whose chief use and value has been as a fuel has tended to obscure the fact that it is also a product of great chemical possibilities. The natural gas industry furnishes many promising lines of research. In reading over the proceedings of the Natural Gas Association of America the writer finds reference to the remarks of altruistic persons who have endeavored to interest gas producers in research.

The first question always asked of these altruistic persons is what will be the profit, not what are the possibilities. The appeals for scientific research on the possibilities of natural gas have for the most part been met with rebuff. Although the response on the part of the producers to the appeals of the scientific and technical men has been a long time in coming, it is quite clear to even the most casual observer that while the natural gas industry is today responsive to the problem of the chemical possibilities of natural gas.

In the early development of the natural gas industry little thought was given to faulty valves, gates, couplingss, regulators and other appliances connected with the drilling, production, transmission and distribution of natural gas. A goodly proportion of the gas that was produced was lost for the reasons that the appliances used were faulty. These were at once obvious and apparent. The producer could easily see his potential profits dissipated into the air and as the result of the situation, he was forced to go to the engineer to devise for him new and less wasteful methods of handling his gas. The value of the results of the work of the engineer along these lines was at once recognized because of the increased balance on the right side of the ledger. The producer was convinced that the engineer was a necessary adjunct to his business. Later on when well pressures declined and it became necessary to install large compressing stations, gas cooling coils, etc., the need of the engineer became more and more apparent, because of the numerous mechanical and electrical problems which arose from the successful operation and maintenance of gas compressing stations. The most enterprising of these companies secured the services of highly trained as well as intensely practical, scientific and technical men. There is no country on the face of the earth which is so highly specialized in the compression and transmission of high pressure gas.

Simultaneously with the installation of machinery for the artificial compression of natural gas in order that it might be economically transported to market, there was a decided lowering of the pressure on the well Perhaps as a consequence of the lowering of the well pressure it has since been discovered that some less volatile gas was obtained and by the process of compression and the consequent cooling of the gas minor quantities of these less volatile hydrocarbons were sometimes deposited as liquid in the transportation lines. This usually took place in cold weather, and occasionally this liquid would collect at a low point in the line in association with quantities of water and would interefere with the transportation of the gas. At low temperatures the water would freeze and the result would be the bursting of the pipe line. Not only were large quantities of gas lost when this hap-

—Natural Gas Association of America Convention.

It matters not what you are thought to be, but what you are.—Syrus.

pened, but the service to the customers who needed the gas was interefered with at a particularly inopportune time. The deposit of these liquid hydrocarbons also sometimes injured the rubbers of the couplings to such an extent as to render it a nuisance to the producer. The producer therefore again consulted the engineer, and drips were devised in which the liquid deposited in the pipe line could be periodically removed without interfering with the transmission of the gas. The liquid hydrocarbons thus collected when separated from the water came to be known as drip gasoline. It was not obtained in quantities sufficient to render it an article of commerce, though quantities of it were sometimes sold to refineries.

At about this time an enterprising and far-seeing chemical engineer, George M. Saybolt, conceived the idea, contrary to the general notion, that there might be enough of the heavier hydrocarbons existing in the form of vapor in natural gas to justify an effort for their commercial extraction in liquid form. Starting with this idea Mr. Saybolt invented a method of extracting these vapors and engaged in a series of experiments under the auspices of a large natural gas producing company which interested itself in his work. The result of Mr. Saybolt's experiments was the conviction not only that gasoline could be extracted from natural gas, but the process which he had invented was a highly successful one for that purpose. The first plant for obtaining gasoline by his method was installed and placed in operation in August 1913, and soon another surprising fact was learned, namely, that the gasoline so obtained was one of a particularly high quality and different from any other then on the market.

You are all conversant with the growth and development of this remarkable natural gas gasoline industry. It is now perfectly apparent to any one connected with the natural gas industry that gasoline can be extracted in commercial quantities from natural gas and that adequate returns are to be had from the investment required. Ten years ago, however, the story was different. All of this progress, development and growth in this industry we owe to the pioneer efforts of the chemical engineer—George M Saybolt.

Composition of Natural Gas.

Natural gas is composed almost entirely of paraffin hydrocarbons in varying proportions,—methane, ethane, propane, butane, pentane, hexane, heptane and octane. Nitrogen, carbon dioxide, and helium may exist in small quantities. The first two of the hydrocarbons are fixed gases, that is, gases which liquefy only at very low temperatures and high pressures. Propane and butane are normally regarded as gases but are intermediate in their properties between a true gas on the one hand and a true liquid on the other hand. Pentane, hexane, heptane, and octane are normally liquids at atmospheric temperature and pressure. Most commonly methane is the predominating constituent and octane is the hydrocarbon which occurs to the least extent in natural gas.

These compounds are called "Paraffin Hydrocarbons" because they are thought to be compounds which show little or no chemical reactivity. This means in other words that they are substances which, when subjected to forces that bring about chemical change, undergo this change only with the greatest difficulty, or only when in contact with the most energetic chemical reagents.

Chemical change refers to any change in a substance which affects its composition, or, to put it in other words when a substance undergoes chemical change the identity of the substance is lost. For example,—when natural gas is burned in air both the air and the natural gas undergo chemical change, since the product resulting from the burning of the natural gas in the air is entirely different from either natural gas or air. The products of this chemical change are carbon dioxide, water and nitrogen. The product is no longer valuable as fuel or illuminant, or capable of sustaining animal life. A definite and fixed quantity by weight of both natural gas and air have been required to bring about, under a certain set of conditions of temperature and pressure, this chemical change. This explanation is offered, so that a clear understanding may be had of that which constitutes chemical change.

Chemical changes in general are effected in two ways:—

First: The substance which is to be studied chemically is subjected, in the absence of all other substances, to some form of energy, as light, heat or electricity.

Second: The substance which is to be subjected to chemical change is placed in contact with a definite weight of another substance, and the mixture subjected to some form of energy in the presence or absence of small quantities of a foreign material known as a catalyst. Catalysts have for their purpose the hastening or retarding of the final state of the change.

The first of these methods of effecting chemical change is illustrated by the following two well known reactions:

First: When ordinary sugar is heated, the final results of the heating are carbon and water.

Second: When high boiling petroleum distillates are heated under pressure at temperatures from 500 to 550 degress C., "cracked" gasoline is produced, while if the temperature is from 650 to 750 degrees C., aromatic hydrocarbons such as benzol and toluol are produced. In order to understand the chemical changes which have occurred by the simple heating of these substances, it may be well for us to visualize all substances as being of a grained structure, and that the grains composing the structure are held together by a pull force, i. e., a force which tends to keep the particles or grains together. The pull force which holds together the atoms of hydrogen and carbon making up the substances we know as methane, ethane, propane, etc., is called chemical force or chemical affinity. So long as this pull force is in excess of any external force tending to separate the atoms from one another or push them apart or rearrange them, the substance does not undergo any chemical change, but when that situation is reached where the external energy is stronger or greater than the energy which holds the particles together, chemical change results. Thus, when a substance is heated, energy in the form of a separating

force is being added to the substance. The addition of this energy to the substance intensifies the motion of the particles making up the substance, and thereby lessens the chemical affinity which holds them together. If the rapidity of motion of the atoms composing the substance becomes so great that the particles no longer can hang together due to the action of chemical affinity, a chemical change takes place; or in other words, chemical affinity ceases to act when the atomic vibrations reach a certain limiting value.

The second of these methods of effecting chemical change is illustrated by the following series of experiments which will be performed here at the table. I have here what is known in chemical laboratories as a Kipp apparatus. This apparatus contains in the middle portion some ordinary granulated zinc. The upper and lower portions contain dilute Sulphuric Acid. When the zinc and sulphuric acid are brought into contact by manipulation of the stopcock from the middle portion, hydrogen is produced, and escapes through the opening in the stopcock. Attached to this stopcock is a piece of rubber hose, terminating in a small piece of glass tubing drawn to a capillary. You will observe that upon opening the stopcock, hydrogen gas escapes into the air, and that this escape occasions nothing more than the admixture of hydrogen with the air—a change similar to that which would occur when a valve on a gas line is opened. I have here a piece of iron wire which I heat to several temperatures, so that I may expose the stream of hydrogen gas as it mixes with air to different degrees of heat, the purpose being to show that this mixture of hydrogen will burn and thus undergo a chemical change. You will observe that when the iron wire is heated to a slight extent, the hydrogen does not burn, but when the wire is heated to redness, burning results. The exact temperature at which hydrogen in the presence of air begins to burn is 700 degrees C. By this experiment, I have shown that hydrogen, when mixed in air requires the addition of a certain amount of energy to cause these two substances to undergo chemical change at a noticeable rate. Energy in the form of electricity might have been added here with similar results.

In order that you may have some tangible and definite idea of what a catalyst is, I have prepared some platinum black, and have it here in this bottle. This platinum black has been prepared by taking some asbestos fibre, moistening it with a solution of platinum chloride, and then heating the mixture red hot. This sample of platinum black is nothing more or less than asbestos covered with finely divided metallic platinum. Platinum black is a catalyst widely used commercially. You will notice that this platinum black is cold. I will now introduce it into this stream of hydrogen, and you will observe the effect of this catalyst upon the mixture of hydrogen and air. The hydrogen bursts immediately into flame, and the results are the same as when the hydrogen was heated to a definite temperature by means of the iron wire. I do not know why or how platinum black causes this chemical change to take place, but you know that it does take place very readily and at much lower temperature than we had.

So much then for the above general presentation of the chemical characteristics of the constituents of natural gas, what chemical change is, and how chemical changes may be induced or caused to take place. We are now in a position to begin our study of the chemical possibilities of natural gas.

In order that this subject may be simplified and at the same time made more intelligible, I desire to direct your attention, in the first place, to the processes which have for their purpose the separation of natural gas into its constituents; in the second place, to the chemical changes which natural gas as a mixture, or its constituents separately, will undergo when subjected to heat under varying conditions; and in the third place, to the change which the constituents of natural gas will undergo when subjected to chemical change in the presence of other substances with and without catalysts; and in the fourth place, to the valuable by-products which may be obtained by synthetic chemical reactions from the exhaust gas of gas engines.

Since August 1913 when the Hope Natural Gas Company installed the first absorption gasoline plant for the recovery of gasoline from natural gas, the natural gas-gasoline industry has experienced a rapid and remarkable growth. There are in existence at the present time more than 100 plants in the United States with a conservatively estimated production for the year in 1918 of more than 90,000,000 gallons. The extraction of gasoline by this method has in no way affected the value of natural gas as a fuel. It has made the production of natural gas more profitable; it has made the service to consumers more efficient, less interrupted, and more satisfactory. It has been one of the most important factors devised or invented having to do with the conservation of our natural gas resources. Probably no other factor has been so noteworthy in this direction. It has not only utilized and saved that which was formerly wasted, but it has enabled producers of motor fuel to meet the demands of the market for this material in a manner which would have been exceedingly difficult if at all possible in the present status of the oil industry. Petroleum distillates which of themselves are not utilizable as motor fuels are, when blended with natural gas-gasoline converted into satisfactory motor fuels. From the nature of the occurrence of gasoline as vapor in natural gas, one can readily understand why natural gas-gasoline contains relatively far more of the lower boiling hydrocarbons, pentane and hexane, than is contained in refinery gasoline. It is the relatively large proportion of these two hydrocarbons that gives to natural gas-gasoline its greater value, and that has to the present time made it an article of great chemical importance.

At the outbreak of the present great World War, unusual chemical demands were made of American industry. One of the foremost of these demands was for explosives or munitions. A chemical compound known as amyl acetate is extensively used in the explosive industries. Prior to the war, Germany furnished practically all the world's supply of this material. All that was made in America was made from amyl alcohol and acetic acid. A review of the patent literature discloses

that there were numerous German patents by means of which this product could be prepared from pentane. American manufacturers facing the shortage of material, and knowing that the requirements would be great, went into the gasoline market, and asked that special cuts be made so that they would be provided with sufficient pentane which they could utilize for the manufacture of this product. On account of the fact that the Unied States Government has been lax regarding exact disclosures in the patents granted, especially to Germans, it was necessary that American industry should employ skilled and competent chemists to endeavor to find a method by means of which amyl acetate could be manufactured at a reasonable cost and in sufficient quantities to meet present day requirements. The work required of American chemists was rendered more difficult on account of the confusion which arose over incorrect disclosures in the patents already granted than if there had been no published data regarding any process whatsoever. The whole ground had to be worked over thoroughly and carefully. As a result of the work of these chemists a process was invented, a plant was installed, and quantities of material adequate for all present-day demands produced. The DuPonts at Wilmington, Delaware, have had in operation for two years a plant for this purpose. The process consists essentially of taking natural gas-gasoline and subjecting it to fractional distillation. The fraction which distills over at from 40 to 70° C. and which is essentially a solution of pentane and hexane, is brought in contact with Chlorine in the presence of ultra violet rays of light, until a certain amount of Chlorine has been absorbed by this fraction. This chlorinated mixture is then subjected to a washing and distilling operation. In the distilling operation, a fraction is selected, whose chief constituent is amyl chloride, or pentane in which one Hydrogen atom has been displaced by one Chlorine atom. This amyl chloride is then mixed with sodium acetate and the mixture heated under pressure. Common salt and amyl acetate are the products of the change which occurs. The separation of these two compounds is readily and easily effected. Amyl acetate has the following commercial uses,—solvent for pyrocollodion, collodion, plotocotton and pyroxylene. Pyroxylene is used in the manufacture of artificial silk, imitation leather, waterproofing compositions, celluloid, and photographic films. Proxylene lacquers and amyl acetate are used for metallic surface coverings.

It appears to the speaker that the chemical possibilities of hexane, heptane and octane are even greater commercially than those of pentane. One of the greatest of the demands made upon American industry and in fact upon world industry since the beginning of this great war is that of fatty acids, i. e., acids which are derived by chemical changes more or less from vegetable and animal tissues. The supply from living sources has not been equal to the demand, and industry, in order to meet the pressing requirements, has been compelled to look to mineral sources as a base of supply. Upon high authority the statement has been recently made,—"It is not improbable that Germany to-day is supplying a large part of her fats from synthetic production, with mineral oils as a base of supply." It would be entirely foreign to a meeting of this general nature to enter into a detail discussion of the changes which would be involved in the obtaining of fatty acids from these hydrocarbons of natural gas-gasoline, but it is not a dream or a product of the imagination when I state that it is entirely feasible by well known and well tested chemical reactions and methods of synthesis to prepare a fatty acid from these hydrocarbons that will have the same composition, same food value and same uses as the corresponding acid derived from natural fats. Numerous instances can be cited from scientific literature which will convince anyone of the correctness of this statement. To have made the statement ten years ago that gasoline was a potential force in supplying a part of the food requirements of the nation would have been regarded as fanatical and impossible. (Those who are especially interested in these chemical possibilities of the hydrocarbons of natural gas-gasoline are respectfully referred to a very complete and comprehensive article on the subject contained in a journal called "Metallurgical and Chemical Engineering" of March 15, 1918, pages 308 to 311.)

Within the past year, many of the newspapers and most of the popular magazines have contained articles descriptive of the recovery from coal and coke oven gas of benzol and toluol, and the manufacture from these substances of high explosives, important drugs and medicines and widely used coal tar dyes. These articles have appeared as a result of a desire on the part of the American people to learn of the demands which are being made upon American industry by the nations at war. Germany had formerly supplied practically the entire world with these substances, and when the German supply had been cut off, such a demand had been created that it was necessary that some nation not at war provide ways and means of meeting these requirements. Plants for the recovery of benzol and toluol from coke oven gas have been installed throughout this country with such remarkable rapidity and on such a colossal scale that American industry can today, if called upon, furnish the entire requirements of these materials for the world on a war basis. The scientific investigation which preceded and has gone along with the development of this great American industry, shows clearly some additional chemical possibilities which natural gas-gasoline may have. The mother substance of all the so-called coal-tar drugs, medicines, explosives and dyes is benzol. Benzol does not exist as such in coal from which coal or coke oven gas is derived, but is formed by the chemical change which occurs under definite conditions when the coal is heated. It has been conclusively shown by a large number of chemists that when coal is caused to undergo chemical change at low temperatures, benzol or aromatic hydrocarbons are formed. I have mentioned previously in this address that highboiling paraffin petroleum distillates when heated to 500 to 550° C. gave what is called "cracked" gasoline, and when heated to 650 to 750° C. gave aromatic compounds. The speaker has personally conducted experiments with propane and butane and the gasoline hydrocarbons under varying conditions of tem-

While we stop to think, we often miss our opportunity.—Syrus.

perature in the presence of catalysts like nickel and iron, and found that benzol and toluol can be prepared from them. It seems therefore quite clear that if the proper time, attention and thought were put upon the problem, that a commercial process, economical and satisfactory, could be devised, whereby the hydrocarbons composing natural gas could be converted into benzol and toluol, or in other words, if necessity required natural gas-gasoline could be made the basis of the coal tar, drug, medicine, explosive, and dye industries.

It has long been noticed in the operation of absorption gasoline plants that there were heavy hydrocarbon vapors that were not condensed at atmospheric pressure by the condenser directly connected to the stills in the distilling operation. Early in the industry, these vapors were permitted to escape, either into the air, or were passed into a low pressure fuel line. Later on, these vapors were collected and handled in a small compressor, and as a result of the compression and subsequent cooling, considerable yields of high gravity gasoline were secured. This practice is now a general one in absorption gasoline plants. The uncondensed gases from this tail house compressor have for the most part been either put into suction lines or into fuel lines. In some few instances, the compressor which is used on these vapors is a two-stage one, in which pressures of from 100 to 150 pounds are maintained on the discharge. When such compressors are used, the product produced in the second stage of the compression, or in the low stage if the pressure is above 50 pounds, contains highly volatile liquid. If the liquid produced under such circumstances is trapped or blown off into run or storage tanks, the product undergoes weathering, which means nothing more or less than that the material is permitted to remain in the tanks until the highly volatile portion has evaporated. In the majority of these cases, the weathering or evaporation products are permitted to escape into the air. This practice has been nothing more or less than criminal waste, for every producer of natural gas-gasoline has known that under no circumstances can this material be delivered to market in ordinary tank cars, and that although he has spent his money for equipment and power in producing it, he has received no financial return from it. It seems incredible that the commercial possibilities of extracting liquid by-products should have been unnoticed for so long a time

As the natural gas-gasoline industry developed and its possibilities become well known, leaders in the natural gas industry, as a result of their studies in determining the best conditions of operation of gasoline plants, realized that there could be extracted from natural gas other by-products of a liquid nature, which were too highly volatile for use and shipment as gasoline. Recent discoveries have disclosed the utility and value of the propane and butane constituents of natural gas when they are substantially free from other constituents of the gas. A process has been devised for the recovery of these two substances in liquid form along with the recovery of gasoline from natural gas. The plant which will produce these two substances is made as an adjunct to the absorption gasoline plant. It can be easily and cheaply installed, and can be operated with very low operating cost as the operating conditions require no additional attention other than that which the men regularly employed on a gasoline plant can give to it without neglecting their other duties. One plant has already been installed for the manufacture of both liquid butane and propane. Since May 31, 1917, it has been possible to produce at this plant approximately 2,200 gallons of liquid butane and 2,000 gallons of liquid propane, per day.

In practicing the process for the recovery of substantially pure liquid butane and liquid propane, the by-product vapors from the condenser consisting of a mixture of propane, butane, some pentane, hexane and fixed gases are passed under pressure under a definite set of conditions through an absorbent oil. This treatment is for the purpose of removing petane and hexane. The remaining vapors—substantially a mixture of propane and butane, are, under a given set of temperature conditions, subjected to pressure. This results in the condensation of a highly-volatile liquid product from which liquid butane is commercially produced. The remaining uncondensed propane vapor is again subjected to a compressing and cooling operation, and a liquid portion is obtained, from which substantially pure liquid propane is obtained. The products as obtained by the process thus briefly rescribed have the following average physical properties,—

Liquid Butane is a clear, colorless, mobile liquid with a gravity of 106 to 108° B. at 32° F.; it has a heating value of about 3,400 b. t. u. per cubic foot. One gallon of the product when evaporated, produces 37 cu. ft. of vapor when measured at 60° F. and atmospheric pressure. The gravity of the gas or vapor produced varies from 1.98 to 2.02, air equalling one (1). The boiling point of the liquid at atmospheric pressure varies from approximately 29° F. to 34° F. The following temperature-pressure relations, when this product was confined in a steel cylinder were found,—

Degrees F.	*Pressure Gauge.*
44	55
60	65
71	83
81	98
92	112
103	129

Latent heat of evaporation at one atmosphere and 32° F. — 164 b. t. u. per pound.

Liquid Propane is a clear, colorless mobile liquid, gravity 128 to 131° B. at 32° F. Heat value, 2,600 b. t. u. per cubic foot. One gallon of the product upon evaporation will yield 45 cu. ft. of gas or vapor at 60° F. and atmospheric pressure. The gravity of the gas produced is 1.51 to 1.54. The boiling point of the liquid at atmospheric pressure is approximately 49° F. The following temperature-pressure relations, when this product was confined in a steel cylinder, were found,—

It is a very hard undertaking to see to please everybody.—Syrus.

Degrees F.	*Pressure Gauge.*
47	438
59	453
70	470
81	500
91	524
100	555

Numerous practical and engineering tests have been made on both of these products. They have been found suitable for the lighting and heating of homes and buildings in regions remote from the gas fields. The ordinary commercial appliances in the way of burners and stoves have been used in these experiments. The re-adjustments which have been required in these common devices for the economical and satisfactory use of those products have been learned. Tests have been made with those gases as a source of power for stationary engines and automobiles. In the work of adapting these products for motor fuel purposes, the speaker has had the hearty co-operation of Drs. Raymond F. Bacon and Harry Essex of the Mellon Institute, and Mr. Barber, an experienced internal combustion engineer. The results of the work carried on clearly indicate and prove that not only can those substances be used with the ordinary equipment of internal combustion engines, but that the carburetor can be entirely done away with, and in its stead a gas mixer be used. The followig road and maximum power tests will be of considerable interest:

RECORD OF ROAD TEST USING BUTANE AS FUEL
JULY 9-10, 1917.

Machine .....Crawford 45 h.p. using gas mixer in place of carburetor.
Weight .....Empty 3,750 pounds; loaded 4,750 pounds.
Run consisted of...21 miles Pittsburgh city driving, 111 miles country-mountain driving.
Location of run....From Pittsburgh to the east side of Laurel Ridge (beyond Ligonier, Pa.) and return.
Gas supply .....In three (3) cylinders, containing 78 pounds of Butane.
Total gas used.....58 pounds.
Total Mileage .....133 miles.
Miles per pound...2.3 miles.
Miles per gallon..... 11.5 miles.
Adjustments made ..... 70.
Connections made ..... 21.
Stops to change tanks, etc. 40.

Note.—Each stop necessitated readjustment and a large loss of gas—unnecessary with proper tanks and purest gas.

COMPARISON WITH GASOLINE.

The same Crawford car, equipped with Stromberg carburettor on the same run with three stops gives 9.3 miles per gallon of 76° gasoline.

With forty stops, and the same number of adjustments, the mileage would be less than five miles per gallon of gasoline.

In addition to this excellent mileage shown, the oil requirement was cut over 50 per cent. But one quart of oil was put into the system and not over three-quarters quart used. Ordinarily with gasoline on this run, two quarts are necessary.

REMARKS.

The run as recorded above was made on a very bad day. Rain fell hard for at least four of the ten hours' time and the air temperature was from 52° to 60°, giving little chance for gasification by heat; also the roads were necessarily slippery.

The engine at no time failed to give the proper mixture and could be throttled down to five miles per hour on a 12 per cent grade without stalling or missing a single explosion. This cannot be done with any four cylinder car using gasoline.

In the maximum power tests which were conducted at the Mellon Institute, a Dodge Motor was used. Various fuels were tested, and the total horse power developed by all the fuels used did not vary from one another more than one percent, or easily within the limits of experimental error. Carburetor adjusted and spark advanced to maximum power. The temperature of the exhaust gases varied from 640 as a minimum to 655° C. as the maximum.

In our work with the stationary engines, we have found that one cubic foot of propane is equivalent to almost two and one-quarter feet of ordinary natural gas, and that one cubic foot of butane is equivalent to approximately three cubic feet of ordinary natural gas. This is the relationship which could have been anticipated from the relative heating values of the different products. In addition to the uses cited above for these by-product liquids, other important uses have been discovered and appliances for their satisfactory use commercially devised—namely, for the purpose of the cutting of metals and of incendiary bombs for offensive warfare work. The latter one of these uses will be omitted from the discussion of this paper for obvious reasons. The form of these uses will be demonstrated to you. (Demonstrated.) The credit for working out the details of the torch used for metal cutting is due to James and Harry Anderson of the N. C. Davisson Burner Company. Liquid butane and liquid propane have both been successfully used by these same gentlemen for the welding of cast iron, aluminum and other metals. Work is in progress which has for its purpose the development of a torch, which will enable these materials to be used for steel welding. The speaker has every reason to believe that this torch will soon be available for sale on the American market. In accordance with the Interstate Commerce Commission specifications No. 6 for shipment of liquefied gas of not over 150 lbs. charging pressures, cylinders may be used which are seamless, or of welded or brazed construction, and must show a test pressure of 600 lbs. Butane does not require 150 lbs. charging pressure. It is therefore possible to ship liquid butane in accordance with these specifications in cylinders which will weigh from one-eighth to one-third that of the cylinders now used in interstate commerce shipments, of gases which are used for similar purposes. This gives butane a marked advantage in freight and express shipments. In addition, the cost of these cylinders should not be in excess of forty per cent. of the other cylinders which are in use commercially.

He who can take advice is sometimes superior to him who gives it.—Von Knebel.

Another added advantage in the use of butane is its markably narrow explosive range. The following may of interest with reference to the explosive limits for xtures of various commercial gases,—

Natural gas	5 to 11¼% of gas.
Methane	6.1 to 12.8.
Coal gas	7.9 to 19.1.
Acetylene	3.3 to 52.3.
Hydrogen	9.45 to 66.4.
Butane	3 to 8.

is clear from the above that butane is the safest to e of all commercial gases.

It is apparent from the above program that there are enormous possibilities from the recovery and therefore e use of these liquids, highly volatile products of nat-

finely divided copper, finely divided iron, aluminum chloride, and silica. It was found that the decomposition, whatever took place in the presence of these catalysts varied in a manner that was characteristic for each catalyst. For example, one catalyst, under a definite set of conditions, gave a high percentage of acetylene while another produced none.

There has been quite a lot of work done on the thermal decomposition of the paraffin hydrocarbons but as far as the speaker is concerned he is not aware of the industrial application of the results of the majority of this work. The patent, scientific, and technical literature contains much information relative to the subject.

In the experimental work which the speaker did the following products were used:

al gas. A discussion of other possibilities of these bstances is deferred to another section of the address.

EMICAL CHANGES WHICH NATURAL GAS, AS A MIXTURE, OR ITS CONSTITUENTS SEPARATELY WILL UNDERGO WHEN SUBJECTED TO HEAT.

Early in October of 1915 the speaker, in connection th his assistants, began a preliminary study of the effect heat on natural gas.

They made use of electrically heated fused Quartz or lly steel tubes. Experiments were made both in the sence and absence of catalysts and the influence of se substances on the decomposition under temperature ges of from 400° C. to 1400° C. studied. The catsts used were pumice-nickel, pumice-copper, charcoal,

(a) Natural gas as is delivered to the City of Pittsburgh; (b) vent tank gas; (c) propane; and (d) butane.

All of the samples of these gases were carefully analyzed and tested and their properties tabulated. The gases were then caused to pass through the apparatus provided for their study under varying conditions of temperature, pressure and rate. A photo of the apparatus is given below.

From the photograph it will be observed that the apparatus consists of the following parts:

(a) A steel cylinder in which the gas to be studied is confined.

(b) Wash bottles which contain a liquid to indicate the rate at which the gas is passing.

(c) An apparatus which determines the exact amount of gas passing per minute.

It is good to live and learn. Cervantes.

(d) An electrically heated furnace.

(e) A tube in which the chemical changes take place.

(f) Rheostats.

(g) A pyrometer for accurately measuring temperatures in the furnace.

(h) A coil condenser for the separation of liquids, tars, and solids.

(i) A discharge gas tube.

(j) A calibrated cylinder for the collection over water of the discharge gas so that its volume, composition, and properties can be studied.

In order that this address may not be made tedious by the introduction of tabulations of results these have been omitted and will be published subsequently in a scientific and technical journal. It is sufficient, upon this occasion, to state that the experimental results were most gratifying in that the conditions of experimentation were learned whereby natural gas as a mixture, or its constituents separately, will undergo profound chemical changes when subjected to heat under varying conditions. Carbon black, unsaturated hydrocarbons, of both the olefines and acetylene series, and hydrogen are the direct and only products which are obtained when one set of conditions is observed, while on the other hand when another set of conditions is observed in addition to the products mentioned, benzol, toluol, naphthalene, etc., are produced.

The industrial application of the results of our experimental work has, so far, been confined to that set of conditions which had for its purpose the production of the greatest yield of the highest quality of carbon black. In the two plants which have been built the following are the representative results:

Kind of Gas.	*Ratio of gas passed to gas collected.*	*Carbon Black formed; lbs. per 1000 cu. ft.*	*B. T. U. of discharge gas.*	*B. T. U. of Inlet gas.*	*Per Cent. Unsaturated Hydrocarbon.*
Nat. gas	1.27	4.52	840	1142	6.75
Vent gas ...	1.42	6.44	861	1347	12.9
Propane	2.63	26.9	866	2600	26.2
Butane	2.99	38.2	702	3400	26.6

It will be observed, first, that natural gas, as a mixture, gives a yield of carbon black three times as high as that usually obtained by the wasteful process of incomplete combustion; and that the yields from the other gases are far in excess of those obtainable from ordinary natural gas.

Second: That the discharge gas is larger in volume than the inlet gas by ratios varying from 1,27 to 2.99. The heating value of the discharge gas is of necessity much lower in value than the inlet gas; however, the discharge gas has a heating value much superior to that of any artificial gas. The discharge gas is therefore a commercial one and if carbon black is the only product desired this gas can be put into the usual channels for delivery to market.

Third: That the discharge gas contains unsaturated hydrocarbons of the olefine series, mostly ethylene and that the amount varies from 6.75% to 26.6%. The olefine hydrocarbons are present in artificial gas and in a large measure are responsible for its luminosity. If it is desired these unsaturated hydrocarbons may be used by simple chemical reactions for the manufacture of:

(a) Glycols,

(b) Industrial alcohol, acetaldehyde, acetic acid, acetone.

(c) Chlorinated olefine solvents.

It is well known, in organic chemistry.

First: That members of the olefine series of hydrocarbons when treated under the proper conditions with potassium permanganate yield glycols.

Second: That olefine hydrocarbons when treated under the proper conditions with sulphuric acid yield compounds which on treatment with water give alcohols and regenerate the sulphuric acid.

Third: Oelfine hydrocarbons when treated directly with chlorine absorb the chlorine chemically and yield chlorine derivatives.

The glycols are, as a general rule, thick, colorless liquids and have a sweet taste. They are miscible with water and alcohol in all proportions. Recently these substances have been utilized as substitutes for glycerin in the manufacture of medicine, drugs, explosives, etc.

The extensive commercial use of alcohol is too well known to need much discussion. The largest commercial uses of industrial alcohol are for solvent purposes. In the manufacture of organic dyes, varnishes, explosives, tinctures, etc. Since the opening of the European War large demands have been made upon the alcohol industry for ether, acetaldehyde, acetic acid and acetone. All these substances may be obtained by simple well-known chemical reactions from industrial alcohol.

The chlorinated olefine derivatives have for the past few years been made in large quantities by other methods and have found extensive use in the rubber industry.

I have pointed out above that carbon black and olefine hydrocarbons can be produced from natural gas or its constituents separately. I have further pointed out the chemical possibilities of the olefine hydrocarbons. If both carbon black and olefine hydrocarbons are recovered from natural gas and utilized in any of the ways mentioned above there is left a residue mostly composed of hydrogen. This residue can be easily converted into a practically pure product by subjecting it to heat at a temperature slightly in excess of 1400° C. The opportunity therefore is open for the manufacture of pure hydrogen from natural gas. Hydrogen as is well known is used largely in war times for balloon purposes; however, its largest peace-time use is in the hydrogenation or hardening of oil. Tremendous quantities of cotton-seed and other edible oils are readily converted by means of hydrogen in presence of nickel as catalyst into solid products of fats which have wide economic and industrial importance.

It can thus be seen that by the decomposition of the natural gas or its constituents separately, valuable products can be obtained which have almost unlimited possibilities.

Practice in time becomes second nature.—Unknown.

Chemical Changes Which Natural Gas, or Its Constituents Will Undergo When Subjected to Chemical Change in the Presence of Other Substances and Without Catalysts.

This section of the address will be limited to the discussion of the chemical changes which occur when natural gas, or its constituents separately, are treated with the following reagents:

(a) Air, oxygen being the active component.

(b) Chlorine.

(*a*) *Reactions with air or oxygen.*

The use of natural gas as a fuel is nothing more or less than the taking advantage of the heat evolved when natural gas reacts chemically with the oxygen of the air. The chemical change which occurs results in the conversion of the paraffin hydrocarbons of natural gas into carbon dioxide and water. The formation of carbon dioxide and water is the final result of a whole series of intermediate chemical changes. It is to these intermediate chemical changes that I desire to call your particular attention at this time. Considered from the theoretical viewpoint, methane, the predominating component of natural gas, should yield, when treated under the proper conditions with air or oxygen, the following substances:

Methyl alcohol, formaldehyde, formic acid or carbon monoxide, carbon dioxide, and water.

H. S. Blackmore, United States Patent No. 774824 of November 15th, 1904, claims to have invented a process whereby methane when heated under a temperature of 260° F. with various metallic oxides as a source of oxygen obtains from 1500 cu. ft. of methane, 125 pounds of methyl or wood alcohol and at a temperature of 315° F. from 1500 cu. ft. of methane produces 118 pounds of formaldehyde. The metallic oxide used as a source of oxygen were ferroso-ferric oxide, cupric oxide, and manganese and barium dioxides.

In United States Patent No. 891753 another investigator has found that when methane is treated at temperaures from 86° F. to 122° F. with air in the presence of oak bark as catalyzer he obtains from less than 1 cu. ft. of methane slightly less than 4 pounds of formaldehyde. He also claims that small quantities of methyl or wood alcohol and formic acid are produced. An abstract of this work may be found in the Journal of the "Society of the Chemical Industry," Volume 27, page 918.

Glock, in German Patent No. 109014 claims that methane and air in equal volumes when passed through a tube containing granulated copper as a catalyst yields at a temperature of 112° F. formaldehyde in commercial quantities. Numerous other investigators as Otto, Coquillon, Bone and Smith, and Bone & Wheeler, have made similar observations, viz., that methane in the presence of air and catalysts at certain temperatures yields formaldehyde.

Dennis and Hopkins in the Journal of the American Chemical Society, Volume 21, page 309, give a description of a laboratory method of converting methane into carbon monoxide.

The speaker has personally investigated the conversion of methane into carbon monoxide and finds that under the proper conditions, to-wit:—(a) Relative values of compounds which on treatment with water give alcoholic methane and air interacting; (b) Presence of certain catalysts; (c) Definite rate of flow; and (d) Carefully regulated temperatures; that it is possible to convert methane into more than 90% of the theoretical quantity of carbon monoxide. This particular phase of the chemistry of methane was studied on account of the commercial importance of the following products which can be derived from carbon monoxide by simple chemical changes: (1) Carbonyl cholride or phosgene, (2) Formic acid, and (3) Oxalic acid.

Carbonyl chloride is used very extensively at the present time in offensive gas warfare and in the synthetic dye industry. It commands a price which is quoted as nominal. This means that the product is difficult to obtain and then only at a good price. Formic and oxalic acid find ready sale at from 35 to 45 cents per pound in large containers.

Lemoine and Senderens working independently in 1907 found that when carbon monoxide and chlorine in equal volumes are passed through a suitably constructed apparatus, containing wood charcoal as catalyst, react to produce quantitatively carbonyl chloride or phosgene. This is the commercial method of manufacture.

English Patents Nos. 4684 and 9008, French Patents Nos. 342168 and 421227 and numerous scientific articles describe processes for the manufacture of the salts of formic acid. These processes in the main consist of passing carbon monoxide in the presence of various catalysts at different temperatures in to caustic potash and quick lime under some pressure to produce the salts of formic acid. These salts by simple treatment with sulphuric acid yield pure formic acid. This acid is manufactured on a large scale in Germany by this process.

If the salts of formic acid as prepared by the methods just given are heated to temperatures, ranging from 680° F. to 770° F., these undergo chemical change resulting in the production of pure hydrogen and the salts of oxalic acid, from which oxalic acid can be derived by treatment with sulphuric acid. German Patent No. 229853 is a description of a process wherein 1% of borax of 5% of boric acid is used as catalysts. The optimum temperature is as given above and the yield is 88% of the theoretical. German Patent No. 269883 is a description of a process for the manufacture of oxalates from formates wherein the best temperature is given as 725° F. to 752° F. V. Merz and W. Weith in Berichte, Volume 15, page 1513, describe a process whereby sodium formates when heated out of contact of air at a temperature of 752° F. is converted into 70% of the theoretical quantity of exalate.

The above instances of the chemical changes which occur when methane is burned either in the presence of air or oxygen, are given for the purpose of showing the state of the art. The speaker feels that it is entirely possible to develop commercial processes whereby the following substances may be produced from natural gas:—

formaldehyde, formic acid, oxalic acid and carbonyl chloride.

(*b*) *Reactions with Chlorine*:

Since 1879 a great many chemists have devoted much time to a study of the problem of the chlorination of natural gas. Mallet has two patents on this subject—U. S. Patents Nos. 220397 and 880900. Professor C. Phillips of the University of Pittsburgh has published more or less extensively on this subject in the American Chemical Journal. Elworthy holds French Patent 35291 and German Patent 222919 covering processes on this subject. Baskerville and Hamor of the College of the City of New York have done more or less extensive work in this field. McKay holds U. S. Patent 1009428. The subject, therefore, is one which has received more than passing attention. The industrial application of the reactions and processes described in any of the above mentioned literature or patents has not been made. In the fall of 1915 the speaker in conjunction with his assistants took up the study of this problem. The natural gas which was used was that furnished by the Equitable Gas Company to the Mellon Institute of the University of Pittsburgh. The chlorine used was liquid chlorine produced by the Electro Bleaching Company of Niagara Falls, New York. The conditions of experimentation were varied from time to time until optimum conditions of operation were learned. It was found that when a mixture of natural gas (5 cu. ft.) was passed through a tube at a temperature of from 518° F. to 554° F. using clay, pumice, infusorial earth, or luminum chloride as catalysts, that a reaction occurred smoothly and regularly resulting in the production of the following substances:—methyl chloride, methylene, chloride, chloroform, carbon tetrachloride and muriatic acid together with small quantities of complex chlorinated hydrocarbons. Using the data derived from the laboratory work it was found by calculation that 1000 cu. ft. of natural gas when treated with 526.4 pounds of chlorine will give:

51.34 lbs. carbon tetrochloride, worth 15½c. per lb.
189.8 lbs. chloroform, worth 75c. per lb.
62.86 lbs. methylene chloride, market price nominal.
13.06 lbs. methyl chloride, market price nominal, and
567.00 lbs. muriatic acid, containing 37.9% of hydrogen chloride, worth 1¾c. per lb.

Both methylene chloride and methyl chloride can be easily converted into chloroform and carbon tetrochloride by another simple reaction, using metallic iron or ferric chloride as catalysts and the yields of chloroform and carbon tetrachloride increased.

There are many gas fields in the United States and Canada which are not only remote from market but which contain more than 95% methane and would thus be suitable for the manufacture of chloroform, carbon tetrachloride and muriatic acid. In consideration of the fact that practically all of the chlorine on the market today is manufactured at points where there is cheap power and that the gas spoken of is in regions remote from market it would be necessary for any natural gas producing company manufacturing these chlorinated products to install a plant for the manufacture of chlorine. Caustic soda and hydrogen in large quantities would be produced as by-products and these in turn would have to be disposed of or utilized profitably at the point of production. The success of industrial Germany along chemical lines is due to the fact that wherever an industry has been established and there are by-products resulting from this industry, additional processes have been installed or invested whereby nothing but finished products are obtained.

In other words, a program has been outlined which enables any one owning natural gas in regions isolated or remote from market to istall a series of processes by means of which all of the natural gas can be utilized in a highly important and commercial way.

Not only have the chlorination reactions of natural gas, as a mixture, been studied but particular attention has been paid to the chlorination of butane. On account of the fact that butane is a mother hydrocarbon of the following substances:—butyl chloride and butylene chloride, it is from these substances that a large number of important commercial products are obtainable theoretically. Butyl chloride should, under the proper conditions of chemical change, such as are well known in the laboratory, yield butyl alcohol, butyl aldehyde, butyric acid and dipropylkatone. Butyric acid is the fatty acid derivable by saponification from butter fat. Dipropylkatone is a product which has the same commercial uses as acetone and many other additional uses in the explosive industry. Butylene chloride upon treatment with alkalies yields a hydrocarbon known as butadiene. This hydrocarbon is of practical interest as it is the one which is the basis of the artificial rubber industry. In the *Journal of Metallurgical and Chemical Engineering* of May 1, 1917, pages 513 to 518, can be found an article giving a rather comprehensive statement of the chemical changes required to produce artificial rubber from butadiene. British patent No. 15,254 gives two methods of producing artificial caoutchouc. The methods are as follows:

(1) Butadiene dissolved in benzol is heated ten hours at 150° C. for a number of days.

(2) Butadiene condensed at a low temperature by means of ether and carbon dioxide is kept in an autoclave at 90° to 100° C. for four days. In both cases the solvents, unreacted upon material and by-products, are distilled off in vacuo or by steam, and a rubber-like mass remains.

Harries, in the *Annallen*, 1911, pages 157 and 383, describes another method whereby butadiene or its derivatives are heated with dosium wire. The yield is almost quantitative and the product obtained may be vulcaniezd quite readily. British Patent No. 26,550 claims an advantage over the Harries process by conducting the operation in the presence of carbon dioxide. Matthews in British Patent No. 2,070 effects the same change in the presence of sulphuric dioxide. The process of Matthems is essentially as follows:

Butadiene or its derivatives are heated with sodium wire in the presence of benzol. Liquid sulphurdioxide

No path of flowers leads to glory.—La Fontaine.

is then added to the cooled solution and the mixture warmed in a sealed vessel at 40 degrees C. After some time the vessel is opened when the solution is found to be very viscous and in some cases set to a jelly. On removal of the sulphur dioxide the product will be found to be elastic and to resemble natural caoutchouc.

The products obtainable by the various methods are elastic, easily soluble in the ordinary rubber solvents, and capable of vulcanization. Many scientists are at work endeavoring to discover a process whereby artificial rubber may be produced at a cost which will enable it to compete with the natural product.

The present status of the artificial rubber industry is much more promising than the artificial indigo industry was in its inception. The demand for indigo was relatively small, while the demand for rubber products has grown with remarkable rapidity along with the automobile industry. It is not to be expected that a synthesis so difficult and complicated as that of rubber could be effected without a great expenditure of time, energy, and money. The ground work has been well laid and I believe that American industry which is to be at once the servant and master of the world industry will not be found wanting in supplying all that is needed to develop a process for the production of rubber. Natural gas with its content of pentane and butane, which compounds can be readily and easily isolated, forms the hydrocarbon basis upon which the artificial rubber industry can be built.

Valuable By-Products Which May be Obtained by Synthetic Chemical Reactions From the Exhaust Gas of the Gas Engine.

About the middle of the 17th century Robert Boyle made the following statement:

> "The air is a confused aggregate of effluviums from such different bodies, that, though they all agree in constituting by their minuteness and various motions one great mass of matter, yet perhaps there is scarcely a more heterogeneous body in the world."

These words forcefully impress the fact that air is a mixture of several different gases. Oxygen, nitrogen, carbon dioxide and the rare or noble gases, are the main components of the atmosphere. Generally speaking the following is the average percentage composition of air, by volume, nitrogen 78.03; oxygen 20.99; rare or noble gases .95; carbon dioxide .03. Of the rare or noble gases argon exists in the largest quantity;—1,000 volumes of air contain approximately 9.37 volumes or less than 1% of argon.

When air is mixed with natural gas and this mixture exploded in a gas engine the hydrocarbons of natural gas react with the oxygen of the air to produce carbon dioxide and water vapor. The other constituents of air do not undergo any chemical change. The exhaust from a gas engine contains, therefore, nitrogen, the rare or noble gases, carbon dioxide, and water vapor. It is to these substances that I would have you pay particular attention at this time. If the exhaust gas is cooled by passage through coils sprayed with ordinary water and then compressed to a pressure of from 25 to 30 pounds practically all, if not all, of the water vapor present would be removed as liquid water. The remaining gas after such compression could then be treated according to a French patent of Georges Claude, for the recovery of carbon dioxide. In principle this process consists in passing the gas containing carbon dioxide through a body of liquid water under pressure, keeping the gravity of the water at such a point that practically all of the carbon dioxide is dissolved by the water at the temperature and pressure used. The unabsorbed gases consist of nitrogen and the rare or noble gases. The water containing the carbon dioxide dissolved under pressure can flow to a suitably constructed apparatus in which the pressure is lowered.

The carbon dioxide thus evolved can be picked up by a compressor and liquefied and as such sold on the market for all the purposes as carbon dioxide prepared in otner ways. R. F. Brownlee and R. H. Uhlinger have American patents No. 1,150,337 and No. 1,154,172 covering processes for the manufacture of carbon dioxide and nitrogen from natural gas.

In a preliminary report to the Ordnance Department of the War Department on the nitrogen industry by Charles L. Parsons published in the *Journal of Industrial and Engineering Chemistry* of September, 1917, pages 833 to 841, will be found a discussion of the methods utilized for the production of nitric acid and ammonia from the nitrogen of the air. Three of these processes—the Haber Process, the Cyanamid Process and the Cyanide Process, all require practically pure atmospheric nitrogen.

The Haber process is a German one and consists of taking hydrogen and nitrogen and causig them to undergo chemical change at a temperature of about 500° C. and at pressures from 125 to 150 atmospheres to form ammonia. This process is the one now mainly used in Germany. During the year 1917 the output by this process was equivalent to about 500,000 tons of ammonium sulphate. The ammonia obtained by this process can be oxidized and converted into nitric acid.

The cynanamid process is used quite extensively in both Europe and America. This process consists of heating calcium carbide to a red heat in the presence of nitrogen. The cyanamid produced is then powdered and mixed with sodium carbonate and lime and the mixture treated with steam in large autoclaves to convert the nitrogen of the cyanamid into ammonia. In 1917 the German production of cynanamid was approximately 400,000 tons. Cynanamid is not only useful as a source of ammonia and ammonium compounds but is well suited for use as a fertilizer when applied directly to the soil.

The cyanide process is, up to the present time, not a commercial success. The process consists of heating a mixture of sodium carbonate, ground coke or carbon in contact with finely divided iron to redness and then passing nitrogen through the mass. A reaction takes place rapidly resulting in the formation of sodium cyanide.

The Chemical Possibilities of Natural Gas.

It will be seen from the above that the nitrogen contained in the discharge gases from gas engines has many

chemical possibilities in the production of compounds which are industrially very important.

Argon and the rare or noble gases, on account of the fact that these substances undergo no chemical change of any kind will certainly be left in the residue gas after the recovery of carbon dioxide and the fixation of the nitrogen.

Raleigh was enabled to isolate argon and other rare gases from the atmosphere in 1893 by making use of the chemical inertia of these substances. Argon is a gas without color, taste or smell. It is incombustible and a non-supporter of combustion. Recently it has been shown that argon may find extensive use in the electric bulb industry.

The dawn of the day of the American industrial empire is upon us, and as the light of it breaks, the most splendid possibilities are revealed to us. In no field of commercial endeavor are its possibilities greater than in the industries having specifically to do with oil and gas. There are the possibilities of food for mankind and heat to prepare it for his growth and development. There is medicine to cure his ills and drown his sorrows; light to illumine his pathway and make it more cheery; materials to clothe, adorn and glorify the bodies of men. It is a most auspicious and prophetic time and one which is worthy of the most serious and thoughtful consideration. It is the time above all times when men of vision and men of courage are needed. It is not an impossible time, but is one where the greatest of results may be realized if the efforts are properly directed. Subsidized chemical and engineering research is the keynote to the commercial realization of the possibilities of this age. The Natural Gas Men's Association can do its bit by entering upon a program of subsidized and heartily supported research.

—Convention Natural Gas Association of America.

PRIORITY IN PRODUCTION.

CIRCULAR No. 4 has been issued by the Priorities Division of the War Industries Board. The following extracts are made in order that company members of the Natural Gas Association of America and our other readers may know the conditions under which their orders may be filled by manufactuers.

During the war in which the United States is now engaged all individuals, firms, associations, and corporations engaged in the production of raw materials and manufactured products (save foods, feeds, and fuels) are requested to observe the following regulations respecting priority, namely:

CLASSES PRESCRIBED.

1. All orders and work are divided into five general classes: Class AA, Class A, Class B, Class C, and Class D, with subdivisions of Class AA, Class A, and Class B, indicated by suffix number, thus: Class AA-1, Class AA-2, etc.; Class A-1, Class A-2, etc.; and Class B-1, Class B-2, etc.

CLASS AA DEFINED.

2. Class AA comprises only emergency war work of an exceptional and urgent nature.

CLASS A DEFINED.

3. Class A comprises all other war work; that is to say, orders and work necessary to carry on the war, such as arms, ammunitions, destroyers, submarines, battleships, transports, merchant ships, and other water craft, airplanes, locomotives, etc., and the materials or commodities required in the production or manufacture of same.

CLASS B DEFINED.

4. Class B comprises orders and work which, while not primarily designed for the prosecution of the war, yet are of public interest and essential to the National welfare or otherwise of exceptional importance.

CLASS C DEFINED.

5. Class C comprises all orders and work not covered by priortiy certificates issued by the Priorities Committee or not taking an automatic rating, in accordance with the provisions of Sections 7, 8, and 9 hereof, which orders and work are to be utilized in furtherance of one or more of the purposes embraced within the "General Classification of Purposes Demanding Preference Treatment" promulgated by the Priorities Board, appearing on page 17 of this circular, as same may be from time to time amended or substituted; or which orders and work are placed by or are to be utilized in connection with an industry or plant appearing on Preference List No. 1, promulgated and published by the Priorities Board under date of April 6, 1918 (as set forth on pp. 18-19) of this circular), and all amendments or substitutes therefor. No Class C certificates shall be issued.

CLASS D DEFINED.

6. Class D comprises all orders and work not embraced in Class AA, Class A, Class B, or Class C, and no certificates will be issued therefor. All orders for work or materials not covered by priority certificates or not taking an automatic classification in accordance with the provisions of Sections 8 and 9 hereof, and not taking a Class C classification under the provisions of Section 5 hereof, will fall within Class D.

AUTOMATIC CLASSIFICATIONS.

7. Each order placed after June 30th, 1918, by a duly authorized officer of the War Department or of the Navy Department of the United States, or of the United States Shipping Board Emergency Fleet Corporation, which falls within Class A as defined in Section 3 hereof, shall, by virtue of this rule, upon the placing of the order, automatically be classified as A-5, provided said order carries an indorsement personally signed by the officer placing the order, reading:

"Unless rerated by express order in writing by the Priorities Committee of the War Industries Board, this order is by authority of said Priorities Committee rated as Class A-5, and its execution shall take precedence over all your orders and work of a lower classification to the extent necessary to insure delivery according to the date specified herein, as prscribed by Circular No. 4, issued by the Priorities Division of the War In-

Heroism is the dazzling glorious concentration of courage.—Amiel.

dustries Board, of date July 1, 1916, and all amendments thereto."

8. Each order for materials, equipment, or supplies for the purposes of uses hereinafter in this section mentioned shall, by virtue of this rule, automatically take a classification as herein prescribed, namely:

(a) For the manufacture of turbines(all classes) A-4
(b) For the repair or construction of steam railroad locomotives for use on the railroads under the jurisdiction of the United States Railroad Administration A-4
(c) For the production of electrodes..... A-5
(d) For the manufacture of rope wire and wire rope A-5
(e) For the building of ships or other water craft for and under direct contracts with the United States Shipping Board Emergency Fleet Corporation A-5
(f) For the building of all cargo water craft (but not pleasure craft) save such as are under construction by or for the United States Shipping Board Emergency Fleet Corporation A-6
(g) For the manufacture of machine tools for working both metal and wood; of machinists' tools, of small tools, of hand tools. and of mining tools, machinery, and equipment A-6
(h) For the manufacture of steam railroad materials, equipment, and supplies (other than locomotives) for use on the railroads under the jurisdiction of the United States Railroad Administration B-1
(i) For the manufacture of locomotive cranes and traveling cranes B-1
(j) For the manufacture of electrical equipment other than turbines (but not electrical supplies as distinguished from equipment).... B-2
(k) For the manufacture of farm implements.... B-2
(l) For the manufacture of textile machinery..... B-2
(m) For the manufacture of tools, implements, machinery, and equipment required for the production, harvesting, distribution, milling, canning. and refining of foods and feeds B-2
(n) For the manufacture of binder twine and rope B-2
(o) For the manufacture of oil well supplies or equipment—by which is meant supplies for the production of petroleum and natural gas—but not including pipe lines, storage tanks of 1,000 barrels capacity or over, tank cars, or refineries..... B-2

No order shall take an automatic classification under the provisions of this Section 8 save where the person intending to use the materials, equipment, or supplies ordered states under oath in writing that they are to be used for one or more of the purposes mentioned in this section and for no other purpose, which affidavit shall be indorsed on or attached to the order and shall be in the form following:

"Unless rerated by express order in writing by the Priorities Committee of the War Industries Board, this order is by authority of said Priorities Committee rated as Class — under and by virtue of subdivision — of Section 8 of Circular No. 4 issued by the Priorities Division of the War Industries Board of date July 1, 1918, and all amendments thereto."

For the purpose of securing the said rating I do solemnly swear—

"(1) That I have taken and filed whatever pledge is required by the War Industries Board from the industry of which I am a member; and

"(2) That the materials, equipment, or supplies covered by this order are intended for use, and will be used, for the purpose or purposes mentioned in the said subdivision or subdivisions of said Sction 8, and for no other purpose."

9. Each order for materials, equipment, or supplies for such purposes or uses as fall within Class C as defined in Section 5 hereof will automatically be classed as Class C; provided the person intending to use the materials, equipment, or supplies ordered shall file with and as a part of said order an affidavit in writing in the form following:

"Unless rerated by express order in writing by the Priorities Committee of the War Industries Board, this order is by authority of said Priorities Committee rated as Class C under and by virtue of Section 9 of Circular No. 4 issued by the Priorities Division of the War Industries Board of date July 1, 1918, and all amendments thereto."

For the purpose of securing the said rating I do solemnly swear—

"(1) That I have taken and filed whatever pledge is required by the War Industries Board from the industry of which I am a member; and

"(2) That the materials, equipment, or supplies covered by this order are intended for use. and will be used, for the purpose or purposes mentioned and referred to in Section 5 of said circular and for no other purpose."

10. Where the party placing an order under Sections 7, 8 or 9 hereof conceives it to be in the public interest that the order should take a higher classification than the automatic classification prescribed herein, then in such event an application for such higher classification setting forth the reasons therefor may be filed and same will be considered by and promptly acted upon by the Priorities Committee. No such application should be made, however, save in cases where the automatic rating will not secure delivery on or near the date required, and such application must disclose facts evidencing that the public interest requires an earlier delivery of the order than can be secured under the existing automatic rating. The application must be made on the regular Priorities Committee Application Form P C 15.

CLASS D ORDERS.

11. All orders save such as are automatically classed under the provisions of Sections 7, 8 and 9 hereof, shall be automatically classed as Class D unless covered by certificates or other written directions issued in accordance with the rules and regulations embodied in this circular or amendments thereto.

Great thoughts come from the heart.—Vauvenargues.

RESULTS OF DRILLING—LATEST REPORTS

PENNSYLVANIA FIELD.

BRADFORD FIELD.

Fee, Mrs. E. C. Murphy	Dry
Bingham 2249, United Natural Gas 2994	Gas
Bingham 368, McIntosh et al. 14	Dry
Dry	2
Gas Well	1

MIDDLE FIELD.

Lot 5236, T. D. Collins Est. 155	Dry
Lot 5236, T. D. Collins Est. 156	Dry
Lot 387, Penn Oil 11	Dry
McKean, Haskell & Co. 21	Gas
Grandin, Sand Hill Oil 7	Gas
Mickelson, Burton & Co. 2	Gas
Merkle, Natural Gasoline 10	Dry
Swab, Limestone Oil 7	Dry
Siggins. G. B. Siggins 15	Gas
Dry	5
Gas Wells	4

VENANGO-CLARION.

Pithole Oil, Tague & Troutman 4	Dry
Lemmon, United Natural Gas 2	Gas
Nelson Stover. S. P. McCalmont est. 1	Dry
H. H. LeCrun. S. P. McCalmont est. 1	Dry
H. H. LeCrun, S. P. McCalmont est. 1	Gas
F. W. Mitchell, F. W. Mitchell est. 104	Dry
Thos. J. Watson, Watson Bros. 1	Dry
John Locke hrs., Wilson & Smith 6	Dry
Jerusalem. O. H. Culbertson 10	Dry
Stuart, Gilson & Clarion Natl. Bank 6	Dry
Dry	7
Gas	2

BUTLER-ARMSTRONG.

J. E. McDowell, Young Hindman et al. 2	Dry
Stone House. Phillips Gas	Gas
Turner, P. G. Turner	Gas
Dry	1
Gas	2

SOUTHWEST PENNSYLVANIA.

Washington—	
Pease. Mfrs. L. & H. Co. 1	Gas
Conger. Carnegie Gas Co. 1	Gas
Campsey-McClain. Taylorstown Gas Co 2	Gas
Montgomery, Mfrs. L. & H. 1	Dry
Dague. N. G. Co. of W. Va. 2	Dry
Plants. N. G. Co. of W. Va. 1	Dry
Bell, Peoples Gas Co. 7	Gas
Imperials—	
McCullough, Elsenbach & Co. 1	Dry
Dorseyville—	
Prager hrs., Amer. N. G. Co. 2	Dry
Keil est., Ring Oil 1	Dry
Beaver County—	
Sweringen hrs., Crown Pet. Co. 17	Dry
Milltown—	
Herron, J. B. Herron 1	Dry
Mt. Morris—	
Black Hrs. J. L. Garard 1	Dry
Rose, Shear O. & G. 1	Gas
Cole, Philadelphia Co. 1	Gas
Powers, City & Sub. Co. 1	Gas
Earnest, Mfrs. L. & H. 1	Gas
Miller, Mfrs. L. & H. 2	Dry
Clutter, Philadelphia Co. 1	Gas
Dry	10
Gas	9

WEST VIRGINIA.

Mannington—	
Gum, Hope Gas 3	Gas
Hughes, Reserve Gas 1	Gas
Wagoner, Hope Gas 1 q	Gas
Varner hrs., Stockton Oil 2	Dry
Glover, Carter Oil 2	Dry
Maxwell, Columbia Carbon 19	Gas
Bremen hrs., Carnegie Gas 2	Gas
Henry, Philadelphia Co. 4	Gas
O'Donnell, Hope Gas 5	Gas
Duckworth, I. O. & G. P. 7	Dry
Hall-Speer, Mfrs. L. H. 2	Gas
Howe, Hope Gas 1	Gas
Sutton, Hope Gas 1	Gas
Cornwell, Hope Gas 1	Gas
Monroe, Hope Gas 1	Dry
Johnson, J. H. McDermott Oil 1	Gas
Johnson, Philadelphia Co. 2	Gas
Sturms-Murray, Carter Oil 1	Dry
Cordry, So. P. O. 2	Gas
Murray Co., Carnegie Gas 3	Gas
McKinney, Carter Oil 1	Dry
Wetzel and Tyler—	
Wallace, Jennings Oil 1	Gas
Teagarden, Mfrs. L. & H. 3	Gas
Pendergast, Carnegie Gas 3	Gas
Miller, Hope Gas 1	Gas
Lantz, Mfrs. L. & H. 2	Gas
Lowe, Hope Gas 2	Gas
Long, Hope Gas 2	Gas
Duhurst, So. P. O. 28	Dry
Peterson, Hope Gas 29	Dry
County Poor Farm, Middlebourne O. & G. 8	Dry
Cook, Benedum-Trees Oil 1	Dry
Snodgrass Siler Hill Oil 2	Gas
Brooke Co.—	
Kirchner, Rockledge O. 2	Gas
Dellenbach, Dellenbach O. 10	Dry
Ulem, Smathers & Co. 1	Gas
Wood Co.—	
Ralston, Parsons & Sweeney Oil 10	Dry
Wise, Brown-Watterson Oil 1	Dry
Buzzard. Brown-Watterson Oil 1	Dry
Covert, Carter Oil 3	Dry
Ritchie Co.—	
Wilson, Hope Gas 5	Dry
Dotson, Philadelphia Co. 2	Dry
Jones, Hope Gas 1	Gas
Ford, Trainor Bros. 1	Dry
Hardman, Satterfield & Co. 1	Gas
Chamber, Ohio Valley Oil 2	Gas
Wirt Co.—	
Connelly, Davis & Turney 5	Dry
Kester, Relief Oil 1	Dry
Pleasants Co.—	
Tait, Tait Farm Oil 4	Gas
Hart, Jeannette Oil 1	Dry
Kanawha Co.—	
Gibson, So. P. O. 1	Dry
F. R. C. C. Co., F. R. C. C. 77	Gas
Goshon tract, O'Connell Oil 56	Gas

Sincerity and pure truth in every age still pass current.—Montaigne.

Cabell Co.—
Connor, Harshbarger O. & G. 4 ..... Gas

Dry 22
Gas 32

SOUTHEASTERN OHIO.

Perry Co.—
Clark, Carter Oil 2 ..... Dry
McDonald, Jenkins & Holden 12 ..... Dry
Hocking Co.—
Armstrong, Cube Oil 1 ..... Dry
Buckingham, Wattey & Martin 1 ..... Dry
Stephenson, Spicer O. G. 1 ..... Gas
Mender, O. F. S. 8 ..... Gas
Coshocton Co.—
Petry, L. N. G. & F. 1 ..... Gas
Frye, L. N. G. & F. 1 ..... Gas
Vinton Co.—
Tomlinson, O. F. S. 2 ..... Gas
Pence, Preston Oil 13 ..... Gas
Fairfield Co.—
Bashore hrs., Sun Oil 1 ..... Dry
Muskingum Co.—
Gill, E. H. Everett 1 ..... Dry
Buffe heirs, Evans Oil & Gas 6 ..... Dry
Athens Co.—
Brison, Willington-Athens G. 12 ..... Dry
Cunningham hrs., Willington-Athens G. 11 ..... Dry
Dale, H. E. Smith 236 ..... Dry
Mosier, Burns & Co. 20 ..... Dry
Bailey, Henne Oil 23 ..... Dry
Shaffer-Gerst, Goldish & Co. 4 ..... Dry
Hill, E. L. Hutchinson & Co. 10 ..... Dry
Cunningham, Wm. Patton & Co. 4 ..... Dry
Gerst, Wallace & Co. 1 ..... Dry
Noble Co.—
Boone, E. L. Hutchinson & Co. 1 ..... Dry
Marietta—
Brown, Brown & Walker 1 ..... Dry
Hill, J. H. Kiggins & Co. 1 ..... Dry
Miller, H. H. Hobizell & Co. 1 ..... Dry
Bush, Central B. & T. 13 ..... Dry
Smith, Clark Co. 1 ..... Dry
Day, Clark & Co. 1 ..... Dry
Deucher, Harris & Co. 1 ..... Dry
Barnett, F. Magrew & Co. 1 ..... Gas
Welch, Earl Stephens 1 ..... Dry
Musser, Hollstein Co. 1 ..... Dry
Wickens, J. T. Dillon & Co. 31 ..... Dry
Huntsman, Bredin Oil 10 ..... Dry
Westbrook, J. L. Watson & Co. 2 ..... Gas
Harrison Co.—
Benedum, Twin City O. & G. 1 ..... Dry
Jefferson Co.—
Stratton, C. M. Stratton 16 ..... Dry
Belmont Co.—
Thompson, N. G. Co. of W. Va. 1 ..... Gas

Dry 30
Gas 9

PENNSYLVANIA FIELDS.

SUMMARY OF COMPLETED OPERATIONS.

	Comp.	Prod.	Dry	Gas
Allegany	26	41	0	0
Bradford	54	150	2	1
Middle Field	27	23	5	4
Venango-Clarion	62	123	7	2
Butler-Armstrong	10	12	1	2
S. W. Penna.	34	75	10	9
West Virginia	121	732	22	31
S. E. Ohio	113	887	30	8
Total	447	2,043	77	57

CENTRAL OHIO.

FAIRFIELD COUNTY.

Greenfield—M. Starnes, Ohio Fuel Sup. 1 ..... Dry
Richland—Basore hrs., The Sun Co. 1 ..... Dry

Dry 2

ASHLAND COUNTY.

Lake—Barnard, Logan Gas & Fuel 1 ..... Gas
Perry—W. A. Shissler, Ohio Fuel Sup. 1 ..... Gas
Mohican—Z. W. Zimmerman, Ohio F. S. 1 ..... Gas

Gas 3

MEDINA COUNTY.

Leitchfield—Stranahan, Logan G. & F. 3 ..... Dry
Lafayette—Goldner, Ohio Fuel Supply 1 ..... Gas
D. W. Weightman, Medina G. & F. 2 ..... Gas

Dry 1
Gas 2

LORAIN COUNTY.

Grafton—Weigel, Ohio Fuel Supply 1 ..... Gas
Eaton—Thos. Gideon, Kundtz & Hulse 1 ..... Dry

Dry 1
Gas 1

WAYNE COUNTY.

Green—Weger, Logan Gas & Fuel 1 ..... Dry
Congress—Haley, Logan Gas & Fuel 1 ..... Dry
Cannan—Haskins-Owens, Logan G. & F. 2 ..... Gas
J. R. Shilling, Logan Gas & Fuel 3 ..... Gas
Jas. Clouse, Ohio Fuel Supply 1 ..... Gas
Geo. Carter, Ohio Fuel Supply 1 ..... Gas
Chippewa—A. & E. Repp, East Ohio G. 1 ..... Gas
Frank Busson, East Ohio Gas 1 ..... Dry
Clinton—P. Hickey, Medina Gas & Fuel 1 ..... Gas
C. E. Brown, Medina Gas & Fuel 1 ..... Gas
D. Alleman, Ohio Supply 1 ..... Dry

Dry 4
Gas 7

RICHLAND COUNTY.

Monroe—Culler, Medina Gas & Fuel 1 ..... Dry
W. V. Gladden, Logan Gas & Fuel 1 ..... Gas
Worthington—Snyder, Logan G. & F. 1 ..... Gas

Dry 1
Gas 2

CUYAHOGA COUNTY.

Dover—L. Kubash, Logan Gas & Fuel 1 ..... Gas
E. Bailey, Melrose Oil & Gas 1 ..... Dry
C. M. Limper, East Ohio Gas 2 ..... Gas
Middleburg—Price, Settlement Oil & Gas 1 ..... Dry

Dry 2
Gas 2

VINTON COUNTY.

Richland—Atkinson, Ohio Fuel Supply 1 ..... Gas
H. Saltz, Ohio Fuel Supply 1 ..... Gas
Martindale-Keiser, Ohio Fuel Sup. 1 ..... Gas
Harrison—S. R. Pratt, Ohio Fuel Sup. 1 ..... Dry
J. L. Maxwell, Ohio Fuel Supply 1 ..... Dry
J. F. White, Ohio Fuel Supply 1 ..... Gas
Swan—J. J. Davis, Ohio Fuel Supply 1 ..... Gas
Jackson—Tomlinson, Ohio Fuel Supply 2 ..... Gas

Dry 2
Gas 6

PERRY COUNTY.

Thorn—Mary Sivite, Ohio Fuel Sup. 1 ..... Gas
L. Hite, Ohio Fuel Supply 1 ..... Gas

The happiness of men consists in life. And life is in labor.—Tolstoi.

C. A. Hetrick, Ohio Fuel Supply 2 ..... Gas
M. Neal, Heisey Gas 1 ..... Dry
J. & E. Bope, Logan Gas & Fuel 5 ..... Gas

Dry 1
Gas 4

HOCKING COUNTY.

Salt Creek—P. Schwalwackhammer, Logan G. & F. 1 Dry

COSHOCTON COUNTY.

Tiverton—Perry, Logan Gas & Fuel 1 ..... Dry
Newcastle—C. Fry, Logan Gas & Fuel 1 ..... Gas

Dry 1
Gas 1

CENTRAL OHIO.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry	Gas
Fairfield	2	0	2	0
Knox	0	0	0	0
Ashland	3	0	0	3
Medina	3	0	1	2
Lorain	2	0	1	1
Wayne	14	230	4	7
Richland	3	0	1	2
Cuyahoga	4	0	2	2
Vinton	5	0	2	3
Perry	5	0	1	4
Hocking	1	0	1	1
Holmes	2	80	0	0
Coshocton	2	0	1	1
Jackson	0	0	0	0
Total	46	310	16	26

LIMA FIELD.

HANCOCK COUNTY.

Marion—Lot, City of Findlay Water W. 3..... Gas

AUGLAIZE COUNTY.

Washington—Schneider, E. A. Bream 2..... Dry

SENECA COUNTY.

Liberty—Mark Lister, The Sun Co. 3..... Dry
W. Kuder, Paragon Refg. 1 ..... Dry

Dry 2

LUCAS COUNTY.

Waterville—Stitt, Robt. G. Stitt 8 ..... Dry

WYANDOT COUNTY.

Crane—S. H. Hunt, Ralph Bros. 14 ..... Dry

FULTON COUNTY.

Wauseon—Unknown, H. A. Dempsey 1 ..... Gas

LIMA FIELD.

SUMMARY OF COMPLETED WORK.

	July, '18			June, '18		
	Comp.	Prod.	Dry	Comp.	Prod.	Dry
Wood	10	286	0	9	71	1
Hancock	8	43	1	7	60	1
Allen	3	30	0	4	35	0
Auglaize	7	40	1	5	35	0
Sandusky	4	16	0	4	26	0
Mercer	3	28	1	1	20	0
Van Wert	5	88	0	2	10	0
Seneca	3	20	2	3	225	1
Lucas	1	0	1	1	10	0
Ottawa	5	33	0	4	30	1
Wyandot	1	0	1	0	0	0
Williams	1	10	0	0	0	0
Fulton	1	0	1	0	0	0
Total	52	594	8	40	551	4

INDIANA FIELD.

JAY COUNTY.

Penn—A. Hutzler, Jones & Lyons 1 ..... Dry

GRANT COUNTY.

Fairmount—Lindsay, Little Husky Oil 1 ..... Dry

HUNTINGTON COUNTY.

Salamonie—L. Jones, Marsh Petroleum 5..... Dry

GIBSON COUNTY.

Washington—E. Hyneman, Indian Ref. 2..... Dry
Mollie Nixon, Indian Ref. 4, 5..... Dry
W. S. Jones, Henley & Co. 2..... Dry
E. S. McDonald, Andy Bruner & Co. 5..... Dry
W. Thompson, Henley & Co. 2..... Dry

Dry 6

PIKE COUNTY.

Madison—Henry Mallot, Ohio Oil 2 ..... Dry
H. G. Gladish, Cooper & Co. 1..... Dry
W. E. Lamb, Oliphant & Riggs 1 ..... Dry
Monroe—Carter, J. C. Heudrick & Co. 1..... Dry
Logan—McGillum, Indian Ref. 1 ..... Dry

Dry 5

SULLIVAN COUNTY.

Thurman—Hopewell, H. & S. O. & G. 2..... Dry
Gill—C. Johnson, Gambill & Co. 1..... Dry

Dry 2

INDIANA FIELD.

SUMMARY OF COMPLETED WORK.

	July, '18			June, '18		
	Comp.	Prod.	Dry	Comp.	Prod.	Dry
Wells	1	20	0	0	0	0
Jay	2	5	1	2	0	2
Adams	1	8	0	0	0	0
Grant	2	5	1	1	0	1
Huntington	5	85	2	2	5	1
Delaware	1	40	0	4	8	1
Randolph	0	0	0	8	19	1
Gibson	7	2	6	7	67	2
Pike	14	239	5	7	365	1
Sullivan	4	43	2	5	0	5
Total	37	447	17	36	464	14

KENTUCKY-TENNESSEE.

WAYNE COUNTY.

Steubenville—Ozias Smith, Wood Oil 10 ..... Dry
Parmleysville—R. L. Bell, J. T. Hemphill & Co. 1.... Dry
Jas. Gregory, L. G. Neely 68..... Dry

Dry 3

LAWRENCE COUNTY.

Busseyville—W. A. Cobley, Ohio Fuel Oil 1..... Dry

MORGAN COUNTY.

Cannel City—K. B. C. Coal, Pluto O. & G. 4..... Dry
Wiley Gullitt, Atlantic O. & Prod. 1..... Dry
J. B. Little, Mullen & Co. 1..... Gas

Dry 2
Gas 1

The want of goods is easily repaired; but the poverty of the soul is irreparable.—Montesquieu.

ESTILL COUNTY.

Irvine—H. T. Williams, Brode, Reis & Holden 2 .... Dry
Mary Flynn, Harris & Co. 1 .... Dry
Wager hrs., Lexington Oil Corp 5 .... Dry
A. M. Wagers, Lexington Oil Corp. 12 .... Dry
R. Witt, W. J. Griggs 1 .... Dry

Dry 5

POWELL COUNTY.

Pilot—Pruitt-Miller, Petroleum Expl. 37 .... Dry
Abbie McCoy, Wood Oil 21 .... Dry
Elijah Baker, Cherokee Oil 21, 22 .... Dry
Simp McIntosh, Alex Summers 3 .... Dry
Weed Townsend, Cumberland Pet. 7, 9 .... Dry
Robt. Helton, Cumberland Pet. 7 .... Dry

Dry 6

LEE COUNTY.

Beattyville—Rolly Newton, Quaker Oil 1 .... Dry
Crabtree, Greely & Co. 1 .... Dry
D. B. Kincaid, Atlantic Oil Prod. 1 .... Dry
Little Sinking, Ziegler & Howell 1 .... Dry
John Martin, Hopkins & Son 1 .... Dry
Burk-Hall, Russell Oil 6 .... Dry
Allen & Son, John Jewell 2 .... Dry
Hall-Burk, Russell Oil 7 .... Dry

Dry 8

ALLEN COUNTY.

Scottsville—Johnson, Jos. O. Hamilton O. & G. 7 .. Dry
Adam Grubb, Hoge O. & G. 3 .... Dry

Dry 2

WHITLEY COUNTY.

Williamsburg—Young, Empire O. & G. 1 .... Dry

LAUREL COUNTY.

London—Seely, Shira & Co. 1 .... Dry

ROCKCASTLE COUNTY.

Broadhead—Z. B. Hall, Sun Co. 1 .... Dry
C. Houk, Barnes & Cromwell 1 .... Dry

Dry 2

JOHNSON COUNTY.

Paintsville—Conley, Bed Rock Oil 1 .... Gas

OWSLEY COUNTY.

Island City—Owsley O. & G. 1 .... Dry

CASEY COUNTY.

Liberty—C. Burk, Unknown 1 .... Dry
Evans, Unknown 1 .... Dry
Coffey, Unknown 1 .... Dry
Caudiff, Unknown 1 .... Dry

Dry 4

KENTUCKY-TENNESSEE.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry	Gas
Wayne	4	10	3	0
Wolfe	5	27	0	0
Lawrence	5	21	1	0
Morgan	4	5	2	1
Estill	46	409	5	0
Powell	32	202	8	0
Lee	105	3,095	8	0
Allen	13	475	2	0
Barren	7	70	0	0
Whitley	1	0	1	0
Laurel	1	0	1	0
Rockcastle	2	0	2	0
Knox	7	40	0	0
Magoffin	2	10	0	0
Johnson	3	10	0	1
Pulaski	3	20	0	0
Owsley	1	0	1	0
Casey	4	0	4	0
Jackson	2	30	0	0
Ohio	1	5	0	0
Total	248	4,420	38	2

ILLINOIS FIELD.

CLARK COUNTY.

Parker—W. H. Troughton, Geo. H. Stahr & Co. 2 .. Dry
Casey—Geo. Sloan No. 2, Geo. H. Stahr & Co. 6 ... Dry
King Estate, Geo. H. Stahr & Co. 10 .... Dry

Dry 3

CRAWFORD COUNTY.

Montgomery—Luke Lance, Kentucky Oil 2 .... Dry
Honey Creek—F. M. Rich, Indiana Oil 1 .... Dry
Thos. Wesley, Ohio Oil 9 .... Dry

Dry 3

LAWRENCE COUNTY.

Dennison—J. B. Jett, Parks Oil & Gas 1 .... Dry
Wm. Jones, Illinois-Pittsburgh Oil 1 .... Dry
Lawrence—J. A. Seed No. 2, Ohio Oil 10 .... Dry

Dry 3

CLINTON COUNTY.

Irishtown—Rogan, Southern Ill. Gas 3 .... Dry
Wade—J. O. Koch, Southern Ill. Gas 2 .... Dry

Dry 2

WABASH COUNTY.

Wabash—H. Buchanan, Associated Prod. 9 .... Dry

COLES COUNTY.

Hutton—W. H. Berkley, National Stock Yards Oil 1 . Dry
East Oakland—W. Hawkins, Woman's Federal Oil 1 Gas

Dry 1
Gas 1

ILLINOIS FIELD.

SUMMARY OF COMPLETED WORK.

	July, '18			June, '18		
	Comp.	Prod.	Dry	Comp.	Prod.	Dry
Clark	8	34	3	12	103	3
Crawford	16	277	3	19	247	4
Lawrence	12	565	3	4	105	0
Clinton	2	0	2	1	2	0
Wabash	3	90	1	0	0	0
Jasper	0	0	0	1	3	0
McDonough	3	12	0	2	10	0
Coles	2	0	2	1	0	1
Washington	0	0	0	1	0	1
Total	46	978	14	41	470	9

MID-CONTINENT.

BUTLER COUNTY.

12-21- 3, Lichliter, Box More Oil 1 .... Dry
3-23- 7, Kreisel, British American Oil 1 .... Dry
7-26- 7, DeMoure, Rockhurst Oil 1 .... Dry
25-25- 7, Harsh, Central West Petroleum 1 .... Dry
6-27- 5, Armstrong, Theta Oil 1 .... Dry

The wrong way always seems the more reasonable.—Moore.

4-26- 4,	Fulkerson, Empire G. & F. 3	Dry
4-27- 4,	Daniels, Magnolia Petroleum 1	Dry
4-24- 9,	Hartenbower, Liquid Wealth Oil 1	Dry
9-29- 4,	Elder, Empire G. & F. 4	Dry
21-26- 4,	Waite Prirce et al 1	Dry
9-29- 4,	Harter, Mid-Kansas Oil 5	Dry
9-29- 4,	Harter, Empire G. & F. 3	Dry
9-29- 4,	Minor, Mid-Kansas O. & G. 14	Dry
2-27- 5,	Smock, Cosden Oil & Gas 4	Dry
8-25- 5,	Wilson, Empire G. & F. 104	Gas
15-26- 4,	Turner, Uncle Sam Oil 1	Dry
12-27- 4,	Skaer, Caster Oil 1	Dry
7-29- 4,	Cline, Standish Oil 1	Dry
25-26- 4,	Simkins, Wichita Augusta Oil 3	Dry
13-29- 3,	Lichliter, Empire G. & F. 1	Gas
29-25- 5,	Stapleton, Empire G. & F. 19	Gas
27-27- 4,	Palmer, Magnolia Petroleum 13	Dry
30-28- 4,	Dine, Empire G. & F. 1	Dry
14-26- 6,	Williams, Dropers Oil 1	Dry
12-27- 3,	Nelson, E. E. Johnson et al. 1	Dry
32-25- 7,	Reece, Diamond Oil 1	Dry
28-26- 5,	Wagoner, Wichita Crude Oil 1	Dry
21-27- 4,	Loomis, Paragon Oil 25	Gas
4-27- 4,	Hammond, Cosden O. & G. 1	Dry

Dry	25
Gas Wells	4
Gas Production	4,000,000

CHAUTAUQUA AND ELK COUNTIES.

35-33-11,	Akerman, Puritan O. & G. 1	Dry
30-33-12,	Fortner, Begg et al. 1	Dry
14-34- 9,	Holroyd, McMann Oil 1	Dry
28-34-12,	Gibbs, Puritan Oil & Gas 3	Dry
34-31-12,	Guthrie, West & Hazlett 4	Gas
26-31-12,	Castor, C. L. Ashley, Tr., 4	Dry
15-32-12,	Weaver, Navajo Oil & Gas 3	Dry
21-32-12,	McKay, Styles et al. 2	Gas
29-31-13,	Dexter, Bliss & Co. 9	Gas
31-31-13,	Sennetta, Willis Bros. 3	Gas
31-31-13,	Jones, Dexter et al. 1	Gas
22-32-12,	Dinsmore, Mary Holliday 1	Gas
4-32-12,	Jamerson, Sachem Oil 6	Dry
20-31-13,	Fee, J. Dexter 1	Gas
30-31-13,	Crump, Harlow et al. 1	Dry
31-31-13,	Rule, Cook et al. 1	Gas
14-32-12,	Jamerson, Sachem Oil 6	Dry
26-32-13,	Aken, J. M. Clark 1	Dry
24-32-12,	Holliday, Mary Holliday 13	Gas
17-31-13,	Harris, Oak Valley Oil & Gas 1	Gas
27-31-13,	Castor, Keef & Morrison 1	Gas
22-32-12,	McKey, Styken et al. 3	Gas
16-31-12,	Wood, Styken & LaDow 1	Gas

Dry	10
Gas Wells	13
Gas Production	18,000,000

MONTGOMERY COUNTY.

24-34-15,	Hulings, Labette Oil 9	Gas
28-34-15,	Jabbon, L. M. Roome et al. 1	Dry
25-34-15,	Kooger, E. A. Durham 1	Dry
21-33-14,	Brownlee, W. M. Hood 2	Dry
24-32-14,	Inscho, W. F. Potter 8	Gas
21-34-14,	Henry, J. F. Overfield 14	Dry
30-33-14,	Huffman, Amherst Oil 1	Dry
21-33-14,	Brownlee, W. M. Hood 2	Dry
10-33-14,	Fee, Gopher Oil 7	Dry
31-32-14,	Hoffman, Burkdall et al. 2	Dry
4-32-14,	Owen, A. A. Small 1	Dry
20-32-14,	Woody, Dover Oil 9	Dry

Dry	10
Gas	2
Gas Production	1,000,000

WILSON COUNTY.

22-30-16,	Senta, Clay & Powell 1	Dry
35-30-16,	Ayers, New Albany O. & G. 1	Dry
21-29-16,	Thursman, Altoona O & G. 2	Gas
21-29-16,	Thurman, Altoona O. & G. 2	Gas
36-29-15,	Adams, Wilcox O. & G. 2	Dry
5-27-14,	Fredonia Oil & Gas 1	Gas

Dry	3
Gas Wells	3
Gas Production	2,000,000

NEOSHO COUNTY.

13-27-19,	Crapson, L. S. Cambern 7	Gas
13-27-19,	Smith, L. S. Cambern 1	Dry
5-27-18,	Castor, Commonwealth Oil 3	Dry
2-28-18,	Fee, Spangler 1	Dry
23-27-18,	Rush, J. H. Evans et al. 4	Dry
13-27-19,	Smith, L. S. Cambern 1	Dry
5-27-18,	Houston, Commonwealth Oil 3	Dry
1-29-18,	Quinn, Moore Bros. & Loy 1	Dry
33-26-16,	McGavern, W. A. Cox 4	Dry
2-28-18,	Fee, C. W. Spangler 2	Dry

Dry	9
Gas Well	1

MIAMI, FRANKLIN AND DOUGLAS COUNTIES.

36-16-20,	Oakes, Hall & Dunn 1	Dry
4-16-12,	Seyler, J. H. Milligan 2	Gas
31-16-21,	Definbaugh, Peerless O. & G. 16	Dry
25-16-21,	Pflug, T. W. Reid et al. 1	Dry
15-17-22,	Tice (owner not named) 2	Dry
17-17-23,	Kepple, Midwest Petroleum 7	Dry
21-17-22,	....., I. N. Miller 1	Dry
20-14-21,	Fuhs, Reid et al. 1	Gas
34-16-21,	Anthony, Wright Prodn. 5	Dry
18-16-21,	Todd, Minnesota-Wyo. Petr. 2	Dry
4-16-21,	Lattakay, J. H. Milligan 3	Gas
12-16-21,	Todd, Minnesota-Wyo. Petr. 3	Dry
19-17-22,	Kirschner, Mason et al. 1	Dry

Dry	10
Gas	3
Gas Production	500,000

WILDCATS.

	Greenwood County—	
16-24-10,	Armstrong, Rice et al. 1	Dry
10-26-13,	Sample, West Va. Oil 1	Dry
9-25-11,	Christy, Kansas Distributing 2	Dry
3-26-11,	Springstead, Rockhurst Oil 1	Dry
35-27- 8,	Edgar, Empire G. & F. 1	Dry
	Cowley County—	
12-33- 4,	Melville, Empire G. & F. 1	Dry
26-33- 4,	Sparks, Empire G. & F. 1	Dry
	Sumner County—	
10-25-1w,	Birch, Kansas City Oil 1	Dry
	Woodson County—	
23-26-16,	Stevens, Burns et al. 1	Dry
13-25-16,	Harder, Latherman et al. 1	Dry
22-25-16,	Harder, Arona O. & G. 6	Gas
9-24-16,	Sankey, Int. Petro. 1	Dry
12-26-16,	Kannard, Smuggles O. N. G. 1	Dry
	Pratt County—	
10-30-12w,	Gibson, Holliday et al. 1	Dry
	Woodson County—	
19-23-16,	Headaway, Perry Okla. Oil 1	Dry

Dry	14
Gas Wells	1
Gas Production	2,000,000

The noise of arms deafens the voice of the laws.—Montaigne.

OKLAHOMA.

WASHINGTON COUNTY.

15-26-13, Brown, Dewey Portland Cement 2	Gas
2-27-14, McKay, Cusenberry & Co. 1	Dry
8-28-14, Davis, Seaman Oil & Gas 1	Gas
24-28-13, Parks, H. F. Tyler 5	Dry
13-26-13, Brent, N. Y.-Okla. Oil 6	Dry
29-26-14, Truskett, Middle State Oil 1	Dry
Dry	4
Gas	2
Gas Production	1,000.000

OSAGE COUNTY.

15-23- 8, Carter Oil 6	Dry
3-26-10, P. O. & G. and Elmer Oil 1	Dry
29-25-10, Echo & Devonian Oil 12	Dry
7-20-12, Canary & Stilwell 1	Dry
15-20-12, Texas Co. 1	Dry
36-27-10, Sterling Oil & Gas 5	Dry
14-26-11, Indian Territory Ill. Oil 221	Gas
9-25- 9, Pawhuska Gas 1	Gas
17-22-12, Magnolia Pet. 1	Dry
9-23-12, Tidal Oil 2	Dry
14-26-11, Indian Territory Ill. Oil 211	Gas
31-25-11, Enterprise Transit 1	Dry
5-21-10, Carter Oil 5	Dry
4-21-10, Texas Co. 1	Dry
5-20-12, F. A. Gillespie 3	Dry
4-21-10, Kewanee Oil 6	Dry
23-23-11, Winona Oil 1	Dry
33-22-10, Winona Oil 13	Gas
27-22-12, Magnolia Petroleum 13	Dry
21-27-11, Indian Territory Ill. Oil 215	Gas
6-23- 9, R. & M. Oil 1	Dry
11-25-11, Steyner Oil 16	Dry
23-25-11, Winona Oil 1	Dry
36-24- 8, Price Oil & Gas 8	Dry
Dry	19
Gas	5
Gas Production	19,000,000

NOWATA AND ROGERS COUNTIES.

Cherokee Shallow—	
18-25-17, Glass, Liberty Dev. 1	Dry
18-25-17, Carey, Carey O. & G. 2	Dry
28-25-18, Bowlin, Cosos Oil 1	Dry
29-26-15, Yager, Tollerton et al. 1	Dry
1-26-16, Ball, Smith & Whan et al. 1	Gas
28-24-17, Melton, Melton Oil 7	Dry
20-26-15, Kulchinski, J. J. Riner, agt. 7	Dry
11-24-16, Heaps, Kiefer Oil 2	Dry
Dry	7
Gas	1
Gas Production	Small

TULSA COUNTY.

Bird Creek, Flat Rock, Etc.—	
23-21-14, Place, Colburn et al. 3	Dry
15-20-14, Rose, Tulsa Fuel 1	Dry
17-20-13, Barmes, Rose et al. 3	Dry
36-20-13, Starkey, Togo Oil 2	Dry
20-23-12, Webb, Savoy Oil 1	Dry
33-21-14, Franks, Barnes et al. 1	Gas
Red Fork and Sand Springs—	
11-18-12, Dell, A. D. Nickelson 4	Dry
13-19-10, Cowan, Billinslea et al. 1	Dry
20-19-11, Thomas, Campbell & Baker 1	Gas
21-19-11, Payne, Texas Co. 1	Gas
10-20-11, Sand Springs Home 1	Gas
Broken Arrow and Jenks—	
11-19-13, Thomas, Mills & Kerr 1	Gas
24-18-14, Beaver, Kawfield O. & R. 1	Dry
1-18-13, Sango, Miner et al. 4	Dry
13-18-14, Haikey, Reynolds et al. 2	Dry
19-18-13, Block 45, Continental Dev. 1	Dry
32-18-13, Manuel, Murray et al. 1	Gas
32-18-13, Brown, Ira Short et al. 1	Dry
Bixby and Leonard—	
11-17-13, Couch, Galbreath et al. 1	Dry
14-17-14, Grayson, Pittman et al. 1	Dry
26-16-13, Ackley, Dolby et al. 1	Gas
28-16-13, Puryear, Caney River Gas 3	Gas
Dry	14
Gas Wells	8
Gas Production	20,000,000

OKMULGEE COUNTY.

Mounds District—	
27-16-11, Hanley, Paraffin Oil 4	Dry
33-16-11, Peters, Eastern Oil 1	Dry
35-16-11, Leath, Texas Co. 1	Gas
11-16-12, Coffey, Alexander & Clark 3	Dry
2-16-10, Snow, Kingsmith Ref. 12	Dry
10-16-10, Thomas, Aladdin Oil 2	Dry
27-16-11, Lewis, Carter Oil 2	Gas
27-16-11, Hanley, Paraffin Oil 2	Gas
27-16-11, Webb, P. O. & G. 1	Dry
Hamilton Switch—	
35-14-12, Checotam, Davidson et al. 2	Dry
30-14-12, Huckaby, C. B. Shaffer 1	Gas
35-14-12, Smith, L. S. Skelton 1	Dry
Bald Hill and Booch Sand—	
12-14-13, Snakeeye, Braniger & McGinley 1	Dry
14-15-14, Scott, Okla. Queen Oil 15	Dry
34-15-14, Grayson, M. L. Carr 14	Dry
17-14-14, Morton, Nuco Oil 3	Dry
18-14-13, Berryhill, Mid-Cont. Dev. 4	Gas
21-14-14, Morris, R. G. Tower 3	Dry
17-14-15, Smith, Clifton & Weis 3	Dry
28-14-14, Andy, Douglas & Wheeler 1	Dry
22-14-14, Uoble, McClelland Bros. 5	Dry
4-14-14, Hart, Twin States Oil 3	Gas
21-15-14, Garrett, Payne Oil 4	Dry
17-14-14, Morton, Weston Oil 6	Dry
22-14-14, Wright, McClelland et al. 7	Dry
Youngstown and Tiger Flats—	
2-13-11, Lewis, Kimberley & Cook 1	Gas
12-13-11, Seibert, Kimberley & Cook 1	Dry
20-12-12, Fixico, Twin State Oil 9	Dry
6-14-11, Robinson, Iams & Vincent 1	Dry
1-13-11, Walker, Gladys Belle Oil 2	Gas
10-14-11, Birney, Solo Oil 4	Gas
3-12-11, Morgan, P. O. & G. 1	Dry
Okmulgee and Morris—	
8-13-14, Walker, D. Parker et al. 3	Dry
2-13-13, Hightower, Nile Oil 2	Dry
16- 3-14, Morton, Oklamoa Oil 5	Dry
24-13-13, McGilbra, Gladys Belle Oil 5	Gas
23-13-14, Scott, F. H. King 8	Dry
Dry	27
Gas Wells	10
Gas Production	63,000,000

MUSKOGEE, WAGONER AND ROGERS.

Coweta—	
30-17-15, Childers, Harris & Hugo 7	Dry
30-17-15, Childers, Harris & Hugo 6	Dry
19-17-15, McIntosh Oil 1	Dry
East of Broken Arrow—	
19-18-15, Tiger, Webster et al. 6	Dry
14-18-16, Wiley, Gladys Belle Oil 1	Dry
Collinsville—	
7-22-16, Young, Imperial Oil 1	Dry
32-22-14, King, Tulsa Fuel 1	Gas
Haskell and Stone Bluff—	
36-15-15, Colbert, Lint Oil 4	Dry
9-16-15, Vann, Black Hawk Oil 4	Dry
20-15-16, Woodall, 500 O. & G. 1	Gas

Love truth, but pardon error.—Voltaire.

17-15-16, Harrison, Okla. Nat., Peterson et al. 9.... Gas
20-15-16, McIntosh, Caney River Gas 2 ..... Gas
27-15-16, Doyle, Lucky Tiger Oil 1 ..... Dry
10-15-16, Perryman, Los Animas O. & G. 3..... Gas
9-15-15, Jackson, Kistler 1 ..... Dry
34-16-15, Barnett, Dixie Oil 1 ..... Gas
20-15-16, Mc ntosh, Caney River Gas 3..... Gas
27-15-16, Doyle, Cosden O. & G. 1..... Gas
Boynton and Cole Pool—
3-14-15, Smith, Capps & Rose 2 ..... Dry
7-13-15, Freeman, Williamson 3 ..... Gas
8-13-15, Grayson, C. J. Lambert et al. 1..... Dry
14-13-15, Dan, Navajo Pet. 1 ..... Dry
14-13-15, Walker, Navajo Pet. 2 ..... Gas
4-14-16, Rentie, James Whitesides 6 ..... Dry
6-14-16, Canada, Longfellow & Underwood ..... Dry
9-14-16, Franklin, Butler & Young 2 ..... Dry
21-13-16, Stover, Star Oil 2..... Dry
13-13-15, McGilbra, J. McCoach 1 ..... Dry

Dry 13
Gas Wells 10
Gas Production 50,000,000

CREEK POOL.

Glenn Pool—
32-18-12, Wilcox, C. G. Tibbens 2 ..... Dry
35-17-10, Snow, H. C. Wilson 2 ..... Dry
26-17-11, Marshall, Amo Oil 1 ..... Dry
3-17-10, Taylor, Eastern Oil 1 ..... Dry
3-18-12, Vance, F. A. Baker 3 ..... Dry
35-17-12, Leath, Monitor Oil & Gas 1..... Dry
Cushaig and Olive—
4-16- 7, Williams, Magnolia Pet. 18..... Gas
14-18- 7, P. O. & G. 2 ..... Dry
12-18- 7, Sullivan, Gypsy Oil 1 ..... Gas
36-18- 7, Jones, Magnolia Pet. 1 ..... Gas
18-17- 8, Tucker, P. O. & G. 1..... Dry
2-16- 7, Scales, Cushing Dev. 1 ..... Dry
36-18- 7, Jones, Carter Oil 2 ..... Gas
Mannford—
28-18- 9, McIntosh, Wolverine Oil 1 ..... Dry
17-18- 9, West Texas Co. 1 ..... Gas
35-17-10, Snow, H. C. Watson 2 ..... Dry
3-17-10, Taylor, Ea tern Oi 1 ..... Dry
27-18-10, Barker, Billingslea et al. 2..... Dry
Kelleyville and Bristow—
2-15- 9, Briscoe, Joe Abraham 1..... Gas
34-16- 9, Brady, Joe Abraham 1 ..... Gas
11-16-10, Tillie, Gladys Belle Oil 1..... Dry

Dry 14
Gas Wells 7
Gas Production 18,000,000

PAWNEE COUNTY.

Cleveland and Jennings—
25-20- 8, Head, Sou. O. F. Corp. 1..... Dry
7-21- 8, Price, O. F. Corp. 2 ..... Dry
1-20- 7, Murphy, Selby and Gypsy Oil 3..... Gas
4-20- 7, Lowe, M. Lowe et al. 1..... Dry
19-21- 8, Skinner, Skinner et al. 2..... Dry
24-20- 8, Wasson, Claremont Oil 1 ..... Dry
25-20- 5, Buehler, Magnolia Pet. 1..... Dry

Dry 6
Gas Wells 1
Gas Production 6,000,000

PAYNE COUNTY.

Yale, Quay, Etc.—
11-18- 5, Cole, Roma Oil 1 ..... Gas
26-18- 5, Cottron, Home Oil 6..... Gas
26-18- 5, Cottron, Home Oil ..... Gas

Gas Wells 3
Gas Production 2,000,000

KAY COUNTY.

Blackwell, Ponca City and Newkirk—
10-28n-2e, McMichael, Carter Oil 1..... Gas
29-28- 1, Long, National Union Oil 9..... Gas
25-28- 1, Atney, Blackwell O. & G. 1..... Gas
33-27- 3, Keen, Marland et al. 1..... Dry
6-28- 1, Blackwell O & G. 1..... Dry
10-27- 1, Humphreys, Blackwell O. & G. 2 ..... Gas
23-28- 1, Hobough, Junction Oil 1 ..... Gas
1-27- 1, Atterbury, Blackwell D. & R. 1..... Dry
31-38- 1, Peyton, National Union Oil 1..... Dry
30-28- 1, Kuehn, Brown & Vickory 2 ..... Gas

Dry 4
Gas 6
Gas Production 44,000,000

GARFIELD AND NOBLE COUNTIES.

Billings—
15-23- 2, Neil, Humphreys Pet. 4..... Dry

CARTER COUNTY.

Healdton and Fox—
31- 2- 2, Bennett, Kirk Oil 1..... Gas
2- 3- 3, Fee, George W. Chaffee 1 ..... Dry
25- 4- 3, Coffee International Oil 3..... Dry
6- 5S1E Sullivan Spectator Oil 1..... Dry
27- 3- 2, Cullins, American Indian Oil 5..... Gas

Dry 3
Gas 2
Gas Production 33,000,000

WILDCATS.

Pontotoc County—
27- 5- 8, McCall, Kansas City Oil 10 ..... Gas
31- 5- 8, Magnolia Pet. 1..... Dry
Cotton County—
22-1S-10W, Smith, Keys and others 1..... Gas
17- 3-12, J. B. Lawton 1 ..... Dry
McIntosh County—
26- - 5, Estes, H & H. Oil 1..... Dry
Stephens County—
4- 3- 5, Moran, Magnolia Pet. 2..... Dry
1-1S-9W Base Line Oil 1 ..... Dry
Major County—
21-21N-13W, Samuels, Fairview O. & G. 1..... Dry
Caddo County—
10-5N-11W, Feltz, Southwestern Oil 1..... Dry
McIntosh County—
26- 9-16, Jennings, C. B. Shaffer 1 ..... Dry
Cotton County—
3- 2-11, Land, Mistletoe Oil 1..... Dry
17- 3-12, Doran, Evans & Lawton 1..... Dry
25- 4- 3, Sullivan, Guillot & Hall 1..... Dry
22- 1- 5, Sanner, Veldun Oil 1 ..... Gas
Marshall County—
18-7S-7E, Collins, United Oil & Refg. 1..... Dry
Tillman County—
34-1S-15W, Voile, Pulaski Oil 1..... Dry
Greer County—
9-7N-22W, Greater Okla. Dev. 1..... Dry

Dry 14
Gas Wells 3
Gas Production 42,000,000

KANSAS.

SUMMARY OF COMPLETED WELLS.

	Comp.	Prod.	Dry	Gas
Butler	150	43,562	29	5
Chautauqua-Elk	63	899	10	13
Montgomery	50	288	10	12
Wilson	26	170	3	3
Miami-Franklin-Douglas	64	422	9	2
Allen	29	284	0	0

Whatever you do, do wisely, and think of the consequences.—Romanorum.

Neosho	71	987	9	1
Wildcats	40	1,283	17	1
Total	493	47,895	87	27

OKLAHOMA.

SUMMARY OF WELLS COMPLETED.

	Comp.	Prod.	Dry	Gas
Osage	84	3,204	21	5
Washington	36	293	4	2
Nowata-Rogers	75	1,052	7	1
Tulsa	55	1,091	16	8
Okmulgee	132	6,869	27	10
Muskogee-Wagoner-Rogers	63	7,913	18	12
Creek	44	909	15	6
Pawnee	19	555	6	1
Payne	14	595	2	2
Garfield-Noble	20	3,343	3	0
Kay	24	3,550	5	6
Carter	15	375	6	2
Wildcats	43	653	20	3
Total	624	30,402	150	58

KANSAS-OKLAHOMA-ARKANSAS.

SUMMARY OF WELLS COMPLETED.

	Comp.	Prod.	Dry	Gas
Kansas	493	47,895	87	27
Oklahoma	624	30,402	150	58
Arkansas	0	0	0	0
Total	1,117	78,297	237	85

WYOMING.

24-36-85, Brewer, Ohio Oil 2	Dry
18 M. SW, Thermopolis Duncan Oil 1	Dry
12-33-83, Placer Claim, Ohio Oil 2	Gas
Lucern Dome, Satterley Oil 1	Dry
36-48-100, State Land, Ohio Oil 2	Gas
33-46-98, Findlay, Ohio Oil 2	Dry
33-40-79, Bury, Ohio Oil 1	Dry
12-39-79, Castle Rock, Ohio Oil 1	Gas
16-57-98, Gov't Land, D. J. Danker 1	Gas
Dry	5
Gas	4
Gas Production	7,000,000

WYOMING FIELDS.

GENERAL SUMMARY.

	Comp.	Prod.	Dry	Gas
Total July	22	2,865	5	4
Total June	19	3,755	4	2
Difference	3	890	1	2

NORTH TEXAS.

WICHITA AND WILBARGER COUNTIES.

Granger, Texas-Dakota Oil 1	Dry
Overall, Brown et al. 1	Dry
Burnett, Magnolia Petroleum 2-A	Dry
Koehn, The Texas Co. 1	Dry
R. R. Allen, The Texas 65	Dry
Burnett, 6666 Oil Co. 4	Dry
Granger, Brown & Co. 1	Dry
Fee, Waggoner Brothers 1	Dry
Collett, Turner & Co. 2	Dry
Zeiset, Kemp & Kell 1	Dry
Hobson, Burton & Co. 1	Dry
Ward & Todd, O'Conner & Co. 3	Dry
Miller, Lone Star Gas 5	Dry
Prather, Lone Star Gas 1	Dry
Dunn, Prince Co. 1	Dry
Landrum, Metropolitan Oil 2	Dry
McCleman, Shulz & Meyers 1	Dry
Dry	17

BURKBURNETT AND LOCALITY.

Heiserman, Burkburnett and locality	Dry
Serrien, Burkburnett and locality 15	Dry
Weeth, Wichita Falls Fuel & Dev. 2	Dry
Heiserman, Firestone Oil & Gas 1	Dry
Birk, Texas Co. 1	Dry
Kasper, Texas Co. 1	Dry
C. Birk, Fisher & Co. 1	Dry
Basbara, Reese Allen 1	Dry
Heiserman, Heiserman Oil 3	Dry
Hall, Jule Oil 1	Dry
Morris, Sanders & Co. 1	Dry
Fee, Chenoweth Oil 1	Dry
Overall, Brown & Co. 1	Dry
Dry	13

EASTLAND COUNTY.

Cooper, Texas & Pacific Coal 1	Dry
Pitcock, Texas & Pacific Coal 1	Dry
Riddle, Cunningham et al. 1	Dry
Dry	3

STEPHENS COUNTY.

T. M. Corbett, Prairie O. & G. 1	Dry
Wildcats—Young County—	
Lisle, Empire Gas & Fuel 1	Dry
Palo County—	
Watson, Empire Gas & Fuel 1	Dry
McCullough County—	
Crews, Southwestern Petroleum 1	Dry
Dry	3

NORTH TEXAS.

SUMMARY OF COMPLETED WORK

District.	Comp.	Prod.	Dry	Gas
Wichita	40	360	17	0
Burkburnett	49	2,560	13	0
Brown	20	295	0	0
Eastland	10	8,040	3	0
Stephens	3	940	1	0
Wildcats	3	0	3	0
Total	125	12,195	37	0

NORTH LOUISIANA.

CADDO.

12-21-15, Youree, Kinnebrew & Ratcliff 1	Dry
33-22-16, Browning, Savoy Oil 4	Dry
Miscellaneous—	
39-20- 5, Spyker, Mountain & Gulf Oil 1	Gas
36-20- 4, Cole, Central Co. Inc. 2	Gas
33-19- 4, Smith, Nelson Inc. 1	Gas
8-19- 4, Philips, Texas Co. 1	Gas
17-13, Heshelnik, Gulf Refg. 1	Gas
Texas—	
Panola Co., Aaron Jeter, Gulf Prod. 1	Dry
Panola Co., Baker, Hog Bayou O. & G. 1	Dry
Bowie Co., Freeze, Morgan O. & G. 1	Dry
Dry	5
Gas Wells	5

Doing easily what others find difficult is talent; doing what is impossible for talent is genius.—Amiel.

NORTH LOUISIANA.

SUMMARY OF OPERATIONS.

Caddo	42	16,265	2	0
De Soto	0	0	0	0
Red River	0	0	0	0
Bossier	0	0	0	0
Miscellaneous	9	15	3	5
Total	51	16,280	5	5

TEXAS-LOUISIANA.

SUMMARY OF OPERATIONS.

	Comp.	Prod.	Dry	Gas
North Texas	125	12,195	37	0
North Louisiana	51	16,280	5	5
Gulf Coast	151	22,565	76	1
Total	327	51,140	118	6

The National Petroleum War Service Committee, containing heads of the largest oil producing and refining companies in the country, represents the entire industry in mobilizing petroleum resources of the country for winning the war.

Sitting with the Committee is Mr. M. L. Requa, General Director of the Oil Division of the U. S. Fuel Administration. It is through this committee that Mr. Requa is seeking to have the oil industry self-regulating during the period of the war.

1. A. C. Bedford, Chairman, National Petroleum War Service Committee, Board of Directors, Standard Oil Co. of N. J., 26 Broadway, N. Y.
2. Hon. M. L. Requa, Director, Oil Division, U. S. Fuel Administration, Washington, D. C.
3. J. W. VanDyke, President, Atlantic Refining Co., Phila., Pa.
4. Geo. S. Davison, President, Gulf Refining Co., Pittsburgh, Pa .
5. Thomas A. O'Donnell, Director of Production, U. S. Fuel Administration, Washington, D. C.
6. H. L. Doherty, H. L. Doherty Companies, 60 Wall St., N. Y.
7. E. W. Clark, President, Union Oil Co., Los Angeles, Cal.
8. H. E. Fulton, President, Union Tank Line, 21 E. 40th St., N. Y.
9. R. D. Benson, President, Tidewater Oil Co., 11 Broadway, N. Y.
10. E. C. Lufkin, vice Chairman, National Petroleum War Service Committee; President, The Texas Company, 17 Battery Pl., N. Y.
11. Martin Carey, General Counsel, Standard Oil Co. of N. Y., 26 B'way, N. Y.
12. Edward Prizer, President, Vacuum Oil Co., 61 Broadway, N. Y.
13. Samuel Messer, President, Emlenton Refining Co., Emlenton, Pa.
14. J. C. Donnell, President, Ohio Oil Co., Findlay, O.
15. A. G. Maguire, U. S. Fuel Administration, Oil Div., Washington, D. C.
16. W. P. Cowan, President, Standard Oil Co. of Indiana, 910 S. Michigan Ave., Chicago, Ill.
17. H. M. Blackmer, President, Midwest Refining Co., Denver, Colo.
18. J. S. Cosden, President, Cosden & Co., Tulsa, Okla.
19. W. C. Teagle, President, Standard Oil Co. of N. J., 26 Broadway, New York.
20. J. E. O'Neil, President, Prairie Oil & Gas Co., Independence, Kansas.
21. H. F. Sinclair, President, Sinclair Oil & Refining Co., 120 Broadway, N. Y.
22. J. H. Markham, Jr., Tulsa, Okla.
23. Geo. W. Crawford, President, Ohio Fuel Supply Company, 2017 Farmers' Bank Bldg., Pittsburgh, Pa.
24. J. H. Pew, President, Sun Company, Philadelphia, Pa.
25. C. C. Smith, Asst. Sec'y & Treasurer, National Petroleum War Service Committee, 26 Broadway, N. Y.
26. J. A. Moffett, Secretary, National Petroleum War Service Committee, 26 Broadway, N. Y.
27. J. F. Guffey, President, National Gas Association, 435 Sixth Ave., Pittsburgh, Pa.
28. J. H. Barr, President, National Supply Co., Pittsburgh, Pa.
29. Frank Haskell, President, Mid-Continent Oil & Gas Association, Tulsa, Okla.
30. W. S. Farish, President, Gulf Coast Oil Assn., Houston, Texas.
31. N. J. Byrne, President, Connecticut Oil Co., Waterbury, Conn.
32. J. A. Middleton, Oil Division, U. S. Fuel Administration, Washington, D. C.
33. R. L. Welch, Secretary, Western Petroleum Refiners' Association, Finance Bldg., Kansas City, Mo.
34. A. P. Coombe, President, Standard Oil Company of Ohio, Cleveland, Ohio.
35. Ivy Lee, Director of Publicity, National Petroleum War Service Committee, 26 Broadway.

The brave man carves out his own fortune and eve ry man is the son of his own works.—Cervantes.

AROUND THE BELT

New Wells, New Pipe Lines, New Contracts, Additions and Extensions. A Fund of Valuable News Gathered for the Journal Through Many Sources.

MEMORIAL ASSOCIATION ASSEMBLES

THE Drake Memorial Association stands at the monument of the first oil producer in our great community, Col. Edwin L. Drake, who in times way back became the father of the petroleum industry.

It was thought that war needs would not be conflicted with if the regular annual meeting of the association was held, therefore Monarch Park at Oil City, Pa., was selected, and August 27th was the day.

We hope that nothing will at any time prevent the annual meeting of this notable association. In these times when petroleum means everything, one might say to the government, and to the allies, Col. Drake's fatherhood was most appropriately celebrated.

The man who became financially a part of the enterprise that produced the second well was Capt. William Hasson. The Captain spoke at the celebration at Monarch Park. He spoke of the old title of the present Oil City, the spot being known in those early date as the mouth of Oil Creek.

"At one time," said Capt. Hasson, "when I was buying oil, I purchased it as low as 10 cents a barrel. The same grade sold later in Pittsburgh at from $7.00 to $9.00 a barrel." The Captain also referred to having been at a small manufacturing plant on the Kiskiminetas River, where from shale illuminating oil was manufactured prior to the time when petroleum was discovered. The manufacturers were then paying a tax, though small, to the government.

Right here we might interject a protest against the present financial stress that is put on the industry, or is proposed by the government in connection with its financial demands whereby about 60 per cent. of a producer's results go to the government, notwithstanding the fact that he must take 100 per cent. of the risk and of the loss in wildcatting, a point brought to the fore by Henry L. Doherty of the committee just recently appointed by Mr. A. C. Bedford of the Fuel Administration Board.

The following schedule of taxes paid various years to the government by oil producers will be of interest. They were offered by Capt. Hasson in his address:

"The tax on distilled coal oil from September 1, 1862, to May 1, 1871, when the tax bill was repealed, amounted to $112,153.69.

"Products of distilled coal (coal oil) were taxed at a rate averaging from 8c to 20c per gallon.

"The amount received by the Government from refined petroleum from September 1, 1862, to July 20, 1868, was $20,047,110.97.

"From coal oil during that same period $409,411.12.

"From crude petroleum tax of $1 a barrel, March 3, 1865, to July 13, 1866 (16 months), $2,415,687.31.

"Total, $22,872,239.40."

Mr. Edwin C. Bell, Secretary of the Association, and keeper of the museum of the organization offered his minutes upon this occasion, referring to the meeting held in Butler, Pa., last year.

Among the articles in the archives of the Association are lamps of most primitive type, "A collection," Mr. Bell stated, "second only to that in the British Museum." The Association has files of papers which contain an everyday running account of the Civil War, and a continued history of the oil business from the early days. What oil man will come forward and endow the association?

TRADE PERSONALS

DRAKE, LAUREN J., Vice-President of the Standard Oil Company of Indiana, was recently elected President of the company in that state, succeeding W. P. Cowan, lately deceased.

ERICKSON, HALFORD, formerly of Hagenah & Erickson, Chicago, recently was elected Vice-President of the Louisville Gas & Electric Company, Louisville, Ky.

FISHER, J. G., Superintendent of the Drumright division of the Oklahoma Gas & Electric Company, has joined the United States Army, and is now in training at Camp Pike, Ark.

HALL, W. B., has been elected President of the Meadow Creek Oil & Gas Company, Winchester, Ky.

MISER, W. B., formerly Manager of the Drumright division of the Oklahoma Gas & Electric Co., has received a commission as Captain in the Engineers Corps of the United States Army and will leave shortly for one of the cantonments.

OWENS, J. F., Vice-President and General Manager of the Oklahoma Gas & Electric Company, recently addressed the Enid, Okla., Rotary Club on the subject "What Can Be Done To Aid the Returning Soldier After the War."

REED, MISS ANNA, is employed by the Empire Pipeline Company of Arkansas City, Ark., as an oil gauger. It is believed that Miss Reed is the first woman in the United States to hold a position of this description.

ROGERS, CHARLES M., results engineer for the Southern district of the Doherty Organization for a number of years, has joined the Government dollar-a-year brigade. He will have the title of fuel oil engineer of the Gulf Coast district, with headquarters in New Orleans.

VAUGHN, NORMAN M., formerly of Saint Louis, Mo., has recently moved to Oklahoma City, Okla., to assume active duties as First Vice-President of the Sammies Oil Corporation, of that city.

WINNINGHAM, C. C., of Detroit, has been appointed chief of the gasoline section and director of publicity of the Oil Division of the United States Fuel Administration.

Men's weaknesses are often necessary to the purposes of life.—Maeterlinck.

DECEASED

CAREY, JAMES H., aged 73 years, manager of the right-of-way department of the People's Gas Co., died at his home in Pittsburgh, Pa., August 30.

INCORPORATED

DELAWARE—Wilmington

The Torrent Oil & Gas Corporation has been organized under the laws of this state with a capital stock of $1,000,000. Among those interested are John C. Draper, C. L. Rimlinger, M. M. Clancy.

OKLAHOMA—Custer City

The Burkburnett Oil & Gas Company has been incorporated with a capital stock of $100,000. The company will also have headquarters at Wichita Falls, Tex.

Oklahoma City

The officers of the Sammies Oil Corporation recently formed are: John W. Choate, President; Norman M. Vaughan, 1st Vice-President; H. B. Houghton, 2nd Vice-President; Al G. Patterson, Treasurer, and Paul M. Pope, Secretary and Counselor.

PER CUBIC FOOT—RATES

INDIANA—Rushville

The People's Natural Gas Company has been authorized to increase its rates to 40 cents per thousand.

KANSAS—Leavenworth

The Leavenworth Light, Heat & Power Company has announced an increase in its gas rate, which will bring the price up to $1.00 per housand.

NEW YORK—Le Roy

The Le Roy town board has denied the request of the Tri-County Gas Company, of Caledonia, to have certain terms of its franchise in the town of Le Roy changed. The company desired to make a service charge of 50 cents a month to each consumer regardless of the amount of gas consumed and to raise its rate from 45 to 60 cents per thousand. .

The Caledonia company is authorized to make a service charge of 50 cents a month to all consumers using less than 3,000 feet of gas per month, but in case the consumer uses more than 3,000 feet per month, the service charge must be merged in the price for the gas at the regular rate.

The company serves about fifty customers in Le Roy, outside the village.

OHIO—Springfield

The Central Ohio Fuel Company has put in force a rate of 35 cents per thousand for the first two years and 40 cents per thousand for the following three years, of its contract which will cover a period of five years.

Wapakoneta

The Wapakoneta Natural Gas Company has increased its rates from 3 cents to 50 cents per thousand.

OKLAHOMA—Blackwell

The Blackwell Oil & Gas Company has filed application for an advance in gas furnished for manufacturing purposes in this field.

PENNSYLVANIA—Tarentum

The T. W. Phillips Gas & Oil Co. has filed with the Public Service Commission of Pennsylvania a schedule of rates effective after the September meter reading which advances the price of gas to domestic consumers from 30 cents per thousand cubic feet, subject to a discount of 2½ cents per thousand cubic feet, to 37c per thousand cubic feet, subject to a discount of 2c per thousand cubic feet, and thereafter a readiness to serve charge of 25c per month will be made and the minimum rate will be discontinued.

GENERAL

COLORADO—Denver

To keep in touch with the industrial requirements of the state, two special courses have been added to the curriculum of the Colorado School of Mines.

Prof. C. W. Botkin, recently added to the faculty from Wheaton college, Illinois, is in charge of a course in oil shales, with special reference to the valuable material already located in the Debeque and Grand Valley districts of western Colorado. This course will include a study of the distillation of oil from shales and of the approved refining methods for shale oil and petroleum. In the new laboratory now being fitted up, oil shales will be analyzed for yield of oil per ton and for ammonium sulphates, a valuable by-produce.

DISTRICT OF COLUMBIA—Washington

It is estimated that nearly eight million gallons of gasoline will be saved each Sunday through non-use of motor vehicles on those days, as requested by Administrator Garfield. East of the Mississippi there are approximately four million motor-driven vehicles. Of these, 200,000 are trucks to which the restrictions do not apply. The estimated saving is based on the use of the average two gallons of gasoline for each car of the 3,800,000 cars affected.

ILLINOIS—Campbell Hill

Four wells have been drilled in recently in a new field which is located about one mile from town. Three of these are good gas producers, while the last of the four completed on the Downen farm, came in dry.

The vocation of every man and woman is to serve other people.—Tolstoi.

...DIANA Pendleton

...mond

...SAS El Dorado

...Scott

...gomery County

...County

...KY—Winchester

...ISIANA Bastrop

Bastrop

...Parish

...use

...Parish

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No man can climb out beyond the limitations of his own character. Morley

Carter County

The Humble-Fox Oil Company has a 15,000,000-foot gasser in No. 1 on the Lester farm in the northwest corner of Section 35-2s-3w from sand at 1,045 feet.

Comanche

The Comanche Petroleum Company has a 30,000,000-foot gasser on the Laura Wilson farm, north of this place. The gas was struck at 1286 feet.

Creek County

Wilson and others' No. 1 on the Yen Con Tab Lahney farm in the southwest corner of Section 4-16-10, is good for 4,000,000 feet of gas and 20 bbls. of oil.

The Wiser Oil Company's No. 5 Pickett in the southwest corner of the northwest quarter fo Section 10-16-11 is making 1,000,000 feet of gas at 1,375 feet.

Cushing

The C. B. Shaffer well on the Brown farm in the northwest corner of Section 24-18-7, which was reported as a 12,000,000-foot well has increased its gas showing to 18,000,000 feet.

Glenn Pool

The Minnehoma Oil Company's No. test on the Daze farm in Section 27-17-12 is reported good for 12,000,000 feet.

Kay County

The Sammies Oil Corporation is drilling in Section 22-27-3.

Lincoln County

The Higher Oil Company's No. 2 on the Alexander farm, Section 26-28-1w, was drilled to 1,100 feet and plugged back to sand at 985-1,000 feet, where a 3,000,000-foot gas production had been found.

Muskogee

A 15,000,000-foot well of the Okmulgee Producing & Refining Company in Section 17-13-12 was ignited during an electric storm recently, and caused great loss of gas for some days. A battery of steam boilers was finally brought up, and by this means the fire was smothered.

Oklahoma City

A canteen hut has been built at the Santa Fe station for the use of the Canteen Unit of the Red Cross, serving lunches and drinks to the soldiers who pass through the city. Every troop train is met and the soldiers' wants supplied. The Oklahoma Gas & Electric Company furnishes the gas and electric service gratis.

Okmulgee

The Kingwood Oil Company's No. 3 on the Monday farm, in Section 19-13-14, is an 8,000,000-foot gasser in sand at 1,681-91 feet.

Okmulgee County

The Producers & Refiners Corporation's No. 2 on the Nancy Sewall farm, in Section 2-13-11, about a mile southwest of the edge of the Youngstown pool, is on top of the sand at 2,407 feet, showing 90 bbls. of dark oil and 5,000,000 feet of gas.

Payne County

The Creek County Gas Company's No. 1 on the Ellis farm in the northeast corner of the southwest quarter of Section 3-18-5, is shut down with 5,000,000 feet of gas showing in sand at 1,308-28 feet.

Stephen County

The Eagle Falls Oil Company has a 5,000,000-foot gasser in its No. 1 on the Harper farm in Section 23-2s--5w in sand at 390 to 527 feet.

Cotton County

The Magnolia Petroleum Company has 10,000,000 cubic feet of gas in its initial test on the Bickett farm, in Section 24-1s-10w, in sand at 2,145 to 2,156 feet.

Stephens County

The Simpson Oil Company has a 1,000,000-foot gasser on the Martin farm in Section 36-1s-5w.

The Comanche Oil Company's No. 1 in Section 20-2s-7w, is making 5,000,000 feet of gas from sand at 1,282-90 feet.

OHIO—Cincinnati

A loan of $2,000,000 will be extended by the United States Government to the Union Gas & Electric Company for the erection of a third unit at the company's new generating plant. The period of the loan is five years.

Columbus

The Columbus Gas & Fuel Company and the Federal Gas & Fuel Company subsidiaries of the Ohio Cities Gas Company are now installed in the eight-story office building, which has been remodeled for their use, and handsomely fitted up.

The Ohio Gas & Oil Men's Association, recently organized, has opened offices in the New First National Bank Building. W. H. Thompson, Secretary, is in charge. It is desired to include in the membership of the Association every man in the state who is connected with the industry. Farmers whose property is leased to developing interests are also eligible to membership.

Coshocton

In Newcastle Township the Logan Fuel & Gas Company drilled a fair gas well in a test on the C. E. Lawrence farm.

Cuyahoga County

In Dover Township, the East Ohio Gas Company drilled a fair gas well in a test on the H. Airing farm.

In Dover Township the Logan Gas & Fuel Company drilled a good well on the H. E. Mallie farm.

Holmes County

In Washington Township the Logan Gas & Fuel Company drilled a gas well on the Edward Weimer farm, Section 14, and is drilling on the northwest corner of the Ora Smeltzer farm, Section 10.

Lorain County

In Aven Township the Logan Gas & Fuel Company drilled a fair gas well in a test on the Isaac Chester farm, Section 21.

Richland County

In Monroe Township the Logan Gas & Fuel Company is drilling on the W. E. Applegate farm.

In Worthington Township the Logan Gas & Fuel Company drilled a good well in No. 3 on the Smith-

It is not permitted to the most equitable of men to be a judge in his own cause.—Pascal.

EVERYTHING FOR OIL AND GAS WELLS

"OILWELL" ESTD. 1862 TRADE MARK (REGISTERED)

BRANCH STORES IN ALL OIL FIELDS

"OILWELL" DURABILITY

Durability:- lastingness—the power of uninterrupted or long continuance in any condition. *Webster's Dictionary.*

"Oilwell" Engine with a record of 34 years constant service.

Established when oil was first discovered in America, "Oil" and "Oilwell" have grown up **together**, and the illustration above shows the **DURABILITY** of our products. This engine was **built at** our Oil City Works in the early eighties and has been in constant use for 34 years.

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PUBLISHER'S NOTICE

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CONTENTS OF THIS ISSUE

INDEX OF PAST 1918 ISSUES

INDEX OF PAST 1918 ISSUES—Continued

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Continental Supply Co., St. Louis.
Cooper, C. & G Co., Mt. Vernon, O.
Crandall-Pettee Co., New York City.
Cutler Hammer Mfg. Co., The Milwaukee.

Davis-Bournonville Co., Jersey City.
Dayton Pipe Coupling Co., Dayton.
Davison, N. C., Gas Burner & Weld'g Co., Pittsburgh.
Domestic Engineering Co., Dayton, O.
Draeger Oxygen Apparatus Co., Pittsburgh.
Dresser, S. R., Mfg. Co., Bradford, Pa.

Equitable Meter Co., Pittsburgh.
Estate Stove Co., Hamilton, O.

Fitler, Edwin H. Co., Philadelphia, Pa.
Foxboro Co. The, Foxboro, Mass.
Franklin Co. The, Canton, O.
Frick & Lindsay Co., Pittsburgh.
Fuel Oil Journal, Houston, Texas.

Garlock Packing Co., Palmyra, N. Y.
Gas Age, The, New York City.
Gas Appliance Co., Cleveland.
Gas Record, Chicago.
General Fire Ext'g'r Co., Providence.
General Gas Light Co., Kalamazoo.
Germer Stove Co., Erie.
Gilfillan Machine Works, Ebenezer, N. Y.
Goodrich, B. F. Co., Akron, O.
Graves Supply Co., Cincinnati.
Guardian Gas Appliance Co., The, Cleveland, Ohio.
Gwynn Gas Burner & Eng. Co., Pittsburgh.

Hammon Coupler Co., Pittsburgh.
Haymond Co., Muncie, Ind.
Hays Mfg. Co., Erie.
Hart Mfg. Co., Cleveland.
Hazard Mfg. Co., Chicago.
Heeter, C. M. Sons & Co., Inc., Butler, Pa.
Hewitt Rubber Co., Pittsburgh.
Hooven, Owens, Rentschler Co. Hamilton O.
Hope Engineering & Supply Co. Pittsburgh.

Ideal Heating Co., The, Columbus.
Imperial Belting Co., Chicago, Ill.
Ingersoll-Rand Co., Pittsburgh.
International Hale Gas Mixer Company. Providence.
Iroquois Natural Gas Co., Buffalo, N. Y.

Jarecki Mfg. Co., Erie.
Jiffy Water Heater Co., St. Louis.
Jones & Laughlin Steel Co., Pittsburg, Pa.

LaBelle Iron Works, Steubenville, O.
Lattimer-Stevens Co., Columbus, Ohio.
Leschen, A. & Sons Rope Co., St. Louis.
Lezius Automatic Draft Reg. Co., Cleveland.
Lucey Mfg. Corp., Pittsburgh.
Ludlow Valve Mfg. Co., Pittsburgh.

Macomber & Whyte Rope Co., Chicago.
Manhattan Rubber Mfg. Co., Passaic, N. J.
Mark Mfg. Co., Chicago.
Maxon Premix Burner Co., Muncie, Ind.
Meek Oven Mfg. Co., Newburyport, Mass.
Metric Metal Works, Erie.
Minneapolis Heat Reg. Co., Minneapolis.
Modern Iron Wks., Quincy, Ill.
Modern Safety Iron Co., Philadelphia.
Moon Mfg. Co., The, Chicago.
Moore, Lee C. & Co., Inc., Pittsburgh.
Moser Mfg. Co., Kane, Pa.
Mueller H. Mfg. Co., Decatur, Ill.

Nathan Mfg. Co., New York City.
National Supply Co., Pittsburgh.
National Transit Pump & Mach. Co., Oil City, Pa.
National Tube Co., Pittsburgh.
Natural Gas & Gasoline Journal, Buffalo.
New Bedford Cordage Co., New York City.
New York Belt'g & Pack'g Co., New York.
Nye, A. T. & Son Co., Marietta, O.

Oil & Gas Journal, Tulsa, Okla.
Oil City Boiler Wks., Oil City, Pa.
Oil Trade Journal, New York.
Oil Well Supply Co., Pittsburgh.
Oxweld Acetylene Co., Chicago.

Parkersburg Mach. Co., Parkersburg, W.Va.
Parkersburg Rig & Reel Co., Parkersburg, W. Va.
Peerless Heater Co., Pittsburgh.
Pennsylvania Furnace & Stove Co., Warren, Pa.
Pittsburg Meter Co., East Pittsburg.
Pittsburg Reinforced Brazing & Mach. Co., Pittsburgh.
Pittsburg Valve & Fittings Co., Pittsburgh.
Pittsburg Valve, F'd'y & Const. Co., Pittsburgh.
Pittsburgh Water Htr. Co., Pittsburgh.
Plymouth Cordage Co., N. Plymouth, Mass
Pratt & Cady Co., Inc., New York City.
Prichard Supply Co., Mannington, W. Va.

Rathbun-Jones Eng. Co., Toledo.
Reid, Jos. Gas Engine Co., Oil City, Pa.
Reliable Stove Co., Cleveland.
Republic Iron & Steel Co., Youngstown, O.
Revere Rubber Co., Chelsea, Mass.
Reznor Mfg. Co., Ltd., Mercer, Pa.
Riesenman Mfg. Co., Ltd., Franklin, Pa.
Robinson, J. E. & Co., Oil City, Pa.
Robinson Packer & Mach. Co., Coffeyville, Kansas.
Roebling, John A. Sons Co., Trenton, N. J.
Rossendale-Reddaway Belt'g & Hose Co., Newark, N. J.
Ruud Mfg. Co., Pittsburgh.

Sanitary Co. of America, Linfield, Pa.
Schaeffer & Budenberg Mfg. Co., Pittsburgh.
Scientific Heater Co., The, Cleveland, Ohio.
Selas Co., Canton, O.
Solar Light Co., New York City.
South Chester Tube, Chester, Pa.
Spang, Chalfant & Co., Pittsburgh.
Sprague Meter Co., Bridgeport, Conn.
Strause Gas Iron Co., Philadelphia.
Superior Gas Engine Co., Springfield, O.

Tate-Jones & Co., Inc., Pittsburgh.
Taylor, W. P. Co., Buffalo.
Toledo Pipe Thr'd'g Mach. Co., Toledo, O.
Troop Mfg. Co., Pittsburgh.

United Seal Co., Columbus.
Utica Valve & Fixture Co., Utica, N. Y.

Welsbach Co., Gloucester City, N. J.
Westinghouse Mach. Co., Pittsburgh.
Westinghouse Electric & Mfg. Co., Pittsburgh.
Wheeling Steel & Iron Co., Wheeling.
Wolfe, Linden W., Oil City, Pa.
Worthington Pump & Mach. Corp., Buffalo.
Wright Wire Co., Worcester, Mass.

Youngstown Sheet & Tube Co., Youngstown, O.

MAKING ONE HAND WASH THE OTHER.

A Practical War-time Measure Based Upon the Motto, "In Time of War, Prepare for Peace."

NOT only in the thousands of other lines of industries, but in the gas industry of the United States the leading manufacturing concerns are making in some instances as high as 90 per cent. war materials. These concerns are earning first-class returns, and are receiving full compensation, not only, but in many instances especially liberal compensation for the work performed.

This means a steady, excellent income assured and guaranteed during the war by the best financial institution in the world, namely, the United States Government.

It requires no credit man to pass upon a thousand and one concerns and hundreds of orders coming in after a scattering fashion from all parts of the United States. In other words, it puts the manufacturer on "easy street" with his bookkeeping force, simply charging up the items of the day to the proper accounts, without any charging off either of a quarter of one per cent. or a half of one per cent., or whatever the ordinary losses may be.

A reasonable percentage of this income it is the moral duty of the manufacturer to invest for the future towards holding and for the preliminary building up of his established business *that must be maintained,* or he will be down-and-out after the war when his "easy street' contract ceases. The time when he will have to get back to the unremitting hammering for business.

Now is the time for the manufacturer to *"make the one hand wash the other,"* using, as we have said, a percentage of his present income to hold and to build up the business that he has spent thousands upon thousands of dollars to accumulate, and that is on the ragged edge of being dissipated if he does not NOW hold by active work, even though attempting to secure no orders.

We know for a fact from an address by the reliable Val Fisher, a member of the Chamber of Commerce of London, England, that:

> *"British manufacturers who have not a dollar's worth of merchandise to sell, whose entire plants are employed on government work, are keeping their advertising continuously before the public, because while they are perfectly willing to turn their profits over to the government, while they are perfectly willing for the sake of winning the war to have their factories commandeered and their normal business completely stopped, yet they are not willing to sacrifice their good-will; they are not willing to have their names or their products forgotten."*

Will our manufacturers in the gas-field of the United States *insure* their good will, *insure* the business they have already built in this field, and *insure* their ability to hold together their valuable organizations, and to hold intact their old line of customers? This may be done through the use of their traveling representatives, and of their advertising spaces in the magazines of the field. Or will they forget the good example of the English manufacturers surrounded by active warfare for a much greater period than have we been in the United States, and who, if any manufacturers would have reason to cease their activities, would most certainly be in the front rank.

Lucius L. Bigelow

FROM THE EDITORIAL MAIL BAG

INSURING BUSINESS.

WE insure our persons against accident and against illness. We insure our properties against fire, our household effects against theft, etc., etc., yet we do not know positively that we shall be injured, nor do we know positively that we shall be sick. We do not know positively that our property will burn, nor do we know positively that robbers will take our household effects, yet knowing that we are gambling, we call it "insuring," we willingly pay the premium in each instance.

There is a greater danger menacing business houses today than the menace to our persons and our business through accidents, illness, fire or theft. It is the menace of *losing one's business, losing one's business-good-will,* and all of the investment that one has for years put into his business.

Thousands of concerns have taken on large war orders. This is perfectly right, but unfortunately, simply because the outlet for their *staple articles* is not what it was, they cease in many instances practically all activities through traveling representatives, advertising, etc., a most direct way to the losing of their *staple business, their prestige and their business-good-will.*

Out of the funds brought in to the coffers of manufacturing concerns through the executing of war orders, nothing could be more directly in line with "safety first," and with the idea of conserving that which one has developed, namely, good-will, patrons, etc., than the taking of some of the funds paid by the government on war orders, and converting these funds into "premiums," paid through retaining traveling representatives, sending them out occasionally, thus to keep in touch personally with certain of the larger trade, and through advertising, with a view to keeping the name of the institution and its line of manufactures constantly before those who will, with the close of the war, *be needed most emphatically as outlets for staple products,* when war orders are trimmed or are entirely countermanded.

We have heard it rumored that a request was recently made that manufacturers should not advertise, and that they should cut off their traveling men. Such a policy is directly in opposition to an expressed desire on the part of the Administration, which is to the effect that manufacturing interests should use every endeavor, including advertising to hold and remain in touch with their former customers, and to pave the way for the forming of new sales relations with those who will come upon the horizon as new buyers, at the close of the war.

There is an old saying, "Penny wise, pound foolish." Let us ask the question, is it wise to fail of taking a reasonable percentage of the income from war orders to insure a manufacturer keeping in touch with the trade that he ***must depend upon*** when war orders cease?

GAS VERSUS COAL.

IN order to accomplish a full appreciation on the part of our readers, of what the loss is in the use of coal for domestic purposes, we recently wrote to the United States Fuel Administration for certain data. The following is received in reply:

"If anthracite is used, free nitrogen, carbon monoxide and carbon dioxide are the most prevalent gases. The greater amount of carbon dioxide present, the more perfect the combustion. Heat losses, and certainly coal waste, range as follows in the ordinary household heater. This perhaps is best explained in a simile: The poor fireman purchases ten tons of coal, which cost at least $100. Of this, $25 or 2½ tons, goes to heat his house; $20 or 2 tons are lost because his heater and pipes are not covered with asbestos or similar insulating material; $40 or 4 tons are lost because he either does not have proper dampers in his smoke-pipe or does not properly use them if he has them; $5 or ½ ton is lost because in shaking the fire he allows live coals to fall into the ash pit; $10 or 1 ton is lost because his chimney and heater flues are full of soot.

"This perhaps will bring out most clearly the big waste in the poorly fired heater. We are sorry to say that this is the usual condition among householders. The largest waste, as you will note from the above, is through the loss of volatile gases through the smoke-pipe. In the properly fired heater this loss should not exceed fifteen per cent.; in most cases it is nearly forty per cent."

Compare the foregoing with the 100% efficiency in gas, in view of the fact that the instant the gas is lighted in a cooking or heating appliance, it is as intensely hot as ten minutes, half hour, or an hour later; the 100% efficiency mark comes with the applying of the match or lighter to the gas.

Then keep in mind the immense economy accomplished through ability to turn down gas after the cooking has gotten under way, or when the room has become sufficiently warm so that a percentage of the heat will naturally be retained within the confines of the room. Then let us keep in mind the fact that we have 100% economy, with the turning out of the gas, in view of the fact that instantly all burning of fuel ceases and wastage is at zero, in other words, does not exist.

Even with a thorough understanding of firing with coal, and with all the economies that may be practiced, the loss in domestic firing remains vastly greater than with gas, and the wastage with gas even further diminishes, where careful, thoughtful economizing of gas is employed.

There should be no question on the part of the Fuel Administration when it comes to the matter of doing everything not simply within reason, but let us say, ***within the bounds of possibility*** to provide the gas companies with coal, not only in sufficient quantities to meet ordin-

Nature admits no lie.—Carlyle.

ary requirements, but in quantities sufficient to meet the needs of war-time stress.

We should not let up one minute in our endeavor to impress upon the Fuel Administration the enormous gain possible through its advocating the use of gas to a vastly increased extent, versus the use of coal for domestic purposes.

TEXAS ASSOCIATION.

THE Texas Gas Association which is affiliated with the American Gas Institute, held its Third Annual Meeting at Fort Worth, Texas, September 10th and 11th. Pep and excellent attendance tells a part of the story of a successful meeting.

The day following the gathering, was National registration day, yet notwithstanding this fact, and the natural outcome which was that the minds of many of the men were fixed upon what might be the personal outcome of their registering for army service, close attention was given to the work of the convention.

President F. J. Storm presided, while our friend O. K. Shannon, Chairman of the Arrangements Committee, carried out his part of the program to the gratification of all present. There was a tour to Camp Bowie and the Carruthers Field, a most interesting feature.

The members had an opportunity to visit actual trenches and barbed wire entanglements, dugouts, etc., an experience that was certainly worth while.

Another of the entertainment features was a ride on the Lake Worth, the largest body of water in the State of Texas. A visit was paid to Moslah Mosque, the new Masonic Temple, built by the Masons of Fort Worth. The Mosque is a spacious and exceedingly attractive institution.

The entertainment features were all complimentary, the funds whereby to accomplish the pleasures of the day were supplied by the Fort Worth Gas Company and the Lone Star Gas Company, while the Street Railway Company, with its compliments, supplied special transportation to Lake Worth. Thanks were extended to these three concerns and as well to Mr. Shannon for his splendid work in arranging and conducting the entertainment features.

The officers elected were as follows:

W. H. Sedberry, President, Marshall, Texas; P. E. Nicholls, First Vice-President, Galveston, Texas; C. B. McKinney, Second Vice-President, Denison, Texas; C. H. Seidenglanz, Secretary-Treasurer, Dallas, Texas, re-elected.

Mr. F. J. Storm, immediate Past President, automatically becomes the Association's representative to the American Gas Institute.

Two new Directors elected were: O. K. Shannon, Fort Worth; F. L. Weisser, San Antonio.

A. T. Knies, Austin and J. S. Connelly, Atlanta, have another year to serve.

Houston was selected as the next meeting place, October 16-17, 1919—Bender Hotel.

The proposition submitted by the Southwestern Electrical & Gas Association that members of the Texas Association join their Association was respectfully declined by a unanimous vote, as it was the concensus of opinion that the gas-men will receive more benefit from attendance at a convention of gas-men only, than one of a mixed nature which naturally tends to divide interest.

The selecting of Mr. W. H. Sedberry as President of the Association may be taken as a statement right at the beginning of the new year, that the Association will show-up in fine shape when the next meeting occurs at Houston, Texas, and surely no better Secretary-Treasurer could have been chosen than Mr. C. H. Seidenglanz, of Dallas, who has shown his ability in his handling of affairs during the already period of his holding office.

The President's address was listened to with intense interest as were all the papers read.

The paper by Mr. S. M. Darling, Fuel Engineer, Bu-Gas Industry in the State of Texas," was of course, the big feature as it dealt with conditions right at home. The discussion was resumed at the afternoon session.

It was regretted exceedingly that at the last moment Mr. W. Chaplin Robinson of the U. S. Fuel Administration found it impossible to attend. This was due to illness; the same applied to Mr. P. E. Nichols, who had recently undergone an operation.

The paper by Mr. Walker, entitled, "Condition of the reau of Mines, Washington, D. C., was in the nature of a letter to Mr. Storm which was to have been supplemented by other data on carbonizing and briquetting of lignite; this was to have been forwarded by the Government of the Province of Saskatchewan. The additional data did not arrive before adjournment.

A resolution endorsing the Fourth Liberty Loan and pledging the united support of the Association to the winning the war, was unanimously adopted.

The "Round Table Talks," a new feature tried out at this meeting, proved very successful; the members entered into these discussions most freely and told of incidents and experiences that would not otherwise have been brought out. A number of the members expressed themselves as having profited by these informal talks. Some of the subjects developed at these "Round Table Talks" were:

"The Labor Situation."

"Separation of Oil from Gasoline Vapors when Under a vacuum."

"What Legal Action, if any, is Taken by Gas Companies against Theft of Gas."

"Women as Gas Fitters and Meter Readers."

"Gas vs. Gasoline in Commercial (wholesale) Peanut Roasting."

"Efficient Gas Combustion."

Help the terrified civilian population now under the heel of the Hun. Buy War Savings Stamps for a quick victory.

There is endless merit in a man's knowing when to have done.—Carlyle.

CONCENTRATED CONSERVATION

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ELECTRIC WELDING

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U S INDUSTRY AND THE WAR

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And all may do what has by man been done Young

VALUABLE PUBLICATIONS

TWO works that should be in the working library of those whose interests touch upon any of the many ramifications of geology, are "Economic Geology," by Heinrich Ries, Professor of Economic Geology in Cornell University, now in its fourth edition, and "Engineering Geology," by Heinrich Ries and Thomas L. Watson, Professor of Economic Geology in the University of Virginia, and State Geologist of Virginia, a second enlarged, edition.

"Economic Geology" contains close to four hundred illustrations, and is divided into two parts, the first of which deals with non-metallics, the second with ore deposits. An excellent chapter on petroleum, natural gas, and other hydrocarbons is found in the contents.

"Engineering Geology" is a volume of 722 pages, and contains 249 figures in the text and 104 plates. The chapters, numbering eighteen, bear such captions as The Rock-Forming Minerals; Rocks, Their General Character, Mode of Occurrence and Origin; Structural Features and Metamorphism of Rocks; Rock-Weathering and Soils; Surface Waters; Underground Waters; Petroleum, Natural Gas and Other Hydrocarbons, etc., etc., each chapter having many subdivisions.

John Wiley & Sons, Inc., of New York, are the publishers of these two volumes.

Another book of great value to geologists and those interested in the study of geology has been issued by these publishers. This is the "Textbook of Geology" by Louis V. Pirsson, Professor of Physical Geology in Sheffield Scientific School of Yale University, and Charles Schuchert, Professor of Paleontology and of Historical Geology in the same university.

Professor Pirsson's contribution to the work is Part I which is devoted to Physical Geology, while Professor Schuchert's contribution is Part II, covering the historical side.

The volume is profusely illustrated with excellent reproductions of photographic studies, and reproductions of line drawings. The subject allotted to each of the collaborators is handled in a splendidly clear and concise manner, and after a fashion to interest the lay reader as well as one who has made geology his profession.

A WAR TIME MEASURE.

Charles Dillingham, head and front of the New York Hippodrome, is giving the soldiers and sailors who frequent the city, the people of New York, and those visiting the metropolis on business, an opportunity to see and think about such a variety of things, not simply those that portray fighting, as is done in many of the plays of the day, and many of the books now being published, but the comedy side, the beauty side, and the novelty side of things, just what people need in these days of stress.

"Everything" the title of that which is being produced at the Hippodrome, and the name, by-the-way, is a most clever one, as it is descriptive to a high degree of what takes place, should be seen by *everyone.*

The rates at the Hippodrome are such that it is not difficult for almost anyone to see this wonderful production.

The Central Liberty Loan Committee has authorized the New York Hippodrome to fly the 100% Fourth Liberty Loan Banner. This means that everyone of the 1,074 employes of the Hippodrome has subscribed for at least one bond of the latest issue, and during a recent week the subscriptions taken at the Hippodrome performances passed the $500,000 mark.

We have stated these facts regarding the Hippodrome's part in backing the Government, that it might be understood that Mr. Dillingham is providing a marvelous means whereby to gather in vast sums in support of the government. The box office receipts include the means by which to meet the enormous pay roll, an excellent percentage of which is going right on through the channels to buy Liberty Bonds.

NEW PUBLICATIONS WEST VIRGINIA GEOLOGICAL SURVEY.

There have just been issued two very important and interesting publications by the West Virginia Geological Survey, Morgantown, W. Va. These publications are described in the following extract from the printed circular of the Survey:.

Detailed Report on Barbour and Upshur Counties and Western Randolph, by D. B. Reger, with an Introductory Discussion of Deep Well Temperatures by C. E. Van Orstrand, issued under date of July 1st, 1918, containing 867 pages + CIV pages of introductory matter, and illustrated with 52 half-tone plates and 43 figures or zinc etchings in the text, accompanied with a separate case of topographic and geologic maps of the entire area in two sheets, one covering Barbour County, and the other Upshur County and the coal area of Randolph west from Big Laurel and Rich Mountains. The whole region is underlain by the Coal Measures in which are several valuable beds, all of which are described, analyzed, and their areas mapped in this Report.

Revised Figure Showing Bituminous Coal Beds in West Virginia, zincograph section, or cut, 6 inches wide and 40 inches long, showing the names, number and intervals separating the Coal beds of West Virginia, and extending from the top of the Dunkark Series to the basis of the Pottsville Series, on the scale of 1 inch to 200 feet, compiled and revised to July 1, 1918, by Ray V. Hennen, Assistant Geologist.

The extra topographic and geologic maps and also the Revised Section of the Coal Measures are now ready for delivery, while the volume on Barbour, Upshur and Western Randolph with its accompanying case of topographic and geologic maps is expected from the press shortly.

That life is long which answers life's great end.—Young.

Auxiliary Appliances

"Auxiliary or Dual Installments for Domestic and Industrial Consumers" —A Paper Dealing With a Problem in the Natural Gas Field that Grows Yearly in Seriousness — Also Discussion.

BY KARL EMMERLING.

THE price and shortage of coal during the winter of 1917-1918 caused an unprecedented demand for natural gas for heating purposes. This demand was such that most companies producing and distributing natural gas found it impossible to supply an adequate quantity to care for all domestic heating requirements, although every company did its utmost. According to all competent authorities neither the coal nor gas situations will be improved any this coming winter.

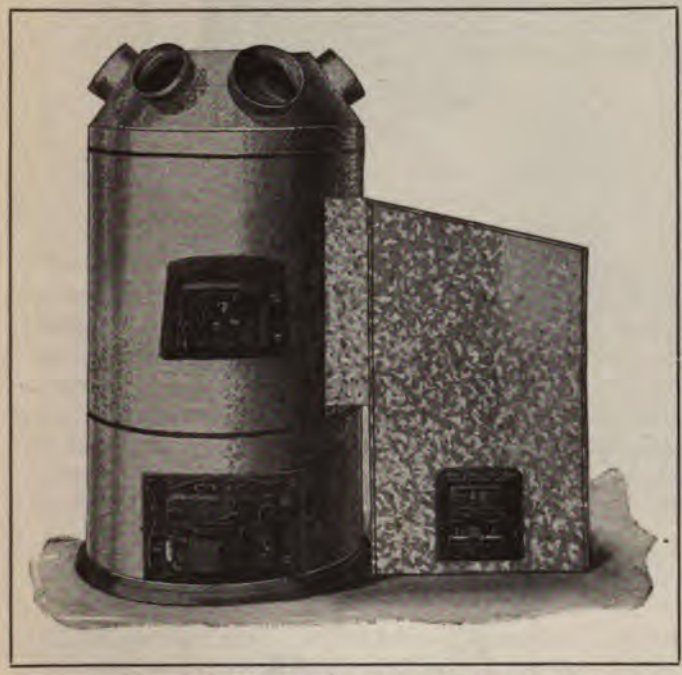


FIG. 1. AUXILIARY GAS FURNACE SQUARE, Gas Appliance Company.

The situation from both the gas company's and the consumer's point of view is very serious, and steps should be taken to remedy it. Another co-related feature of importance is this—that the normal domestic peak load which now perplexes many natural gas companies in winter, and sooner or later will prove a thorn in the sides of all, is directly responsible for the lowering of domestic pressures to a point which has led to the public dissatisfaction, now very outspoken in various communities, and the demands which are being made for the establishing of impossible pressure standards. It has been suggested in some quarters that the curtailment of the present volume of domestic consumption might be effected, and that the substitution of a more continuous, well-defined volume of industrial consumption can be effected. But against this we have the unanimous pronouncements of the consuming public that preferential service be given to domestic consumers, and in this, generally speaking, the gas companies have not only concurred, but made their industrial contracts subservient to domestic consumption. Since this seems to be a settled policy, it would appear that the only logical thing for natural gas companies to do is to set about to alleviate the burdensomeness of domestic peak load requirements in extreme winter weather and surely no one element will so quickly relieve the excessive drain upon their supply during such periods than to have a substantial percentage of their largest domestic users of gas ready to discontinue its use immediately, whenever necessary.

Some companies are more fortunate than others in their source of gas supply and the quality of their service is not lowered to any great degree in the cold weather, whereas other companies have from one to thirty days of low pressure trouble, and have as a result, much trouble in keeping their consumers satisfied. This is largely the result of lack of knowledge on the part of consumers, of the general conditions surrounding the production of gas. Whether this is because of inactivity on the part of the gas companies in placing the matter before the consumers, or the inability heretofore to interest the consumers in facts of this kind, is an open question, but the fact remains that most consumers of natural gas believe that these shortage conditions could be relieved by the turning on of more wells, the drilling of additional wells, or the tapping of additional reservoirs, not realizing that the gas companies have for several years been at their wits' end to increase the production with very little success.

It must be apparent to every thoughtful natural gas man that the greatly increased demand for their product created by reason of the coal shortage during the past winter, coupled with the constant and natural growth of the cities and towns, has brought about not only a temporary shortage in severe winter weather, but either has or will bring about a permanent shortage during succeeding winters unless an effective means of relieving the domestic peak load requirements during the coldest weather is found and adopted.

Gas companies generally find that the aggregate number of consumers is increasing in direct proportion to the growth of the municipalities which they serve, while they

—1918 Convention of Natural Gas Association of America.

Each crisis brings its word and deed.—Whittier.

are either experiencing trouble in obtaining the present supply of gas, or finding that even this is impossible, which brings them face to face with the fact that if anything like the present earnings are to be maintained, it is essential that they in some way maintain at least the present proportion of profitable consumers; everyone, generally speaking, agreeing that as soon as a consumer fails to use gas for heating, at least a great portion of the heating year, he becomes an unprofitable consumer for

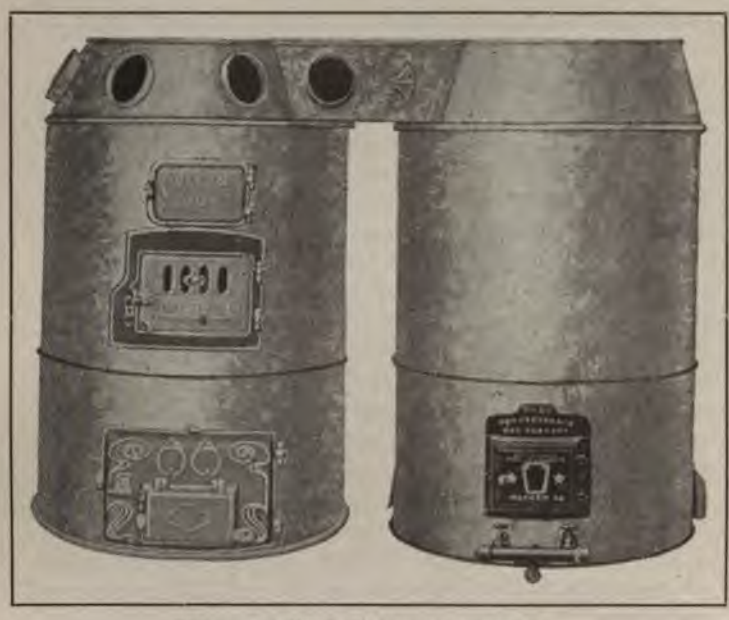


FIG. 2. AUXILIARY GAS FURNACE.
Pennsylvania Furnace Co.

the reason that the overhead and cost of gas is in excess of the amount derived for gas sold, at present rates, for ordinary cooking and lighting purposes. So that it is essential that the gas companies take some immediate steps to keep on their lines the heating consumption during the periods when they are able to supply the same. Further than this, there is the investment to take care of the consumer. There has already been expended a cer-

FIG. 3. AUXILIARY GAS FURNACE ROUND,
Gas Appliance Company.

tain amount of money which might be classed under the head "Cost of Attaching Business." This investment will have been in vain (in so far as the future is concerned) unless some steps are taken to hold the heating business at least seventy to eighty per cent. of the possible two hundred heating days in climates like that of Cleveland and Pittsburgh, and the gas companies are able to supply a sufficient amount of gas to their consumers from eighty-five to ninety-five per cent. of that time.

There is no question but what consumers who have used natural gas for heating purposes for any length of time certainly prefer it to any other kind of fuel and for this reason it seems that, if properly advised and the type

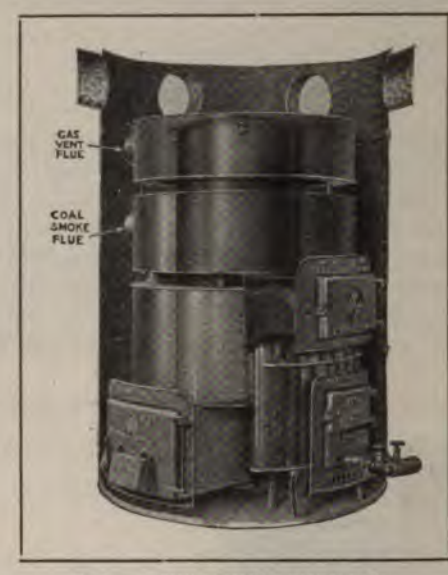


FIG. 4. TWO FUEL FURNACE,
Gas Appliance Company.

of appliance suggested which will permit of the use of a substitute fuel during the periods of shortage, as for instance coal or oil, without causing any great inconvenience in changing from one to the other, the larger portion of the heating business can be retained for the natural gas companies. The prime object of this paper is to suggest methods and means by which this most essential result may be accomplished. Few consumers, in the face of recurring shortages, will continue with favor the use of

FIG. 8. COMBINATION OIL & GAS BURNER,
Tate-Jones Company.

gas burning appliances in coal heating furnaces or boilers. The installation of gas burners in such furnaces or boilers, once so extensively advocated and adopted by natural gas companies and their consumers alike, especially during the

It takes a wise man to discover a wise man. Laertius.

earlier years of bountiful supply, are no longer adequate to meet the requirements of the changed and changing conditions, due to the cause above mentioned, and indicated by the periods of shortage during the past winter.

There are two general methods of centralized house heating, that is with warm air furnaces and with boilers —either steam or hot water. Of the two, the former method is by far the most common and will be discussed in greater detail.

There are two general types of warm air furnaces used for heating with natural gas—coal furnaces with gas burners, and straight gas furnaces—and neither used alone will meet the present situation.

If good burners are used in a coal furnace a thermal efficiency of from thirty to fifty per cent. can be obtained. When a man removes them during the first cold snap they usually stay out of the furnace until the cold weather is over for the year. Then perhaps they are again installed, consequently the gas company loses most of that man's heating business; as the possibility (which often resolves itself suddenly into a necessity) of personally enduring the dirt and discomfort of removing, and later on replacing gas burning appliances in such furnaces or boilers, or hiring a gas fitter to do so, is not contemplated with any degree of satisfaction. It is an irksome duty and an expense which will not be relished or endured very long. It must and will result ultimately in the adoption of coal for the entire winter season unless some adequate means as is herein suggested are generally adopted.

If burners are made that are easy to remove, or so they do not have to be removed, as for instance the common ring burners as used in many so-called combination furnaces, the gas bills are very high and the consumer dissatisfied.

On the other hand, a coal furnace with a straight gas furnace as an auxiliary, or vice versa, is known to work out satisfactorily. By providing the consumer with a two-fuel system, such as described above, he will have a dependable heating system which will be satisfactory in all weather conditions. Furthermore, the consumer thus equipped will continue to use gas during fall and spring and likewise during the winter, except during these periods of extreme weather where the substitution of coal is distinctly desirable. A consumer will provide himself with sufficient solid fuel to carry him over the time when gas is lacking, and when the shortage is at an end, will automatically go back to gas on account of the increased convenience. Furthermore, a man thus equipped will have a very efficient heating arrangement. He has a gas furnace which has an efficiency of from sixty to eighty-five per cent. and also a means of burning coal efficiently and his fuel bills will be consistent with the size of house heated and the weather conditions.

FIG. 3. AUXILIARY GAS BOILER.
Bryant Heater Company.

There are several types of auxiliary gas and coal furnaces, of which illustrations, 1, 2, 3, are typical.

In case the coal furnace, because of being worn out, has to be entirely removed, or in a new home, a two-fuel furnace containing two heating units in one, such as shown in illustration No. 4, answers the same purpose as the two units, that is, the coal furnace and the auxiliary gas unit. The gas unit, it is readily understood, should have the long fire travel needed for gaseous fuel in order that the proper efficiency can be had, while the coal unit should have a sufficiently large fire pot and a much shorter fire travel.

It will take much advertising, soliciting, and perhaps require the formation of a new department by the gas companies to induce people to make the extra outlay necessary to have a heating arrangement that will keep their houses warm, and still make it possible for the gas companies to sell their maximum amount of gas.

A good name is better than riches. Cervantes.

In order to see to it that the consumer gets an adequate and efficient appliance, it seems almost certain that the natural gas companies will have to do what the artificial companies have done for years, that is, they will have to handle the appliances which they want the consumer to use, and make offers which will be attractive enough to the consumer to make him want to spend the extra money necessary to give him a two-fuel heating system.

If the desired results are to be had in connection with cutting off the peak load by the introduction of auxiliary appliances, it will be possible to leave the matter in the hands of the dealers. The gas companies themselves will have to take up the burden in order to get prompt results. Where a dealer might sell one appliance at a price that will give him a fair return upon his investment, the gas company, by eliminating this feature and instituting a partial payment system, must sell a great many times this number. It can only be done by eliminating all profit and instigating a well defined and generous advertising campaign, together with personal solicitation on the part of the gas company's representatives, properly trained and educated, so that they may give the consumer all the facts and figures in connection with the installation of these appliances; and behind all this, the company's recommendation as to the desirability from the consumer's standpoint, of the appliances.

There will, of course, be objections raised by a great many as to the desirability of companies handling appliances.

First—The fear of prejudicing the dealers who handle furnaces. The dealers seldom, if ever, advertise or solicit the sale of furnaces and as the auxiliary furnace is not well known to the public, it would mean an entirely new field for the dealers, necessitating much advertising, which in most cases they have neither the money nor the inclination to do.

FIG. 6. AUXILIARY GAS BOILER,
Bryant Heater Company.

Second—Fear of increasing the consumption of gas rather than checking it. It is not for the purpose of increasing, but rather retaining and decreasing each individual bill that the gas companies should engage in the sale of auxiliary furnaces. If the majority of consumers had a two-fuel heating system they would all adjust themselves to using natural gas when available and some other solid fuel when the gas supply is insufficient, the actual number of such furnaces would have no effect on the supply excepting that all the gas that could be supplied at an adequate pressure would be used.

Third—Fear of damage claims. Damage claims are an unavoidable evil which the large artificial gas companies

Those who wish to appear wise among fools, among the wise seems foolish.—Quintilian.

have been able to contend with—why not the natural gas companies?

Fourth—The investment required. Undoubtedly a considerable investment would be required, but in the end the cost would be repaid in the increased good will, and constant peak sales. The consumer will most certainly revert to coal or some other fuel permanently if the shortages experienced last winter keep up and he is not shown some way of providing himself with a heating system where gas and some other fuel can both be used.

Auxiliary boilers for steam and hot water heating systems should be given the same attention that the warm air furnaces get. Here as in the use of warm air furnaces, a gas boiler can be made auxiliary to a coal boiler, or vice-versa, and when the supply is sufficient the gas boiler will be in use on account of the greater convenience. Here a readily removable kerosene burner might be of some value, as the average consumer that has hot water or steam heat in his home is generally equipped to provide for storage of kerosene or fuel oil. Illustrations 5 and 6 show typical auxiliary boiler installations and illustration 7 shows a kerosene burner adaptable for this type of work.

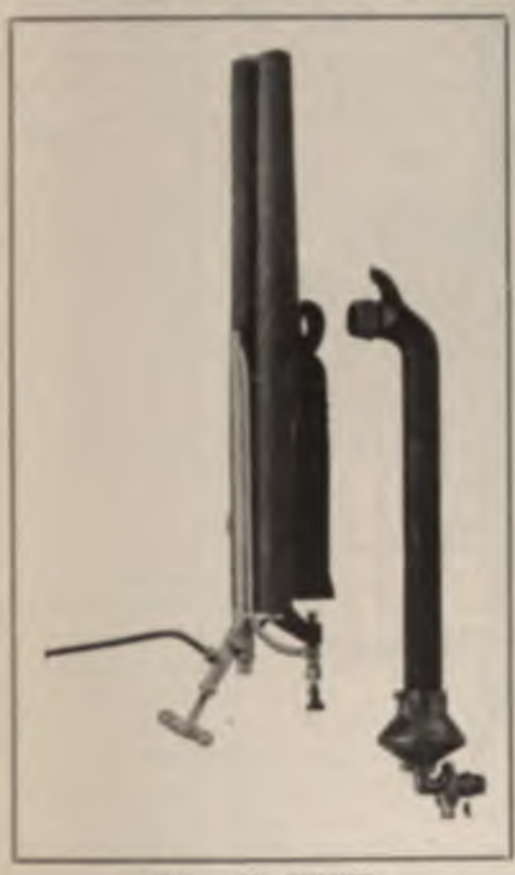


FIG. 7. OIL BURNER.
Bryant Heater Company.

One thing is absolutely necessary, that is, that the consumer gets the best appliance for his money. Before a campaign to persuade him to install auxiliary furnaces is started, the gas company should assure itself that the appliances they are advertising are the safest, most efficient and strongest that can be had for the price. The various auxiliary furnaces on the market that appear to be of value should be examined and in some manner, graded as to efficiency, price, etc., and the one showing the greatest merit should be the one recommended and sold.

FIG. 6. COMBINATION OIL & GAS HEATING FURNACE.

In this connection, we must not, of course, overlook the industrial consumer, as during the summer months he is the all-important one, in so far as the natural gas companies are concerned. Several years ago, a number of natural gas companies had sufficient gas to supply both their domestic and industrial consumers. Most companies, however, were obliged to shut off the gas

FIG. 11. GAS ENGINE WITH PRODUCER GAS & GASOLINE AUXILIARY.
Bruce Mcllroy Engine Company.

Bless the hand that gave the blow.—Dryden.

supply for industrial use last winter, and it is only a question of time when all natural gas companies will be obliged to do the same.

In order to supply the consumer with gas under the changed conditions, industrial consumers must be equipped with carburetors so that they can use liquid fuel or with gas producers, so that they can use producer gas during the extremely cold days in winter. Just which equipment they choose depends largely on local conditions and on the capacity of their plant. If the gas engine plant is large and the shut off periods are of long duration, producer gas plants should be installed. If the plant is small and the shut off periods of short duration, the carburetor equipment should be installed. Figure 11 shows a gas engine equipped to operate on natural gas, producer gas or gasoline. No matter which fuel the industrial consumer uses as a substitute for natural gas, he will find in summing up his year's fuel cost for gas engines, that he has saved money by using natural gas when available over what the cost would have been, had he used another fuel entirely.

Gas companies should exert every effort to retain the industrial business during the summer months when the domestic consumption is light. This can be done only by co-operating with industrial consumers to the fullest extent, by advising them in the spring of the year, just what they may expect and what they must prepare for during the coming winter, by telling them how to equip their plants to the best advantage, and if necessary, where to obtain their equipment.

In advising the industrial consumer, just as much care should be taken as in the case of the domestic consumer, that he be equipped with the best possible dual equipment. However, as a great many of the larger consumers have men that are well versed in the use of various fuels, for their individual problems, the matter of assisting them will be a simple matter.

Summing up, the consumer must be told very clearly and frankly how the situation lies, what must be done by him to make it possible to use natural gas the greatest portion of the time, and still have a convenient and economical way of heating when natural gas is not available, and how he is to go about getting the appliances that he needs. If that is done the gas companies will find that they will be able to hold most of their heating business and also improve their operating conditions.

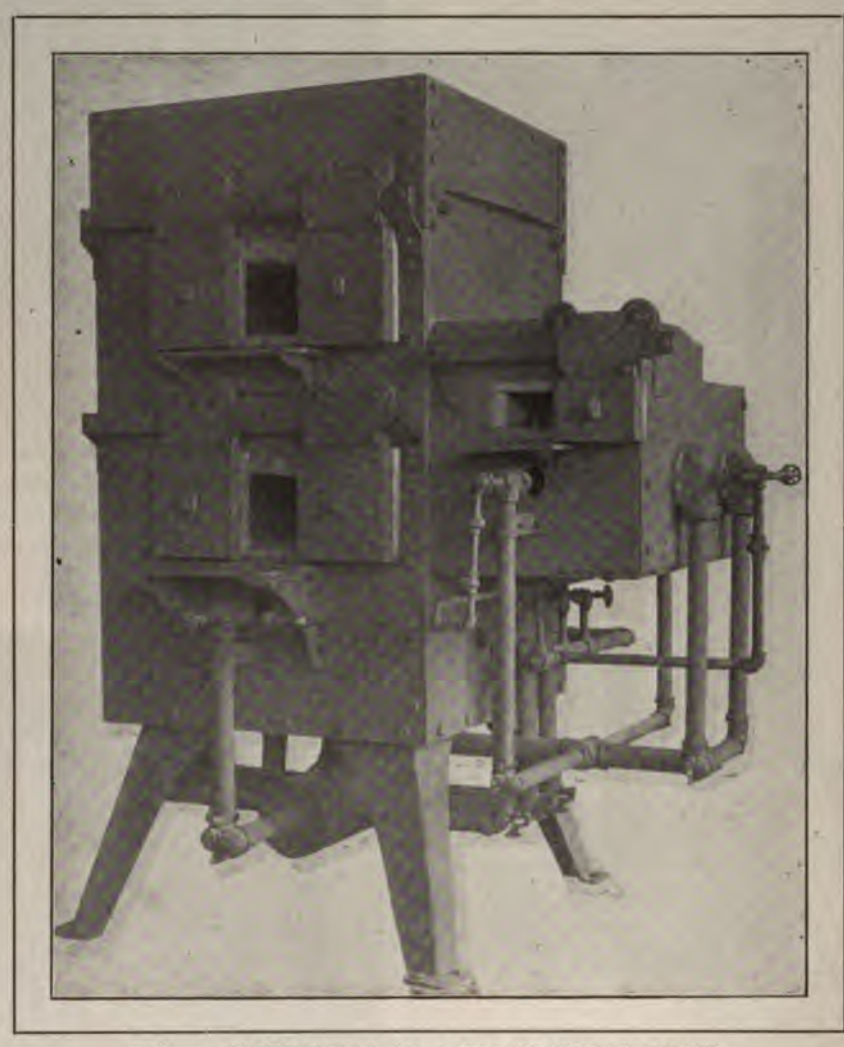


FIG. 10. COMBINATION OIL & GAS HEATING FURNACE,
Strong, Carlisle & Hammond Co.

Presented before convention of Natural Gas Association.

You won't find anything by losing your temper, but you may lose a lot.—Herbert Kaufman.

DISCUSSION.

DONALD McDONALD: I agree with every word in this paper but it does not go far enough. If our customers are equipped to heat with both gas and coal, they will not heat with coal so long as they can get gas. What is the result? The result is that three hundred people will not have the fuel with which to cook their meals in order that one family gets an abundance of gas to heat a great mansion with. Fifty feet a day will do the cooking of an ordinary family of moderate means. Fifteen thousand feet a day is no more than the mansion uses for its heating. In other words we not only need the installation of fuel appliances but we need the aid of the public authorities in saying that when there is not enough gas for everybody, the necessity of the many shall prevail over the luxuries of the few. (Applause.)

Gas Companies should not look at this question entirely from the standpoint of revenue. They have a duty which they owe to the public which unless they perform, their names become a by-word in the communities in which they exist and the unpopularity gained by them during the cold days of winter comes back to them in many ways after the winter is past. I do not fear at all that we will not get all the heating business we want when the weather is cold. Even when gas is more expensive than coal people who have once heated with it will not go back to coal as long as they can get it. My experience is that when many consumers have gone cold because they could not get gas for a few days on account of low pressure, good pressure will put those people back again on gas regardless of previous inconveniences, and the result of it is that 1 per cent of your consumers will use 25 per cent of your gas; 2 per cent will use nearly 50 per cent of your gas and 98 per cent will go without gas to cook their meals with.

It is a small matter to heat a house with coal. It merely requires the installation of proper appliances and the energy and at present the self-denial and public spirit necessary to build a coal fire. But when it comes to cooking, you could not get a consumer to have both a coal stove and gas stove. It is nonsense. When it comes to that our heating appliances are not arranged to burn coal so that the house-holder of moderate means is robbed of the little quantity of gas he needs for cooking the necessities of life. So I maintain that our duty is to give the great mass of our customers gas enough for cooking; gas enough for heating water and then to get such assistance as is necessary from the Public authorities in order to compel those who need immense quantities of gas to heat mansions, to heat those mansions wth coal. Coal can be stored in the summer. Gas cannot and the ordinary selfishness of men will cause them to have coal on hand with which to heat when they cannot get gas but that same selfishness will cause them to burn gas even though they have got the coal, until they hold the pressure down to half an ounce and hundreds of their neighbors are unable to cook for want of gas. That is the real problem before us gentlemen and we must face it from that standpoint,—from the standpoint of our public duty and part of that public duty is, when there is not enough for everybody, to let necessity prevail over luxury. I thank you. (Applause.)

J. C. McDOWELL: Mr. President I think we will have great difficulty in restricting the use of gase. That is, telling a man what he shall use it for. There is a decision of the Supreme Court of Pennsylvania which says explicitly that after the gas has passed the meter a man may use it for whatever purpose he chooses to use it for and until that is reversed we would find difficulty in getting the proper authorities to instruct a man in his use of gas. I am heartily in favor of auxiliary heating appliances. In many parts of the United States where Fuel Oil is available at reasonable prices I think Fuel Oil might be used advantageously. There is at present in California a burner that has over four thousand installations. It is a burner with a rotary spraying apparatus and the little power that is required by a small electric motor. It has also been introduced into some of the New England States. It works most satisfactorily. I think such an apparatus as that might be combined with the Natural Gas as an auxiliary and the results I feel quite confident would be successful in conserving Natural Gas at a time when it is most needed.

FRANK R. HUTCHINSON: Mr. McDonald made the statement that 50 feet of gas would be required for cooking by an average family per day while 15,000 feet would be required for heating a mansion.

It must be "some mansion" for I would think 1,000 cubic feet a day is nearer the fair average for the average home.

We are all agreed that the interruptions in gas service last Winter were unavoidable. Many of the Companies here represented attempted through circular letters, printed statements and in newspaper columns, to, in a general way, warn their consumers, before shortages occurred, to provide themselves with double equipment. Some consumers read and heeded the warnings, but the vast majority did not. Doubtless, because of the very general way in which these warnings were issued, they were not understood. I am free to say to you gentlemen, it is my opinion they were not specified enough. The efforts made, no doubt, were helpful, but, you did not go far enough. Experience has proven it is impossible to convey your exact meaning in an understandable way without your representatives coming in personal contact with the consumer and having a knowledge of just how he is equipped so as to intelligently advise him a way to care for his requirements. Most consumers view these interruptions as inexcusable. The attitude of the masses toward gas companies, generally speaking, is one of distrust. Shortage aggravates this condition.

Unless drastic methods are taken, doubtless gas companies will face unjust rulings and legislation. Some of you are already facing such a situation.

Do you realize, men, the very foundation of the business is shaking?

The remedy, since perhaps under existing conditions, a cure cannot be entirely effected, is to take the public into your confidence. If you want to make friends of

Powerful, indeed, is the empire of habit. Syrus.

your consumers, *do something for them.* Friendliness is good will. Don't wait to be asked what to do, anticipate your domestic and industrial consumers troubles, make a survey of each and every consumers needs, advise them properly a way out of their difficulty, even before it again occurs, and the reward will be greater than you can imagine.

This is not a time for mere talk—action must be given. To secure the results you want to accomplish, you must establish a department to solicit and sell Auxiliary Cooking, Heating and Industrial Appliances. Efforts have been attempted by some companies to do this by co-operation with dealers. Some little success has been met in this way. But, so little was accomplished as to make the results almost negligible. Experience proves the thing must be done by the Gas Company. Don't sit back, possibly because of precedent, and wait for some other fellow to help you out of your difficulty. Remember, this is your trouble, not his. Get busy and help yourself, act and act quickly, for unless you do, the situation may, and probably will, become more serious than you now realize.

In my judgment, the merchandising of appliances is now an absolute necessity and vital to the natural gas industry. Close contact with your consumers and intimate acquaintance of their needs, with proper advice as to the right and wrong way to employ gas as fuel, will prove an investment well made.

Many executives—and these are the gentlemen I am particularly addressing,—for they fix upon the policy of the companies they represent, may now, as they have in the past, look with disfavor upon selling auxiliary appliances. Get this out of your minds, forget precedent, think quickly over the subject matter of this paper, so ably presented by Mr. Emmerling and the discussions it is bringing out, then busily prepare to doubly equip your consumers and forstall this loud public wail and criticism.

Have personal calls made at each home and factory, advise what to do and how to do it. Even though consumer, for various reasons, may then conclude not to adopt your suggestions,—when interruptions in supply occur, instead of condemning the gas company, he will probably soliloquize to himself—"*wasn't I a dunce not to* have put in that Auxiliary appliance as advised by the gas company." Won't he blame himself rather than the gas company?

Think this over, you'll realize that will be their attitude. Further, it is a patriotic duty for each and every gas company to prevent, so far as possible, the waste of gas. Every cubic foot should be made useful in the most efficient way possible. Each cubic foot of natural gas used, helps save that much coal and its attending transport and hauling. Munitions and war supplies must be moved, regardless of the discomfort this may occasion through failure to transport coal.

Remember men, it is not for the purpose of increasing, but rather decreasing consumption, *safe, durable* and *efficient* auxiliary gas burning appliances should be recommended, sold and installed by gas companies. The maximum consumption, for example, of an average set of burners in a coal warm air furnace is about 160 cubic feet per hour, through a gas designed auxiliary warm air furnace only about 100 cubic feet per hour.

Think what such a saving means. Revolve in your mind, if all your consumers were properly equipped for heating, how much this saving would aggregate in cubic feet. How many pounds or tons of coal would it save?

To sum up, I have been most frank in my discussion, but earnestly so because of my knowledge of conditions, both as a gas man and as an appliance man and I can truthfully and honestly say I am absolutely sincere when I add that, for the life of me, I can't understand why many of the gas companies haven't seen the "light" before and taken up this matter, with spirit and zest, several years ago without waiting for the situation to become so acute as it has this past winter.

R. W. GALLAGHER: I heartily coincide with what has been suggested by Mr. Emmerling and as I feel he has covered the subject very thoroughly there is nothing to add to it on my part.

DONALD McDONALD: This is a matter that I think is exceedingly important. One of the speakers mentioned the legal difficulty involved and said that there were decisions of the Court to the effect that after the gas once passes the meter it is the property of the consumer and he can use it for what he pleases. The same is true of wheat. The same is true of sugar and yet there are decisions to the effect that when there is not enough to go around, everybody shall have a fair chance before anybody gets an excess. Now should that not apply to a necessity of life like gas just as is does to sugar and to wheat? We can live without sugar and wheat. People cannot live without cooking. I do not advocate that we should ask the Courts or the Public Service Commissions to say that people shall not heat with gas. I do advocate that Public Service Commissions in fairness to the public should say that whenever there is not enough gas for everybody to take on what he is willing to pay for then that everybody shall get enough for his necessities before anybody is allowed to take on an excessive amount for his luxury. I do not fear the falling off of the demand. There is no danger of that. We all know that it is the best fuel obtainable. That it is the least troublesome and at present it is cheaper than coal. There is no possibility of the gas producers being able to supply enough to take the place of all the coal and yet at present prices if people could get the gas they would burn it in reference to coal.

Now we are trying to perform a public duty which is to keep in our minds sufficient pressure to supply the necessary domestic uses and to meet the requirements of our customers. Now we have come to a time when we cannot furnish that amount of gas. Almost every city in the United States found it so last year. Now when that time comes should we sit by supinely and say that one man may have 15,000 feet a day for heating a mansion although in order to give him that 15,000 feet a day three hundred people—who are our customers also—cannot get 50 feet a day with which to cook? Is it reasonable? Is it fair?

Who speaks the truth stabs Falsehood to the heart.—Lowell.

We must remember that we are dealing with the public who do not understand this subject from the technical standpoint. We do know or are supposed to know it from the technical standpoint. Should we not enlighten the public and enlighten the authorities who control this matter, on that subject? If we can give good service to most of our customers although it involves three or four per cent of them going back to coal for heating, we would not be the by-word in our communities that some of us are and as long as people are able to say that when they need the gas the most they cannot get it we will have to submit to the unpopular position in which it places us. They need it the worst when they need it for cooking. They can heat with coal but they cannot cook with coal.

H. S. MORRIS: I agree most heartily with what Mr. McDonald has had to say. Our condition in Buffalo has been very serious the past year. In fact when we got to a temperature of thirty this spring we were very short of gas. From an investigation which has been going on for the last six weeks or more we have come to the conclusion that the large house-holder who is using natural gas for heating purposes is taking it away from the small domestic consumer who wishes to use it for cooking purposes. In many instances they have their cellars ful. of coal but under present conditions they do not want to use the coal for fear they cannot get a further supply of coal and hence they continue to use the gas regardless of the inconvenience they occasion to the small domestic consumer.

In my opinion if it is a question of law we should seek a remedy before the Public Service Commissioners looking toward a decision by them giving us authority to do certain things to help out the Gas Companies at a critical time when the larger majority of our consumers are in need of natural gas for such domestic uses as have been suggested.

In Buffalo we cannot do anything else than deliver the gas to the meter as it has been held by the Courts that when it passes the meter it becomes the property of the consumer and he can do anything with it that he pleases. We haven't any special contracts like the contracts existing in Pittsburgh and Cleveland and numerous other places. We have to give them what they will take. We should make concerted effort to remedy this situation so that we may be able to meet the demands of the small domestic consuer. We should go before the Public Service Commission and say "Will you grant such and such authority so as to control this proposition?" If we cut off our industrial consumers we would not save 7 per cent. Out of a delivery of fifty-five million in the coldest weather if we cut out our furnace consumers we would save ten million feet a day. Yet ten million feet a day would help out wonderfully in such critical periods. The pull would not be so strong all at one time as to exhaust your supply. My opinion is that we should make a concerted effort to ascertain what the Public Service Commissions will be able to do to help us out. And further than that to increase the price of gas so as to shut off these large consumers in that way if no other.

FRANK R. HUTCHINSON: It invariably happens where double equipment is installed for heating and the householder is provided with coal, when the gas becomes so low that he is not able to keep his home comfortably heated with gas he will resort to coal. I do not think there is any question about that. Take it home to yourself. If you had two furnaces or two boilers in your basement, one for gas and one for coal, and you could burn either or both fuels and you are short of gas and your home was not warm of course you would burn coal. So it is a situation that is automatically handled by the exigencies which exist at the time, where double equipment is installed, and that is what I think Mr. Emmerling was intending to bring out in his apper in recommending this double equipment.

WELDING MATERIALS.

WELDING with the oxy-acetylene process is truly an art, and yet not one that is difficult to understand, nor is welding in itself difficult. It is simply a matter of learning how to weld, just as one would learn how to solder. Of course, the methods used in these two lines of work are entirely different, yet it is not more difficult to learn one of the arts than the other.

An operator in either case must have his work properly prepared. In soldering it is necessary that certain metals should be "tinned" in order to make a proper solder joint. In welding, to get proper joints in certain work, the edge of the metal is best when beveled, leaving a V-shaped recess where the two pieces of pipe, for instance, are brought together to be welded. Then it is necessary to have *the right kind* of iron in the form of a welding-sick, which is melted by the torch, to build up the joint.

Welders, and those buying supplies for welders who are in the employ of corporations, should have in mind the fact that the very best joint, so far as mechanical skill is concerned, may turn out to be a poor joint, unless the proper kind of iron is applied in the welding stick. Of course, the very first quality of stick, if we may so term it, may cost more than a poor substitute. However, nothing is more expensive than that which will fail to produce a tight secure and lasting joint.
of the ground, fill the soil into the trench up to the ground level, tamp it and in some instances pave it over, and then find that a leak is developing, even though the pipe may have tested up tight at first, means a far greater outlay of money and time than had the best sort of welding-stick material been purchased at the outset, and only such used.

There are a number of makes of welding sticks on the market, and this article is not purposed to indicate which stick should be bought, but it is published with a view to impressing upon the buyers of welding sticks to be supplied to welders in the field, the need for being perfectly sure that *the best only* is purchased, and placed in the hands of those who do the actual work.

There are grades in welding sticks, just as there are grades in any other line of product.

The difficulty in life is the choice.--Moore.

Gas Pressure

Its Effect on Natural Gas Cooking Operations in the Home Based on Tests Made Under Direction of Edna Noble White, Grace Linder of Ohio State University and Samuel S. Wyer, Consulting Engineer.

SECTION II.

Section I of this article appeared in the Sept. issue of this magazine.

TABLE I.

Efficiencies obtained with three different types of gas stoves in heating 6 lbs. of water from the faucet temperature to 200 degrees F., at various pressures, using natural gas having a heating value of 1,000 B. t. u. per cubic foot.

Pressures in ounces per square inch..	.2	.4	.6	.8	1.	1.5	2.	3.	4.	5.
NATURAL GAS RANGE.										
Final temperature of water	200	200	200	200	200	200	200	200	200	200
Initial temperature of water	76	78	74	78	78	76	76	76	79	77
Rise of water..	124	122	126	122	122	124	124	124	121	123
B. t. u. in water	744	732	756	732	732	744	744	744	726	738
Cu. ft. of gas..	1.97	2.3	2.1	2.55	2.6	2.5	3.7	5.5	5.6	5.1
B. t. u. in gas.	1970	2300	2100	2550	2600	2500	3700	5500	5600	5100
Efficiency*%...	37	32	36	29	28	30	20	14	13	14
MANUFACTURED GAS RANGE.										
Final temperature of water	200	200	200	200	200	200	200	200	200	200
Initial temperature of water	76	78	78	77	78	75	75	78	73	77
Rise of water..	124	122	122	123	122	125	125	122	127	123
B. t. u. in water	744	732	732	738	732	750	750	732	762	738
Cu. ft. of gas..	1.71	1.87	1.9	2.2	3.1	2.7	2.55	2.1	2.6	2.45
B. t. u. in gas..	1710	1870	1900	2200	3125	2700	2550	2100	2600	2450
Efficiency*%..	43	40	35	33	23	27	29	35	29	30
HOT PLATE.										
Final temperature of water	200	200	200	200	200	200	200	200	200	200
Initial temperature of water	78	72	78	76	75	72	76	76	75	78
Rise in water..	122	128	122	124	125	128	124	124	125	122
B. t. u. in water	732	768	732	744	750	768	744	744	750	732
Cu. ft. of gas	2.45	1.825	1.65	1.65	2.125	2.05	1.9	2.95	2.08	2.
B. t. u. in gas	2450	1825	1650	1650	2125	2300	1900	2950	2080	2000
Efficiency*%...	21	42	44	45	36	33	39	26	35	36

*For definition of term "Efficiency" and method of calculation see Sections 3 and 26.

TABLE II.

Data obtained in frying 2 lbs. of thin sliced old, raw potatoes in an ordinary pressed steel skillet, with an ample supply of hot lard, on three different types of stoves, with natural gas at various pressures and having a heating value of 1,000 B. t. u. per cubic foot.

Pressures in ounces per square inch..	.2	.4	.6	.8	1.	1.5	2.	3.	4.	5.
NATURAL GAS RANGE.										
Cu. ft. of gas...	3.1	4.	4.3	3.45	3.72	4.8	4.6	5.65	5.5	5.9
Time in minutes	23	21	21	16	16	16	18	17	20	24
Flame length in inches	.6	.7	.7	.7	.8	.8	.9	1.	1.	1.1
Skillet distance, inches	.6	1.	1.	1.2	1.2	1.2	2.1	2.1	2.1	2.1
Barometric pressure in inches mercury	29.44	28.85	29.32	29.06	29.21	29.34	29.4	29.34	29.34	29.69
MANUFACTURED GAS RANGE.										
Cu. ft. of gas...	2.44	3.6	3.75	4.675	3.76	4.175	3.2	4.1	4.2	3.8
Time in minutes	22	20	19	18	21	21	22	15	19	17
Flame length in inches	.3	.5	.6	.7	.7	.7	.7	.7	.8	.9
Skillet distance, inches	1.1	1.1	1.5	1.6	1.7	1.7	1.7	1.7	1.7	1.7
Barometric pressure in inches mercury	29.42	29.21	29.34	29.16	29.24	29.34	29.26	29.41	29.33	29.21
HOT PLATE.										
Cu. ft of gas...	1.45	1.975	1.7	2.65	2.9	2.125	2.3	2.8	2.71	2.5
Time in minutes	30	28	30	25	19	21	21	22	19	18
Flame length in inches	.3	.3	.3	.5	.6	.6	.6	.6	.6	.7
Skillet distance, inches	.3	.7	.7	.7	1.7	1.7	1.7	1.7	1.7	1.7
Barometric pressure in inches mercury	29.225	29.2	29.56	29.18	29.07	29.15	29.28	29.41	28.98	29.21

TABLE III.

Data obtained in boiling 2 lbs. of old, unpeeled potatoes in 6 lbs. of water, in an ordinary granite-ware kettle, on three different types of stoves, with natural gas at various pressures and having a heating value of 1.000 B. t. u. per cubic foot.

Pressures in ounces per square inch..	.2	.4	.6	.8	1.	1.5	2.	3.	4.	5.
NATURAL GAS RANGE.										
Cu. ft. of gas....	5.	5.5	6.62	6.	7.15	7.15	8.27	9.35	9.35	10.
Time in minutes	47	33	32	29	30	24	34	35	38	37
Flame length in inches	.6	.7	.7	.7	.8	.8	.9	1.	1.	1.1
Vessel distance, inches	.6	1.	1.	1.2	1.2	1.2	2.1	2.1	2.1	2.1
Barometric pressure in inches mercury	29.42	29.20	29.33	29.04	29.22	29.34	29.40	29.34	29.34	29.68
MANUFACTURED GAS RANGE*										
Cu. ft. of gas...	4.83	5.4	5.9	6.45	6.55	6.4	5.19	5.3	5.7	6.1
Time in minutes	45	33	30	27	26	31	40	23	27	25
Flame length in inches	.3	.5	.6	.7	.7	.7	.7	.7	.8	.9
Vessel distance, inches	.5	.9	1.3	1.6	1.7	1.7	1.7	1.7	1.7	1.7
Barometric pressure in inches mercury	29.425	29.215	29.18	29.16	29.22	29.36	29.29	29.34	29.23	29.21
HOT PLATE.										
Cu. ft. of gas...	4.29	4.05	4.	4.	4.75	4.85	3.9	4.45	4.9	4.4
Time in minutes	85	61	47	40	41	37	39	34	35	32
Flame length in inches	.3	.3	.3	.5	.6	.6	.6	.6	.6	.7
Vessel distance, inches	.3	.7	.7	.7	1.7	1.7	1.7	1.7	1.7	1.7
Barometric pressure in inches mercury	29.32	29.20	29.56	29.29	29.06	29.34	29.28	29.41	28.98	29.21

*This stove was designed for manufactured gas and gave these results with natural gas without any change in stove construction, or adjustment.

§9. CONCLUSIONS.

1.—Satisfactory cooking operations in frying potatoes, boiling potatoes, frying beefsteak, and pan-broiling beefsteak can be carried on with .2 oz. natural gas pressure.

2.—The changes in vessel position necessary to permit satisfactory operation at pressures as low as .2 oz. are easy to make and require no special changes in existing stoves.

3.—Bread can be satisfactorily baked with .5 oz. natural gas pressure.

4—Natural gas stoves are not properly constructed to use natural gas efficiently at high pressures, nor satisfactorily at low pressures.

5—At high pressures natural gas stoves are inefficient and therefore wasteful in their use of gas.

A wrong-doer is often **a man that has left something undone, not always he that has done something.—Aurelius.**

6—The burners on natural gas stoves are too low.

7—The holes in the spuds of natural gas stoves are too small.

8—Long flames for cooking operations are wasteful.

9—The maximum results are obtained with many short flames rather than a few long flames.

10—A strong draft of air may deflect the flame away from cooking vessel so as to seriously interfere with and in many cases stop cooking.

11—Where two flames strike each other, due to the fact that openings are too close in burner, poor combustion will result. This will produce a luminous flame which will in turn result in a smoking burner. Neither air nor gas adjustment can overcome this.

12—Drilled burners are better than slotted burners, because there is less likelihood of two adjacent flames striking against each other, therefore producing imperfect combustion conditions.

13—Natural gas cook stoves should not be furnished with solid stove tops since this suggests the carrying on of cooking operations on top of the stove. rather than with the vessel in the proper position.

14—At low pressures no perceptible change can be made in the combustion conditions by adjusting the air shutter. The best conditions obtained were with the shutter wide open.

15—Too much heat is used in most cooking operations, correct application is more important than mere intensity.

16—The natural gas pressures carried in most natural gas distributing plants are too high for efficient operation.

17—Meter registration is approximately correct regardless as to variation in pressure. That is, meters do not run faster when the pressure is low.

18—Lowering the temperature of natural gas increases its heating value per cubic foot. Natural gas has a temperature about 25 degrees lower in the coldest month in winter than in the hottest month in summer, and the heating value per cubic foot due to change in temperature is therefore about 5 per cent higher in the coldest month in winter than in the warmest month in summer.

19—The maximum possible variation of heating value due to variation in gauge pressure would make the heating value during the low pressure periods in winter less than 3 per cent lower than during the high pressure period in summer.

20—Since the heating value increase due to low temperature of gas in winter more than offsets the possible decrease in heating value due to low pressure, the practical effect of the two is that the heating value per cubic foot of natural gas as served in the winter under low pressures and low temperature is higher than that served in the summer under higher pressures and higher temperature.

21—Variation in barometer from day to day may make more of a change in the heating value of gas than any possible variation in gauge pressure.

22—Better and more efficient service could be rendered if natural gas pressures were generally lowered to probably 2 oz. rather than increased to 4 oz. or above.

23—The lowering of natural gas distributing pressures to approximately 2 oz. would produce more efficient and satisfactory operating conditions for the consumer, would greatly curtail the leakage on the consumer's premises, which is paid for by the consumer, and would also substantially lower the leakage in the gas company's distributing plant.

Part II.

FUNDAMENTAL PRINCIPLES UNDERLYING NATURAL GAS PRESSURE QUESTION.

§10. DEFINITION OF "NATURAL GAS."

Natural gas is a highly combustible gas made by a secret process of nature. It is not a chemical compound—as popularly supposed—but a mechanical mixture of several combustible and diluent gases and vapors thoroughly diffused—that is, thoroughly intermixed—through each other. the number and exact proportion of the various crude natural constituents varying for the different localities and somewhat during the working lives of individual wells.

§11. WHAT MAKES GAS PRESSURE.

Natural gas is a fluid composed of a large number of molecules which are vehicles of energy continually in motion and having an inherent tendency to get farther and farther apart. The range of motion of the molecules is limited only by the volume of the closed containing vessel in which they constantly move to and fro. That is, the molecules are in a state of constant bombardment against each other and against the sides of the containing vessel.

Natural gas pressure is the result of the combined efforts of all the moving molecules in the gas trying to get farther and farther apart; that is, a mass of gas enclosed in a vessel expands and fills it, and, being restrained from further expansion, it exercises a pressure against the walls of the vessel. This pressure is the same in all directions on equal areas of surface. Contracting the volume of gas increases the intensity of its internal molecular motion and therefore increases its pressure.

With a given mass of gas any increase in volume of containing vessel will give the molecules more range of motion and thereby lower the pressure.

Thus, if a part of a given mass of gas is removed from a closed vessel or reservoir the remaining mass of gas will expand instanter and keep the vessel or reservoir filled, but at a lower pressure.

§12. GAUGE PRESSURE.

This is simply the pressure indicated by a pressure gauge. Two general classes of gauges are used for measuring gas pressure:

a—Spring Gauges—Where the effect of the pressure exerted against some form of spring is made to move a pointer over a graduated dial or scale.

b—Fluid Gauges—Where the effect of the pressure is indicated by the height of the column of fluid in a "U" shaped tube. One side of the "U" shaped tube is open to the atmosphere and the other is

attached to the pipe where the pressure is to be measured. The gas pressure in this pipe then lowers the fluid in one side of the tube and raises it in the other. The total difference in the heights of the fluid on the two sides represents the total fluid pressures as shown in Fig 1. When no pressure is applied to such a "U" tube gauge other than the prevailing atmospheric pressure, the liquid will stand at the same level in both tubes.

The pressures in natural gas distributing plants are almost universally measured in ounces per square inch, while the pressures in manufactured gas distributing plants are measured in inches of water, 1 oz. equalling 1.73 inches of water.

Where the word pressure occurs in ordinances or rules it invariably means gauge pressure.

§13. ATMOSPHERIC PRESSURE.

Atmospheric pressure is measured by a barometer—usually in inches of mercury, one inch of mercury equalling .49 lb. per square inch pressure—and is synonymous with barometric pressure.

Sea level is the datum from which atmospheric pressures are reckoned. At that point dry air at 32 degrees Fahrenheit exerts a pressure of 14.7 lbs. per square inch.

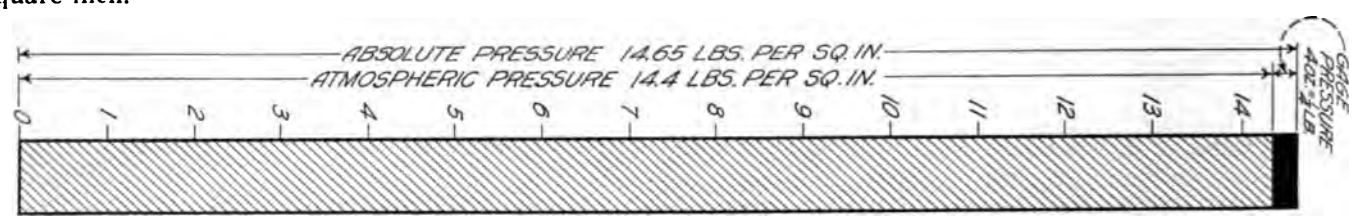


FIG. 10—DIAGRAM SHOWING RELATION OF ATMOSPHERIC PRESSURE AND GAGE PRESSURE.

This pressure varies with altitude and temperature, the pressure decreasing with an increase in altitude or temperature. 14.4 lbs. represents a fair average barometric pressure for most natural gas using communities.

§14. BAROMETRIC CHANGES MAKE MORE DIFFERENCE ON TOTAL PRESSURE THAN GAUGE PRESSURE VARIATION.

On account of the changing atmospheric conditions the barometric pressure of gas varies from day to day, and from hour to hour on the same day, thus, during these tests the barometric pressure varied from 29.69 to 28.85 inches of mercury, the equivalent of .41 lbs.—6 oz.—or considerably more than the entire range in gauge pressure.

§15. ABSOLUTE PRESSURE.

This is the sum of the gauge pressure and the barometric pressure. Thus, if the gauge pressure is 4 oz. —equalling 25 lbs.—and the atmospheric pressure 14.4 lbs. per square inch, the absolute pressure will be 14.65 lbs. per square inch, as shown in Fig. 10. This must be used in all gas calculations dealing with change of volume due to effect of pressure.

Failure to appreciate that the absolute pressure, rather than merely the gauge pressure, must be used when computing the effect of pressure on gas volume, or heating value content, has been responsible for most of the misunderstanding regarding the effect of variation in gauge pressure on gas quality and gas service. small change in volume due to variation in gauge pressure is shown in Fig. 11, and the table in Sec. 23.

§16. DIFFERENTIAL PRESSURE.

This is the difference between the pressure at the inlet and outlet point of a gas line. Thus, if the inlet pressure is 6 oz. and the outlet pressure is 4 oz., the differential head, or pressure, is 2 oz. In gas transmission it is the differential pressure that constitutes the effective force for pushing the gas through the line.

§17. WHAT MAKES GAS FLOW?

The inherent tendency of gas to expand is the basic cause of gas flow. Gas flow in pipes cannot take place except between openings of higher to openings of lower pressure. That is, flow can be obtained only by sacrificing pressure. For this reason, it is a physical impossibility to maintain uniform pressure conditions and at the same time have gas flow through the lines.

§18. EFFECT OF PRESSURE ON GAS VOLUME.

For practical purposes, at a given constant temperature the volume of natural gas is inversely proportional to the absolute pressure—see Sec. 15—to which the gas is subjected. That is, with a given mass of gas, if you double the absolute pressure you reduce the volume one-half, or if you double the space in which a given mass can expand you reduce the absolute pressure one-half. This is known as Boyle's Law. The

§19. EFFECT OF TEMPERATURE ON GAS VOLUME.

Natural gas expands approximately 1 per cent in volume for each 5 degrees Fahrenheit increase in temperature, and contracts 1 per cent in volume for each 5 degrees Fahrenheit decrease in temperature. The variation in mean monthly temperature of natural gas at Columbus, Ohio, is shown in Fig. 12.

The variation in temperature of natural gas in the underground mains makes more difference in the heating value than the variation in gauge pressure. The maximum fluctuation in temperature producing a difference in heating value of about 5 per cent, while the maximum fluctuation in pressure produces a difference in heating value of less than 4 per cent. Furthermore, these variations work in opposite directions. That is, in winter time when the pressure is low, therefore tending to decrease the heating value, the temperature is low, tending to increase the heating value. This increase due to low temperature will always be more than the decrease due to low pressure.

§20. STANDARD CONDITIONS.

Since the volume of a gas varies with the temperature and pressure, in order to secure comparable results in gas calculations, and the establishment of standards, a standard condition is necessary. This is

It is not good enough to do good; one must do it the right way.—Morley.

usually taken at 32 degrees Fahrenheit and a pressure of 29.90 inches of mercury.

§21. HEAT UNIT.

The unit quantity of heat, or the heat unit, is the quantity of heat required to raise the temperature of a unit weight of water one degree. Different kinds of units in use are as follows: The British Thermal Unit—B. t. u.—is universally used in America in engineering work. The calorie is universally used in food problems; where used elsewhere it has been customary to use the expression "large calorie" to

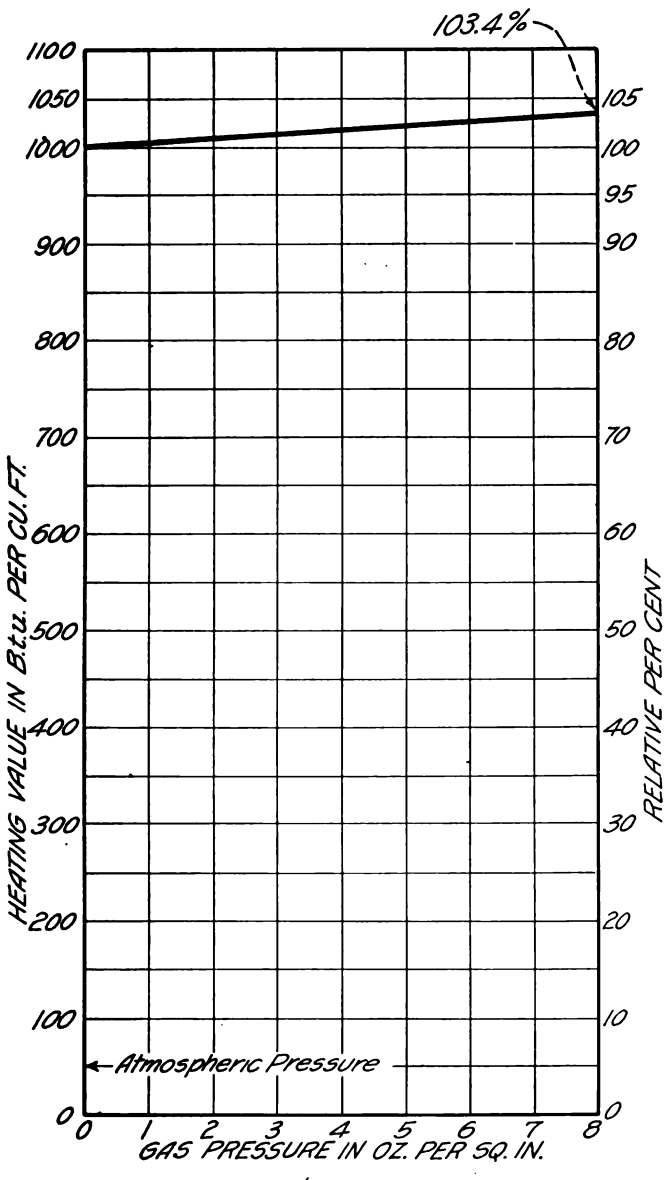


FIG. 11—CURVE SHOWING EFFECT OF PRESSURE ON GAS VOLUME AND GAS HEATING VALUE.

distinguish it from the small calorie. The gramme calorie, or small calorie, is universally used in scientific work.

BRITISH THERMAL UNIT.

Abbreviated B.t.u., is the heat required to raise one pound of water one degree Fahrenheit.

CALORIE.

This is the amount of heat required to raise one kilogram of water one degree Centigrade.

GRAMME CALORIE.

This is the amount of heat required to raise one gramme of water from zero Centigrade to 1 degree Centigrade.

The arithmetical relation of these three units is as follows:

B. t. u.	*Large Calorie*	*Gramme Calorie*
1.	= 0.252	= 252
3.9682	= 1	= 1 000
0.003968	= 0.001	= 1

§22. HEATING VALUE.

This is the number of heat units that are evolved by the combustion of a unit weight or volume of fuel. The terms "calorific value," "calorific power," "heating power," "thermal value." and "heat of combustion" are frequently applied to the same phenomenon.

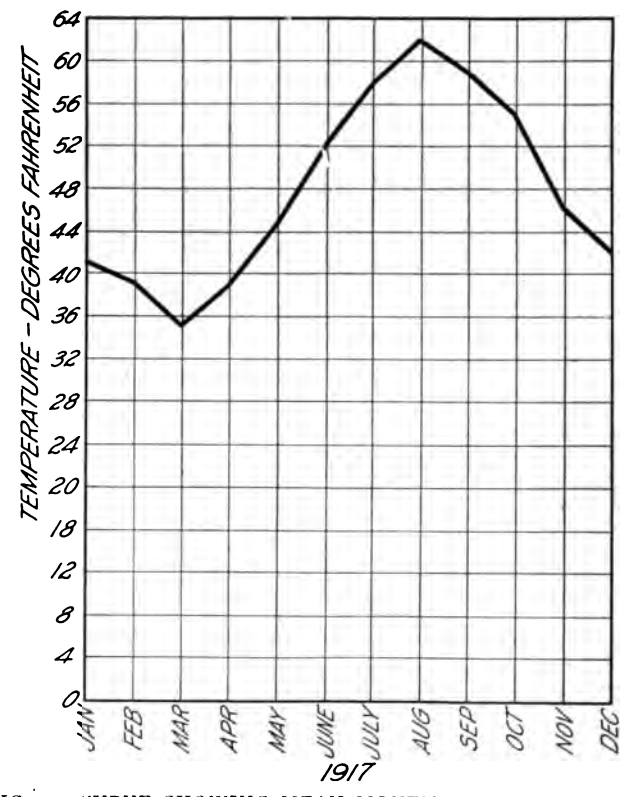


FIG. 12—CURVE SHOWING MEAN MONTHLY TEMPERATURES OF NATURAL GAS IN GAS MAINS AT COLUMBUS, OHIO.

§23. EFFECT OF PRESSURE OR TEMPERATURE CHANGES ON HEATING VALUE OF GAS.

These will produce changes in volume, but will neither destroy nor create any heat units, and hence will neither increase nor decrease the total number of heat units contained in the gas. However, the volmetric changes will always alter the distribution of the total number of heat units, as follows:

Gauge Pressure Above Atmosphere	*Relative B. t. u.*	*Relative Per cent.*
8 oz.	1034	103.4%
7	1030	103.
6	1026	102.6
5	1022	102.2
4	1017	101.7

After all there is but one race—humanity.—Moore.

3	1013	101.3
2	1009	100.9
1	1005	100.5
0	1000	100.

Gas Temperature Fahrenheit	*Relative B. t. u.*	*Relative Per cent.*
65	970	97%
60	980	98
55	990	99
50	1000	100
45	1010	101
40	1020	102
35	1030	103

§24. COMBUSTION OF NATURAL GAS.

The combustible constituents of natural gas are made up of combinations of the elements carbon and hydrogen. When natural gas is burned so as to secure perfect combustion only carbon dioxide and water vapor are formed. That is, the carbon of the gas unites with the oxygen of the air forming carbon dioxide and the hydrogen of the gas unites with the oxygen of the air forming water vapor. The water vapor, of course, will condense when cooled. This water vapor does not come from the gas. but is created and formed by the chemical action of the hydrogen in the gas and the oxygen in the air.

Each cubic foot of natural gas burned requires approximately 9½ cu. ft. of air, forming 10½ cu. ft. of combustion products, which are made up of 2 cu. ft. of steam, 1 cu. ft. of carbon dioxide, and 7½ cu. ft. of nitrogen, all thoroughly diffused through each other.

The combustion of 1,000 cu. ft. of natural gas will form 2,000 cu. ft. of water vapor or steam, and this when condensed will make approximately 10½ gallons of water. This is not peculiar to natural gas, but is true of all gases containing hydrocarbon compounds. 1,000 cu. ft. of manufactured gas will form about one-half the water vapor produced by the combustion of 1,000 cu. ft. of natural gas. It is this water vapor that causes the bakers and broilers of stoves to rust, and where gas is used in open fires without flues, or for lighting, makes the walls and windows sweat and glued furniture to open up.

If the combustion is not perfect, then carbon monoxide, which is a deadly poison, may be formed. The toxic action of this is so marked that 1/10 of one per cent. is enough to produce fatal results. This is especially likely to be formed when a flame is suddenly impinged on a cold surface. as for instance the first few seconds operation of an instantaneous hot water heater.

§25. ACTION OF GAS MIXER.

As stated in the preceding section, about 9½ cu. ft. of air must be mixed with each cu. ft. of natural gas in order to secure perfect combustion. In order to accomplish this the gas at a pressure above atmospheric air is forced through a small orifice by the gauge pressure in the gas pipe, and thus acquires a relatively high velocity in passing through the small opening, as shown in Figures 13 and 14. In this way an aspirating action is produced around the orifice and this draws atmospheric air from the room in so that it will mingle with the gas. A gas mixer is therefore in effect merely a small air injector. The mixer shown in Fig. 13 is the one most generally used, and has no adjustment for the gas. The mixer shown in Fig. 14 has a stationary cone and by turning the spud, with a wrench on the hexagonal head of the spud, the effective area of the orifice may be made larger or smaller, thus changing the velocity of the gas, and. therefore, its aspirating action. We did not run any tests to determine the relative merits of the two types of mixers.

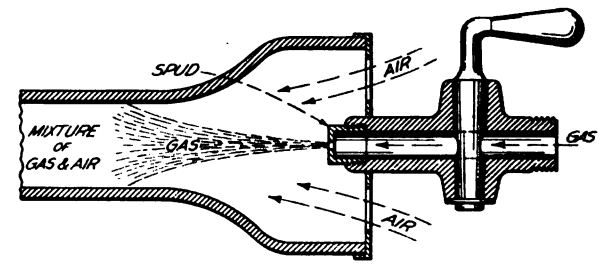


FIG. 13—DIAGRAM SHOWING CONSTRUCTION OF ORDINARY GAS MIXER.

§26. EFFICIENCY.

The term "efficiency" which has become a hackneyed one on account of its misuse, means the ratio between input and output. In other words, the percentage of input energy that can be accounted for on the output side of the device.

§27. EFFICACY.

This is the power to produce an intended effect, and is entirely separate and distinct from the efficiency of the process. For instance, a gas burner may be efficient and yet not be effective. On the other hand it may be able to produce results, that is secure efficacy, with very low efficiency.

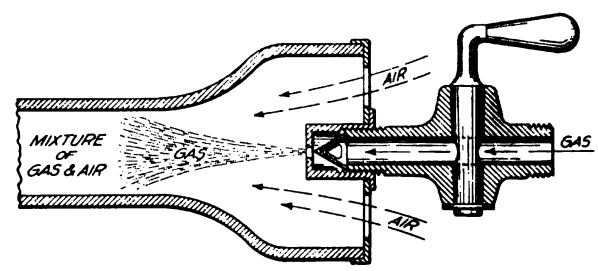


FIG. 14—DIAGRAM SHOWING CONSTRUCTION OF GAS MIXER WITH ADJUSTABLE SPUD.

§28. COOKING AND HEATING DISTINGUISHED.

In a heating operation it is merely necessary to secure perfect combustion in the heating device, because in so doing all of the available heat in the gas can be utilized. In cooking it is not only desirable to secure perfect combustion, but absolutely necessary to direct the heat to a particular place and sometimes at a particular time. It is for this reason that gas cooking operations are more susceptible to changed pressure conditions than heating operations.

It may not be amiss to emphasize that the time element in many cooking operations is of much more importance than intensity.

There is great ability in knowing how to conceal one's ability.—La Rochefoucauld.

Use of Motor Vehicles

A Thoroughly Systematic Method Described by W. W. Beaumont

THE progressive United Gas Improvement Company finds the old-fashioned means of motive service, similar to that unfortunate disease, locomotor ataxia, in other words, a business still using the old type vehicles, is simply hobbling along. Therefore, as in other matters, the "U. G. I." is up and doing in its motive power department under W. W. Beaumont, Superintendent of Transportation.

In the distribution department of the Philadelphia Gas Works there are 32 automobiles, 91 motor cycles, 68 side cars, 64 gasoline wagons, and 20 electric trucks. The automobiles range from Ford runabouts, to an eight cylinder Cadillac, a wide range, including six-cylinder Buicks. The motor cycles represent both single and twin cylinder "Reading" types. The gasoline "wagons," so termed, range from Fords to five-ton White trucks, while the electric vehicles range from 1,000 to 7,000 pounds, and are of the "General" Vehicle, also the "Commercial" Vehicle manufacture.

There are several "forms" used, upon which to make reports covering mileage, when in use, hours idle, hours under repair, gasoline consumed, oil and grease required, etc. Form No. 118 is designed as a monthly report by days. Numerically the date starts with the 20th of the month, ending half way down the blank with the 31st, then beginning with 1 and running to 19. Each item in the heading, as shown in our reproduction, is naturally lined off from the other headings by column rules, as is usually the form in report blanks.

We describe the several forms as indicated to us by Mr. Beaumont in a recent communication, and would say that in "Form" No. 619, the names of the several months of the year appear in the left hand column, and that the blank naturally is ruled into columns to suit the several headings indicated.

No. 618. This form is made out daily, but is a monthly report for each motor vehicle, and is made out by garage mechanics. At the end of the fiscal month this form is sent to Superintendent of Transportation office, where the data is transferred to Form No. 619. To complete the remaining data on Form 619 the additional costs are obtained from our job orders, which have been originated during that particular month. You can see that at the end of the year, after all charges have been properly recorded and accounted for, this Form No. 619, readily tells the cost per mile of each motor vehicle.

Form 618

MOTOR VEHICLE MONTHLY REPORT

AUTOMOBILE

.....191....

CO. No.....USED BY.....

Date	Cyclometer Readings	In Use	Idle	Under Repair	Gasoline Qts.	Oil Pts.	Grease Pts.	Remarks

Form 570

VEHICLE TIRE RECORD

MAKER'S NO..... SIZE.....

COMPANY NO..... MAKE..... PURCHASED.....

Date On	Vehicle Number	Mileage	Date Off	Mileage	Total Mileage	Repair Cost	Adjustment	Cost of Tire	Total Cost

FORM 343

TIRE REMOVED.

MAKER'S NUMBER .....
MAKE .....
COMPANY'S NUMBER .....
DATE REMOVED .....
MILEAGE .....
VEHICLE NUMBER .....
SIGN .....
DISTRICT .....

TIRE REMOVED.

MAKER'S NUMBER .....
MAKE .....
COMPANY'S NUMBER .....
DATE REMOVED .....
MILEAGE .....
DISTRICT .....
VEHICLE NUMBER .....

TIRE PUT ON

MAKER'S NUMBER .....
MAKE .....
COMPANY'S NUMBER .....
DATE PUT ON .....
MILEAGE .....
VEHICLE NUMBER .....
NEW? ..... OLD? .....
SIGN .....
DISTRICT .....

Forms No. 343 and No. 570 represent our tire record. Form No. 343 is made out by the garage mechanic who changes tires, filling in required information. Tag is then tied to the shoe or tube and sent to our company vulcanizer, who tears off the bottom half of the tag, and forwards it to the Transportation Office, where the data

. Be not careless in deeds, nor confused in words, nor rambling in thought.—Aurelius.

is transferred to Form No. 570. The repair costs for this tire are obtained later through our job order system. We also have another form, of which at present I am unable to send you a sheet, which shows us the operating cost per mile, less battery cost of our electric wagons. The data for these costs is obtained through our job order system.

The cost system is obtained on a job basis. No work, no matter how small, may be done unless a job order is first issued for the work.

The above records are kept of each individual four-wheel vehicle, so that we are in a position each month, to ascertain why certain vehicles are costing more than others.

Our motor cycle and side car costs are kept collectively, that is to say, all motor cycles are in one account and all side cars in another.

It may be possible that after the beginning of the new year we may decide to eliminate individual costs in four-wheel machines and keep this cost collectively against the make of a machine, and its capacity, in order to cut down as much as possible increasing clerical work.

In these days when the government is so in need of every war article that can be produced, and is employing to capacity, our manufactories, no one should allow an expensive piece of household or commercial or industrial equipment to go-by-the-board, through rust, when there is a liquid available to prevent and overcome exactly that type of warfare against conservation.

The gas company should watch out against rust deterioration using a compound such as this, on the sheet-metal equipment handled, thus preventing even defacement. Then the gas company should campaign the sale of bottles of the liquid urging its use and giving full instructions as to how this should be used in order to comply with the government's injunction, "SAVE."

We are not seeking to boost a particular article of manufacture, but are urging the matter from another standpoint, the intent to encourage the use of rust-preventing and rust-overcoming compounds. Let all, however, be warned against compounds made by unreliable concerns, there are such concerns that are simply out for the money.

Form 619

MOTOR VEHICLE YEARLY REPORT

COMPANY'S VEHICLE NO.....MAKER'S NAME.....MAKER'S NO.....DISTRICT.....

YEAR		PERFORMANCE				EXPENSE										
		Ready to Use				Cleaning		Repairing		Batteries	Gasoline	Lubricant	Repair Parts	Tires	Tools and Equipment	
Month	Mileage	In Use	Idle	Under Repair	Total	Hrs.	Cost	Hrs.	Cost	No. Cost	Gals. Cost	Qts. Cost	Cost	No. Cost	Cost	Total

Form 347

BATTERY RECORD

YEAR..... COMPANY NO..... .....DISTRICT
BATTERY NO..... MAKER..... COST.....PURCHASED.....
TYPE..... AMPERE HOURS CAPACITY..... Used on.....Lb. Wagon

					EXPENSE							
		Days in	No. of	Miles Per	Cleaning		New Wood Separators		Positive Renewal		Total	
Date	Mileage	Service	Charges	Charge	Labor	Material	Labor	Material	Labor	Material	Cost	Remarks

PRESERVING SHEET METAL.

Along the Lines of Government Sanction, Following the Injunction—"Exercise Conservation."

AFTER sheet-metal has been formed, and has become a part of the gas-range, room-heater, or tank-heater, it seems a shame to have that destructive element, rust, take hold upon it, eating its way through or destroying the surface-finish, when this might have been prevented, or even might be stopped before it has gone too far in its work of destruction.

It is our desire to editorially direct attention to the fact that a specially compounded preparation with an oil base, is available in bottled form, or in bulk, for use on the sheet metal parts of gas appliances. We mention the name "Stovoil," as the title speaks its mission. Not only is this compound used as a rust preventive, but as a means to overcome rust after it has attacked a sheet-iron or cast-iron part.

SALE OF WELDING STICKS.

OF COURSE, those who have been accustomed to welding pipe lines in making drips from steel or wrought iron pipes, welding-in lines from headers, and forming by welding various unusual layouts of wrought and steel pipe, know that to do the best kind of welding, one must have the right kind of welding sticks. These sticks are the equivalent to sticks of solder used in the tinsmith's field. They are not heavy sticks, however, but are small in diameter, and are melted away at the point by the oxy-acetylene flame which with the released metal builds up the joint that is stronger than the pipe itself.

We would advise welders to be careful where they buy their welding sticks, and what welding sticks they buy. There are certain makes that are admirable and are especially worth while. There is an old saying, "A word to the wise is sufficient."

Toil is the law of life and its best fruit.—Morris.

RESULTS OF DRILLING---LATEST REPORTS.

PENNSYLVANIA FIELD

ALLEGANY FIELD.

Barnes, A. T. Jones	Dry
Carpenter & Co., Potter Gas	Gas

MIDDLE FIELD.

Johnson, Johnson & Myers Bros 12	Gas

BRADFORD FIELD.

Baldwin, Forest Oil	Dry
Fee, Mix Creek Oil 89	Dry
Dry	2

VENANGO-CLARION.

Pithole Oil, Tague & Troutman 5	Dry
W. B. Flickner, Gunsburg & S. P. O. 13	Dry
Nelson Stover, S. P. McCalmont Est. 2	Dry
Lebrum, S. P. McCalmont Est. 2	Gas
Dangler, F. D. Kahle 1	Gas
Clarion County—	
Mrs. H. F. Peck, Kane, Bartlett et al.	Dry
Hoover, Hoover & Co.	Dry
Dry	5
Gas Wells	2

BUTLER-ARMSTRONG.

Turner, P. G. Turner	Gas
Pisor, Baird & Co. 1	Dry
Whitmire, Haverstraw & Co. 1	Dry
Jacob Dambaugh, Pittsburgh parties 1	Dry
Dry	3
Gas	1

SOUTHWEST PENNSYLVANIA.

Washington—	
Thompson, Manufacturers L. & H. 2	Gas
Plymire, Carnegie Gas 1	Dry
Kerr Hrs. Mftrs. L. & H. 2	Gas
England, Manufacturers L. & H. 3	Gas
Imperial—	
Petrie, Watson & Co. 1	Dry
Dorseyville—	
Johnston, Fried & Schlagel 1	Dry
Miller, Miller & Co. 1	Dry
Miller, American N. Gas 1	Gas
Ingomar—	
Schwenderman, Chartiers Oil 3	Gas
Berringer, McCullough & Co. 1	Gas
Pearce hrs., J. T. Williams & Co. 1	Gas
Duff City—	
Economy tract, C. S. Blakeslee & Co. 86	Gas
Berringer, Pittsburgh Oil & Gas 1	Gas
Beaver County—	
Gallagher, Butler parties 1	Dry
Milltown—	
Snively, South Penn Oil M. D. 1	Dry
Mt. Morris—	
Garrison, J. L. Garard & Co. 27	Dry
Keener Bros., J. L. Garard & Co. 3	Dry
Strosnider, Peoples Gas 1	Gas
Riggs, Manufacturers L. & H. 1	Gas
Dry	8
Gas	11

WEST VIRGINIA.

Mannington—	
Gum, Hope Gas 3	Gas
Hughes, Reserve Gas 1	Gas
Saddler, Wayland Oil & Gas 1	Dry
J. S. Baker, Blackshere Oil & Gas 1	Dry
H. E. Baker, Blackshere Oil & Gas 1	Dry
Hall, South Penn Oil 4	Dry
Vanhorn, Hope Gas 1	Gas
Chapman, Hope Gas 1	Gas
H. Chapman, Hope Gas 1	Gas
Dotson, I. O. & G. P. 1	Gas
Dotson, I. O. & G. P. 2	Gas
McDonald, Hope Gas 1	Gas
Harper hrs., Manufacturers L. & H. 2	Gas
Blackshere, Carnegie Gas 1	Gas
BcKinney, Carter Oil 1	Gas
Wells, Carnegie Gas 3	Gas
Maple, S. N. Elliott 2	Gas
Freeland, Eastern Pet. 1	Gas
Fox, South Penn Oil 8	Gas
Wetzel and Tyler—	
Teagarden, Manufacturers L. & H. 4	Gas
Riggs, Manufacturers L. & H. 1	Gas
Haught, Manufacturers L. & H. 1	Dry
Taggart, A. O. D. 5	Dry
Mills, Pittsburgh & W. Va. Gas 1	Gas
Ice, Hope Gas 3	Gas
Peterson, Hope Gas 29	Gas
Keller, C. L. McIntyre 1	Gas
Brooke County—	
Kirchner, Rockledge Oil 3	Dry
Horton, W. Va. Pet. 1	Dry
Ritchie County—	
Volcano tract, Power Oil 101	Dry
Newbrough, Open West Oil 2	Dry
Layfield, Southern Oil 3	Dry
Wilson, Hope Gas 2	Gas
Jones, Hope Gas 2	Gas
Bayne, Carnegie Gas 1	Dry
Minnear, Carnegie Gas 1	Gas
Chapman, Carnegie Gas 1	Gas
Wirt County—	
McCauley, R. Wardrop 1	Dry
Pleasants County—	
Riggs Bros., L. C. White & Co. 10	Dry
Riggs Bros., Newell & Co. 6	Dry
Hammett, Hope Gas 4	Dry
Calhoun County—	
Barnett, Hope Gas 1	Gas
Wilson, Hope Gas 1	Gas
Ferrell, G. L. Cabot 1	Gas
Marks, Federal Oil 6	Dry
Roane County—	
Simmons, United Fuel Gas 1	Dry
Kanawha County—	
Sunday Creek Coal, U. F. G. 8	Gas
Sunday Creek Coal, U. F. G. 10	Dry
Lewis, Libby-Owens Glass 3	Dry
Marnett Coal, Libby-Owens Glass 5	Gas
Bokers, K. V. P. 8	Dry
Moore, G. L. Cabot 3	Gas
Sunday Creek Coal, G. L. Cabot 1	Dry
Boone County—	
King, South Penn Oil 1	Dry
Cabell County—	
Pullen, Wayland Oil & Gas 1	Dry
Dry	24
Gas	31

SOUTHEASTERN OHIO.

Perry County—	
Schmeltzer Jr., Carter Oil 1	Dry
Hocking County—	
Reinscheild, Terra Cotta 7	Dry

Truth is within ourselves.—Browning.

Vickroy, Terra Cotta 1 ..... Dry
Miller, Union Furnace Prod. 1 ..... Dry
Muskingum County—
Mattingly, Carter Oil 1 ..... Gas
Athens County—
Sloan, Sayer & Co. 1 ..... Dry
Morgan County—
Bailey, Henne Oil 24 ..... Dry
Mosier, Burns & Co. 21 ..... Dry
Dale, H. E. Smith 237 ..... Gas
Noble County—
Craft, Ohio Fuel Supply 1 ..... Gas
Blake, G. C. Best Jr. 19 ..... Dry
Marietta—
Angelo Carter Oil 2 ..... Dry
Anderson, Wright & Loper 1 ..... Dry
Harrison, Beardmore O. & G. 3 ..... Dry
Hanlon, Hill Top Oil & Gas 2 ..... Gas
Stone, VanWormer & Co. 1 ..... Gas
Harris, Earle Stephens 2 ..... Gas
Lowry, Earle Stephens 2 ..... Dry
Male, D. A. Shinn 6 ..... Dry
Shook, Squire Bros. 1 ..... Dry
Marsh, Royal Oil & Gas 4 ..... Dry
Beardmore, Penn-Ky. O. & G. 3 ..... Dry
Carroll County—
Slates, Eaton & Co. 10 ..... Dry
Harrison County—
Bringham, Home Co. 1 ..... Gas
Guthrie, Winner Oil & Gas 1 ..... Gas
Graham, American Gas 1 ..... Dry
Mays, Ohio Cities Gas 1 ..... Dry
Mills, Home Co. 1 ..... Dry
Hines, Petroleum Oil & Gas 1 ..... Dry
Columbiana County—
Stottler, J. C. Nevins & Co. 1 ..... Dry
Belmont County—
Hunt, Pearsol & Co. 1 ..... Dry
Thompson, Natural Gas of W. Va. 1 ..... Gas

Dry 23
Gas 9

PENNSYLVANIA FIELDS.

SUMMARY OF OPERATIONS.

	Comp.	Prod.	Dry	Gas
Allegany	18	26	1	1
Bradford	54	133	2	0
Middle Field	19	25	0	1
Venango-Clarion	51	164	5	2
Butler-Armstrong	17	32	3	1
S. W. Penna.	34	119	8	11
West Virginia	131	3,592	24	31
S. E. Ohio	101	732	23	9
Total	425	4,823	66	56

CENTRAL OHIO.

KNOX COUNTY.

Pike—Albert Doup, Upham Gas 1 ..... Gas
Harrison—Hapgood, Ohio Fuel Supply 1 ..... Dry

ASHLAND COUNTY.

Hanover—W. H. Wolfe, Ohio Fuel Sup. 2 ..... Dry

MEDINA COUNTY.

Harrisville—Shilling, Logan G. & F. 1 ..... Gas
Brunswick—Fordham, Medina G. & F. 4 ..... Gas
Homer—F. Freeman, Ohio Fuel Supply 1 ..... Dry
Hinckley—Carpenter, Ohio Fuel Supply 1 ..... Gas
Lafayette—W. H. Minch, Ohio F. S. 1 ..... Gas
W. B. Chapman, Logan Gas & Fuel 1 ..... Gas

Dry 1
Gas 5

WAYNE COUNTY.

Cannan—Holloway, Logan Gas Fuel 1 ..... Gas
Joel Holmes, Ohio Fuel Supply 2 ..... Gas
Wm. Armstrong, Ohio Fuel Supply 2 ..... Gas
Geo. A. Smith, Ohio Fuel Supply 2 ..... Gas
Wayne—M. & H. Warner, Ohio F. Sup. 1 ..... Gas
Clinton—E. Smetzer, East Ohio Gas 2 ..... Gas
P. R. Odell, East Ohio Gas 1 ..... Dry
W. D. Morris, East Ohio Gas 1 ..... Dry
M. E. Eddy, East Ohio Gas 3 ..... Gas
C. S. Westall, Plymouth O. & G. 2 ..... Dry
Chippewa—F. S. Lands, East Ohio Gas 1 ..... Dry

Dry 4
Gas 7

RICHLAND COUNTY.

Monroe—Snyder, Ohio Fuel Supply 1 ..... Gas
Worthington—Smith-McCreedy, Logan G. & F. 2, 3 Gas

Gas 3

CUYAHOGA COUNTY.

Dover—J. & A. Sunk, Logan Gas & Fuel 1 ..... Gas
H. E. Mallie, Logan Gas & Fuel 1 ..... Gas
C. McCauley, Preston Oil 1 ..... Gas
J. Clemens, East Ohio Gas 1 ..... Gas
H. Airing, East Ohio Gas 1 ..... Gas
A. L. Ingersoll, Melrose O. & G. 1 ..... Dry

Dry 1
Gas 5

VINTON COUNTY.

Richland—G. Remy, Ohio Fuel Supply 1 ..... Gas
T. Patterson, Ohio Fuel Supply 1 ..... Gas
Jane Wortman, Ohio Fuel Supply 3 ..... Gas
I. Harper, Ohio Fuel Supply 2 ..... Gas
S. F. Nihart, Ohio Fuel Supply 1 ..... Gas
Harrison—Burt, Ohio Fuel Supply 1 ..... Gas
R. T. Hill, Ohio Fuel Supply 1 ..... Dry
Elk—I. M. Lantz, Ohio Fuel Supply 3 ..... Gas
P. M. Clark, Logan Gas & Fuel 1 ..... Gas

Dry 1
Gas 8

PERRY COUNTY.

Thorn—P. Starkey, Ohio Fuel Supply 1 ..... Dry
G. B. Stevens Ohio Fuel Supply 1 ..... Gas
J. Burket, Heisey Gas 2 ..... Dry
D. Foster, Heisey Gas 2 ..... Gas

Dry 2
Gas 2

HOCKING COUNTY.

Salt Creek—Shappell, Logan G. & F. 1 ..... Gas
R. Kennedy, Ohio Fuel Supply 1 ..... Gas

Gas 2

HOLMES COUNTY.

Washington—Weimer, Logan G. & Fuel 1 ..... Dry
Ed. Weimer, Logan Gas & Fuel 1 ..... Gas
J. B. Snively, Logan Gas & Fuel 1 ..... Gas

Dry 1
Gas 2

COSHOCTON COUNTY.

Newcastle—Lawrence, Logan G. & F. 1 ..... Gas

JACKSON COUNTY.

Washington—I. Washburn, Ohio F. S. 1 ..... Gas

Though the office seldom seeks the man, the job frequently does—and without success.

CENTRAL OHIO.

SUMMARY OF WORK.

	Comp.	Prod.	Dry	Gas
Licking	0	0	0	0
Fairfield	0	0	0	0
Knox	2	0	1	1
Ashland	2	3	1	0
Medina	9	20	1	5
Lorain	0	0	0	0
Wayne	14	215	4	7
Richland	3	0	0	3
Cuyahoga	6	0	1	5
Vinton	9	0	1	8
Perry	4	0	2	2
Hocking	2	0	0	2
Holmes	3	0	1	2
Coshocton	1	0	0	1
Jackson	1	0	0	1
Total	56	238	12	37

LIMA FIELD.

WOOD COUNTY.

Middleton—Cobley, Home Savings Bank 2 ..... Dry

AUGLAIZE COUNTY.

Pusheta—C. Harpst, Krin Chain Co. 2 ..... Dry

LIMA FIELD.

SUMMARY OF COMPLETED WORK.

	Aug. '18.			July, '18.		
	Comp.	Prod.	Dry	Comp.	Prod.	Dry
Wood	13	237	1	10	286	0
Hancock	6	81	0	8	43	1
Allen	4	30	0	3	30	0
Auglaize	5	36	1	7	40	1
Sandusky	3	30	0	4	16	0
Mercer	2	15	0	3	28	1
Van Wert	5	70	0	5	88	0
Seneca	5	92	0	3	20	2
Lucas	0	0	0	1	0	1
Ottawa	4	47	0	5	33	0
Wyandot	0	0	0	1	0	1
Williams	0	10	0	1	10	0
Fulton	0	0	0	1	0	1
Total	47	638	2	52	594	8

INDIANA FIELD.

WELLS COUNTY.

Chester—F. Twibell, Jackson & Co. 1 ..... Dry
I. J. Kirby, Smith & Smith 1 ..... Dry

Dry 2

JAY COUNTY.

Jackson—Whitson, Sandage & Co. 1 ..... Dry

HUNTINGTON COUNTY.

Salamonie—Gephart, March Pet. 1 ..... Dry

DELAWARE COUNTY.

Liberty—L. H. Holloway, Geo. D. Roberts 9 ..... Dry

RANDOLPH COUNTY.

Monroe—B. F. Hill, W. H. Mitchell 4 ..... Dry

GIBSON COUNTY.

Patoka—A. Embree, Lash & Embree 1 ..... Dry

PIKE COUNTY.

Madison—L. Johnson, M. Murphy est. 1 ..... Dry
W. E. Lamb, Oliphant & Riggs 2 ..... Dry
C. Burkhart, A. B. Bement & Co. 2 ..... Dry
Logan—F. M. McGillim, Indian Refg. 2 ..... Dry

Dry 4

SULLIVAN COUNTY.

Turman—W. H. Bicknell, Gambill & Co. 1 ..... Dry
Gill—W. H. Hoseman, E. R. Riggs 4 ..... Dry

Dry 2

MADISON COUNTY.

Pendleton—Custer, Pendleton N. G. 1 ..... Gas

INDIANA FIELD.

SUMMARY OF COMPLETED WORK.

	Aug. '18.			July, '18.		
	Comp.	Prod.	Dry	Comp.	Prod.	Dry
Wells	3	5	2	1	20	0
Blackford	1	5	0	0	0	0
Jay	2	5	1	2	5	1
Adams	1	10	0	1	8	0
Grant	0	0	0	2	5	1
Huntington	2	15	1	5	85	2
Delaware	2	100	1	1	40	0
Randolph	4	11	1	0	0	0
Gibson	1	0	1	7	2	6
Pike	5	80	4	14	239	5
Sullivan	2	0	2	4	43	2
Allen	1	3	0	0	0	0
Madison	1	0	1	0	0	0
Total	25	234	14	37	447	17

KENTUCKY-TENNESSEE.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry	Gas
Wayne	2	0	2	0
Wolfe	9	135	2	0
Lawrence	1	10	0	0
Estill	44	287	6	0
Powell	13	87	3	0
Lee	82	3,238	5	0
Allen	24	740	3	1
Bath	2	0	2	0
Warren	3	25	1	0
Barren	4	100	0	0
Lincoln	2	20	0	0
Magoffin	2	0	0	2
Pulaski	1	0	0	1
Clark	1	0	1	0
Grayson	1	15	0	0
Carter	1	0	1	0
Breathitt	3	40	1	0
Simpson	1	5	0	0
Jackson	6	75	0	0
Fleming	1	0	1	0
Adair	2	10	0	0
Green	1	0	1	0
Elliott	1	0	1	0
Menifee	1	5	0	0
Total	208	4,792	30	4

ILLINOIS FIELD.

	Aug. '18.			July, '18.		
	Comp.	Prod.	Dry	Comp.	Prod.	Dry
Clark	7	78	0	8	34	3
Crawford	32	399	13	16	277	3
Lawrence	7	198	2	12	565	3
Clinton	0	0	0	2	0	2
Marion	1	0	1	0	0	0
Wabash	1	0	1	3	90	1
Coles	1	0	1	2	0	2
McDonough	0	0	1	3	12	0
Total	49	575	19	46	978	14

Don't be afraid of criticism; criticism is the greatest educator in the world.

KANSAS.

BUTLER COUNTY.

Towanda—
14-26- 4, Shriver, Empire Gas & Fuel 6 ..... Dry
2-26- 4, Paulson, Empire Gas & Fuel 46..... Dry
12-26- 4, Enyart, Paragon Oil 15 ..... Dry
10-26- 4, Orban, Carter Oil 1..... Dry
24-26- 4, Clark, Central West 3 ..... Dry
1-26- 4, Porter, Carter Oil 42 ..... Dry
22-26- 4, Shreeves, Liberty Walker Oil 1 ..... Dry

El Dorado North—
2-25- 5, Guinn, Gypsy Oil 4 ..... Dry
5-25- 5, Dunkle, Ramsey et al. 5..... Dry
27-25- 5, Draper, Skelly & Boles 18 ..... Dry
8-25- 5, Wilson, Empire Gas & Fuel 107 ..... Dry
23-26- 5, Mossman, Carter Oil 1..... Dry

Augusta and Douglas—
4-27- 4, Hammond, Cosden Oil & Gas 1..... Dry
21-27- 4, Foster, Magnolia Pet. 3..... Dry
23-28- 4, Shoebe, Mid-Kansas Gas 1..... Gas
6-29- 4, Wilford, Monitor O. & G. 3..... Dry
7-29- 4, Cline, Standish Oil 1 ..... Dry
22-28- 4, Brown, Parker et al. 6..... Gas
27-28- 4, Martin, Gordon Heights Oil 2..... Gas
7-29- 4, Holwood & Hyde, Holwood Oil 4..... Gas
4-20- 4, Hartenbower Liquid Wealth Oil 1 ..... Dry
8-27- 4, Knollenberg, Peoples O. & G. 1..... Dry
3-29- 4, Minor, Mid-Kansas Oil 15 ..... Dry

Miscellaneous—
30-29- 6, Haver, National Refg. 1 ..... Gas
25-24- 3, Joseph, Snowden Bros. 2..... Dry
13-29- 3, White, Empire Gas & Fuel 1 ..... Gas
25-28- 5, Hill, Hancock et al. 1..... Dry
30-29- 6, Ray, Schuler, et al. 1..... Dry
33-25- 8, Jahren, Independent Oil 1..... Dry
4-25- 6, Case, Sunshine Drg. 1..... Dry
17-24- 7, Ketzelman, Horton et al. 1..... Dry

Dry 25
Gas 6
Gas Production 5,000,000

CHAUTAUQUA AND ELK COUNTIES.

20-33-12, Connors, P. O. & G. 3..... Dry
32-32-12, McKee, Stryker et al. 4..... Gas
17-31-13, Carnie, Oak Valley Oil & Gas 1..... Dry
22-32-12, McKee, Stryker et al. 5..... Gas
23-32-12, Fee, May S. Holliday 14 ..... Gas
31-31-13, Sinnotte, Willis Bos. 4..... Gas
32-32-14, Good, Berry & Tucker 1 ..... Dry
27-31-12, Caster, Keefe & Morrison 2 ..... Gas
4-34-11, Casement, Superior Oil & Gas 1..... Dry
22-32-12, McKey, Longco Oil 1 ..... Gas
22-32-12, McKey, Longco Oil 2 ..... Gas
22-32-12, McKey, Longco Oil 3 ..... Gas
17-31-13, Harris, Oak Valley 1 ..... Gas
31-31-13, Hawley, Willis Bros. 4 ..... Gas
24-31-12, Fee, Mary Holliday 12 ..... Gas
30-31-12, Compton, Parsons parties 1 ..... Dry
30-31-12, Compton, Parsons parties 2 ..... Dry
11-31-12, Wicker, Connolly & Bowser 1..... Dry
27-31-13, Simmons, Keefe & Morrison 2..... Gas
20-32-14, Woody, Dover Oil 9 ..... Dry
31-31-13, Lugenbiel, Mayflower Oil 1 ..... Gas
27-32-12, McKey, Stryker 6 ..... Gas
7-33-10, Metcalf, Sachem Oil 1..... Dry
36-34- 8, Holroyd, Marcell et al. 1..... Dry
21-33-11, Thompson, Ernest Oil 1 ..... Dry

Dry 11
Gas Wells 14
Gas Production 30,000,000

MONTGOMERY COUNTY.

35-33-14, Hudson, Franklin O. & G. 1..... Dry
31-32-15, Wiltse, J. F. Overfield 11 ..... Dry
5-35-15, Shadley, Panama Crude Oil 6 ..... Dry
28-34-15, Jabben, Geo. Jabben et al. 1..... Dry
35-35-15, Taylor, Keystone United Oil 9..... Dry
36-32-14, Inscho, W. F. Potter 9 ..... Gas
36-33-14, Beam & Whitney 19 ..... Dry
9-34-14, Freeman, Chidester & Raydure 9 ..... Dry
34-33-14, Taylor, E. Reinbold 1 ..... Dry

Dry 8
Gas 1
Gas Production 1,000,000

WILSON COUNTY.

17-29-17, Allen, Espain & Karnes 1 ..... Gas
17-29-17, Davis, Karns & Aspin 2..... Dry

ALLEN COUNTY.

33-26-16, Gear, Union Central Oil 3..... Dry
14-26-18, Yockhart, Elkmuck Oil 7 ..... Dry
12-27-18, Kelly, Mutual Oil 1 ..... Dry
23-26-18, Pugh, Prudential Pet. 12..... Dry
3-26-18, Latzbach, Houston & Okla. Oil 1.....? Dry
9-26-17, Krueger, Prudential Oil 4..... Dry

Dry 6

NEOSHO COUNTY.

21-28-18, Converse, Moore Bros. & Loy 2..... Dry
27-27-19, Krueger, Kennedy et al. 3..... Gas
9-27-18, Houston, Swanson Bros. & Kelly 12..... Dry
23-27-18, Trammell, J. H. Evans et al. 6..... Dry
12-27-18, Smith, Red Rock Oil 1..... Dry
2-28-18, Fee, C. W. Spangler 2 ..... Dry
14-27-19, Cook, L. S. Cambern 2 ..... Dry
14-27-19, McKee, Van Camp Oil 1..... Dry
27-27-19, Krueger, Kennedy Oil 2..... Gas

Dry 7
Gas Wells 2
Gas Production 1,500,000

MIAMI, FRANKLIN AND DOUGLAS COUNTIES.

9-17-23, Clarke, McLaughlin, et al. 7..... Dry
8-17-22, McCullough Morgan et al. 1..... Dry
11-15-20, Dyer, Alfloma Oil 2 ..... Dry
2-16-21, Baderiff, R. O. S. Oil 3..... Dry
11-16-20, Heckman, Gardner Dome 1 ..... Gas
17-17-23, Green, Victor Swanson 1 ..... Dry
4-17-23, Wells, Root Penman Oil 7..... Dry
9-17-23, Durner, Dr. Travis et al. 5..... Dry
2-20-20, Hesart, E. M. Armedo 1 ..... Dry
17-16-21, Burnett, Elm Tree Oil & Gas 8..... Dry
36-16-20, Idster, Wellington-Wellsville 5 ..... Gas
11-16-20, Heckman, Gardner Dome Oil 2..... Gas

Dry 9
Gas 3
Gas Production 3,000,000

WILDCATS.

Cowley County—
10-30- 3, Carleton, Elwell et al. 1..... Dry
12-30- 7, Rudolph, Deering Marshall 1 ..... Dry

Greenwood County—
35-27 8, Edgar, Wichita Natl. Gas 1..... Dry
33-25- 8, Jackson, Mid-Kansas Oil 1..... Dry
2-26- 8, Hull, Gt. Southern-Tidal 6 ..... Dry
12-26- 8, Vose, Flint Pet. 1..... Dry
1-23-12, Richardson, Warner et al. 1..... Dry
27-24-12, Troxwell Willow Creek Oil 2..... Dry
27-24-12, Shoet, Rock Island Oil 1..... Dry
1-23-12, Richardson, Warner et al. 1..... Dry
30-24-12, Ainswo th, Mouser et al. 1..... Dry
29-22-12, Ba nard, Warner et al. 1..... Dry
30-24-12, Ainsworth, Hogan et al. 2..... Dry

Woodson County—
5-25-14, Kimball, Mollohan & Scott 1 ..... Dry
27-25-15, Pingrey, Joseph et al. 1..... Gas

People do not lack strength; they lack will.—Victor Hugo.

26-25-14, Boyer, Davis et al. 2 ..... Gas
Anderson County—
2-20-20, Hastert, E. M. Arnold 1 ..... Dry
3-20-20, Blum, Blum Drilling 1 ..... Dry
Elk County—
13-21-10, Walker, Combined Oil & Gas 1 ..... Dry
Bourbon County—
23-17-32, Christy, H. E. Kelly 2 ..... Dry
23-17-22, Christy, H. E. Kelly 1 ..... Dry
18-26-23, Mason, A. J. Francis 1 ..... Dry
4-26-23, Bolinger, H. M. Horner 1 ..... Dry
Osage County—
5-21-16, Penn. Okla. and Kansas Oil 1 ..... Dry
Reno County—
10-23-5W, Price, Partridge Oil 1 ..... Dry
Smith County—
28-3-14W, Williams, Manhattan Oil 1 ..... Dry

Dry 24
Gas 2
Gas Production 2,500,000

OKLAHOMA.

WASHINGTON COUNTY.

Bartlesville, Etc.—
30-26-13, Knipe, Delokee Oil 5 ..... Dry
24-28-13, Fee, P. O. & G. 51 ..... Dry
21-28-13, Walker, Catlett & Davis 5 ..... Dry
32-28-13, Fields, Wirt Fields 7 ..... Dry
8-26-13, Chestnutt, Invaders Oil 11 ..... Dry
26-25-12, Uncophen, Foster & Hall 1 ..... Dry
25-26-14, Bank, T. C. Bruere, agt. 4 ..... Dry
26-27-13, Fee, Dewey Port. Cement 8 ..... Dry
15-26-13, Feather, Dewey Portland C. 1 ..... Gas
8-25-14, Morrison, K. C. people 1 ..... Dry
13-28-12, Wilson, Owen & Connelly 1 ..... Dry
26-25-12, Degan, Nathine & Degen 2 ..... Dry
35-28-13, Rigdon, U. S. Oil 4 ..... Dry
4-26-13, Yurlin, H. F. Stryker 1 ..... Gas
26-27-13, Armstrong, J. F. Crosbie et al. 11 ..... Dry
8-28-14, Day, Seamons Oil & Gas 3 ..... Dry
27-27-13, Williams, Martin-O'Connor 2 ..... Dry

Dry 15
Gas Wells 2
Gas Production 2,500,000

OSAGE COUNTY.

12-23-11, C. K. Dresser 1 ..... Gas
17-27-10, Texas Co. ..... Dry
7-23-11, Texas Co. 1 ..... Gas
16-23-11, Wrightsman et al. ..... Gas
34-22-12, Andes Oil & Shea 7 ..... Dry
1-27-10, Owen & Osage 28 ..... Gas
27-24-11, Manhattan Oil 71 ..... Dry
20-23-12, Savoy Oil 2 ..... Dry
36-27-11, Sterling Oil 1 ..... Dry
2-27-10, Owen & Osage Natl. Gas 30 ..... Gas
15-20-11, Tidal Oil 2 ..... Dry
34-21-12, Andes Oil 7 ..... Dry
33-23-11, Kewanee Oil 12 ..... Gas
15-20-12, Producers Oil 2 ..... Dry
33-23-11, Finance Oil 27 ..... Gas
20-21-10, Texas Co. 1 ..... Dry
35-24-8, Santona Oil 2 ..... Gas
25-24-8, Texas Co. 4 ..... Dry
10-20-12, Lot 107, C. W. Titus 9 ..... Dry
32-25-11, Lot 287, Jackson & Wise 1 ..... Gas
34-22-12, C. W. Titus 7 ..... Dry
24-26-11, Damon Oil 1 ..... Dry
14-21-10, Okla. & Osage Gas 233 ..... Dry
13-24-9, Indian Territory Ill. Oil 220 ..... Gas
13-24-9, Finance Oil 1 ..... Dry
6-24-8, Pawhuska Oil & Gas 26 ..... Dry
13-24-9, Finance Oil 1 ..... Dry
11-25-11, Phillips Pet. 39 ..... Dry
34-27-11, A. M. Landon 5 ..... Dry
20-27-11, Carter Oil 5 ..... Dry
8-26-11, Indian Territory Oil 2 ..... Gas
34-22-12, Osage & Okla. 1 ..... Gas
9-23-12, Paragon Oil 1 ..... Gas
27-22-12, Magnolia Pet. 14 ..... Dry
34-2-12, Osage Natural Gas 235 ..... Gas
14-21-10, Osage & Okla. Gas 233 ..... Dry
16-23-8, Acacia Oil 1 ..... Gas
3-25-10, Standish Oil 1 ..... Dry
21-25-11, Manhattan Oil 46 ..... Gas

Dry 23
Gas 16
Gas Production 90,000,000

NOWATA AND ROGERS COUNTIES.

Cherokee Shallow—
17-23-17, Jones, W. V. Harper 2 ..... Dry
11-24-17, Danenburg, Gay & Laughner 3 ..... Dry
20-26-15, Kulchinski, J. J. Riner 8 ..... Dry
19-26-15, Harelson, Arosmith et al. 2 ..... Dry
29-26-15, Zelgar, Arrowsmith & Co. 1 ..... Dry
14-26-13, Janzen, H. C. Campbell 1 ..... Dry
21-17-16, Wilson, Atlas Pet. 2 ..... Dry
3-25-15, Grash, 25 Oil 1 ..... Dry
7-22-16, Payne, E. V. Fischer 1 ..... Dry
14-25-14, Edwards, H. C. Campbell 9 ..... Dry
21-27-16, Fever, Atlas Pet. 3 ..... Dry
29-28-15, Chocteau, Boesche et al. 1 ..... Dry
8-28-14, Davis, Seaman Oil 3 ..... Dry
7-25-16, Ringo, Osceola Oil 1 ..... Dry
17-23-17, Jones, W. V. Harner 7 ..... Dry
17-23-17, T. Jones, W. V. Harner 2 ..... Dry

Dry 16

TULSA COUNTY.

Red Fork and Sand Springs—
20-19-11, Barker, Campbell & Barker 1 ..... Gas
5-19-11, Mitchell, Phoenix Refg. 4 ..... Dry
10-20-11, Sand Springs Home 1 ..... Gas
29-19-11, Payne, Producers Oil 3 ..... Gas
20-19-11, Thomas, M. J. Parker et al. 2 ..... Gas
33-19-12, Beef, National Oil 12 ..... Dry
Bird Creek, Skiatook, etc.—
32-22-14, Kegg, Tulsa Fuel 1 ..... Gas
7-20-13, Barnes, E. A. Ross et al. 3 ..... Dry
25-20-14, Timmons, Bevo Oil 2 ..... Dry
6-23-13, McPherson, Texas Co. 4 ..... Dry
35-21-14, Franks, Clark et al. 1 ..... Gas
6-23-14, McPherson, Texas Co. 3 ..... Dry
27-22-12, Dermission, Magnolia Pet. 14 ..... Dry
15-20-12, Lot 109, Texas Co. 2 ..... Dry
36-20-13, Avery, Hajo Oil 11 ..... Dry
Broken Arrow and Jenks—
35-17-12, Martin, Monitor Oil & Gas 1 ..... Dry
11-16-12, Burnett, Cosinas Oil & Gas 3 ..... Dry
13-18-14, Boles, Gypsy Oil 1 ..... Dry
19-16-12, Bruner, A. L. Morgan 1 ..... Gas
Bixby and Leonard—
18-17-13, Berryhill, Central States Oil 2 ..... Gas
15-16-13, Tiger, Gladys Oil 7 ..... Dry
21-17-14, Steele, Ardizzone & Braden 2 ..... Gas
21-16-13, Big Pond, Tuxedo Oil ..... Dry
8-16-13, Frank, J. Winemiller 2 ..... Dry
29-17-13, Berryhill, Marshall & Simons 3 ..... Dry
1-16-13, Johnson, Coffeyville O. & G. 2 ..... Dry
15-17-13, Berryhill, Hull & Bradstreet ..... Dry
3-16-14, Deere, Hornecker 1 ..... Dry
35-16-13, White, Tammany Oil 6 ..... Gas
32-17-13, Rogers, Hereford et al. 6 ..... Dry

Dry 20
Gas Wells 10
Gas Production 40,000,000

The only power is thought; the only wealth is knowledge; the only progress is education.

OKMULGEE COUNTY.

Youngstown and Tiger Flats—
25-14-11, Doyle, Amalgamated Oil 3 ..... Dry
4-14-11, Walker, P. & R. Corporation ..... Gas
25-14-11, McIntosh, C. B. Shaffer 2 ..... Gas
17-13-12, Lyman, Pine et al. 1 ..... Gas
23-13-12, Morton, J. G. Lyons et al. 1 ..... Dry
26-13-12, McIntosh, J. H. Rebold et al. 2 ..... Gas
20-12-12, Wilson, Twin States Oil 9 ..... Dry
3-12-11, Prairie Oil & Gas 1 ..... Dry
7-13-12, Grayson, Alexander et al. 2 ..... Gas
9-13-12, Brinton, Bradstreet et al. 2 ..... Gas
24-14-11, Reed, Savoy Oil 1 ..... Dry
25-14-11, Fee, Barbara Oil 2 ..... Dry
9-13-12, Brinton, Bradstreet et al. 3 ..... Dry
25-14-11, Nubbie, Gypsy Oil 2 ..... Dry
25-14-11, Clark, Barnara Oil 2 ..... Dry

Bald Hill and Booch Sand—
9-14-14, Stevens, Sequoyah Oil & Refg. 10 ..... Dry
4-14-14, Miller, J. W. Moore 3 ..... Dry
21-14-14, Grayson, Sperry Oil & Gas 14 ..... Dry
1-14-13, Rentie, Braniger & McGinley 1 ..... Dry
6-14-13, Berryhill, Georgia Pet. 1 ..... Dry
32-14-13, Gibson, Patterson et al. 2 ..... Dry
1-14-13, Sibert, Braniger Oil 5 ..... Dry
31-16-15, Rowe, Three S. Oil 22 ..... Dry
29-14-14, Brian, Z T Graham 8 ..... Dry
29-14-14, McKinney Z. T Graham 8 ..... Dry
4-14-14, Miller, J. W Moore e al. 3 ..... Dry
33-15-14. Monday, nvaders Oil 4 ..... Dry
2-14-14, Phillips, Ernest Price 3 ..... Dry
2-14-13, Sharpe, E. Price 4 ..... Dry

Mounds—
35-16-11, Leath, Texas Co. 1 ..... Gas
36-16-11, Clayton, Owatoma Oil 4 ..... Dry
15-16-11, Clark, Rock Island Oil 3 ..... Dry
23-16-11, Wolf, Geo. Howard 4 ..... Dry
22-16-11, Jones, Odelot Oil 1 ..... Gas
23-16-11, Crosby Drilling 2 ..... Dry
12-16-12, Berryhill, Smith, Tucker et al. 1 ..... Dry
19-16-12, Bruner, A. L. Morgan 1 ..... Gas
15-16-13, Tiger Gladys Oil 7 ..... Dry
26-16-11, Letcher Sperry Oil & Gas 1 ..... Dry
13-16-11, Welsh, Winemiller 5 ..... Dry
31-16-12, Sharp, Kawfield Oil & Gas 2 ..... Dry
10-16-11, Pickett, Wiser Oil 5 ..... Gas

Hamilton Switch and Beggs—
11-14-10. Fixico, H. F. Wilcox ..... Dry
2-14-12, Tiger, Bryan et al. 1 ..... Dry
25-14-12, L. S. Skelton et al. 1 ..... Dry

Okmulgee and Morris—
20-13-13, Brown, Monitor Oil & Gas 1 ..... Dry
19-13-14, Willis, Pine & Butler 3 ..... Dry
32-13-14, Beaver, Iron Mountain Oil 3 ..... Dry
32-13-14, Moore Test Oil 2 ..... Dry
19-13-14, Monday, Kingwood Oil 3 ..... Gas

Henryetta—
3-12-14, Sumsey, Burns & McInturff 1 ..... Dry
5-12-13, Holleyman, Kimbley et al. 1 ..... Dry

Dry	41
Gas Wells	11
Gas Production	110,000,000

MUSKOGEE, WAGONER AND ROGERS COUNTIES.

Catoosa—
35-21-14, Franks, Plumb Line Oil 1 ..... Gas
3-21-14, Allen, Ward et al. 3 ..... Dry
21-21-14, Murray, McDonald et al. 1 ..... Gas
25-21-14, Timmons, Bevo Oil 2 ..... Dry
7-22-15, Taylor, Dr. Enscho et al. ..... Dry
14-22-15, Hanes, Middle State Oil 2 ..... Gas
35-21-14, Frances, Plumb Line Oil 2 ..... Gas

East of Brown Arrow—
14-19-15, Phyllis Oil 1 ..... Dry
15-19-15, Bruner, Talbot et al. 3 ..... Dry
7-18-15, Presley, Bearman et al. 2 ..... Gas
21-18-15, Apueka, Oliver et al. 1 ..... Dry
8-18-15, Barnett, Webster et al. 2 ..... Dry
6-18-15, Presley, Bearman & Stalker 2 ..... Gas
19-18-15, Tiger, Webster et al. 6 ..... Dry

Coweta—
29-17-15, Atkins, Arnold et al. 5 ..... Dry

Haskell and Stone Bluff—
31-16-15, Asbury, B. G. Goble 2 ..... Dry
32-15-15, Vanderslice, Hanson O. & G. 1 ..... Dry
28-15-17, Taylor, Greenwood Oil 1 ..... Gas
28-15-17, Taylor, Greenwood Oil 2 ..... Gas
35-15-15, Harrison, Caney River Gas 6 ..... Dry
16-15-16, McIntosh, Peterson et al. 7 ..... Dry
34-16-15, Richards, Minnekota Oil 4 ..... Dry
36-15-15, Durant, Scully & Summers 8 ..... Dry
35-15-15, Harrison, Caney River Gas 5 ..... Dry
17-15-16, Banks, Billard & Mid-Co. 2 ..... Dry
30-16-15, Grayson, Presto Oil & Gas 1 ..... Dry
31-15-16, Charles, Penn-Wyoming Oil 1 ..... Dry
10-15-15, Jackson, Gillespie et al. 1 ..... Dry

Boynton and Cole Pool—
1-14-15, Franklin, Markham, Simons et al. 4 ..... Dry
1-14-15, Manuel, Gulick et al. 4 ..... Dry
25-15-15, Pouncil, Terriokla Oil 1 ..... Gas
2-14-15, Harrison, Iowa Okla Oil 6 ..... Dry
11-13-15, Sievers, Mary Oil & Gas 4 ..... Dry
18-14-16, D. Reed, Probst & Morrison 1 ..... Dry
1-14-15, Manuel, Gulick et al. 4. ..... Dry
11-14-18, Dyer Penn-Wyoming Oil 1 ..... Dry
3-14-15, McGilbray Minnekota Oil 5 ..... Dry
32-14-16, Lewis, Penn Wyoming Oil 1 ..... Dry

Muskogee and Miscellaneous—
6-13-19, Walker, Ocala Oil 1 ..... Dry
7-15-20, Benge, Southern Pet. 1 ..... Dry

Dry	31
Gas Wells	9
Gas Production	15,000,000

CREEK COUNTY.

Glenn Pool—
32-18-12, Wilcox, C. G. Tibbens 2 ..... Dry
32-18-11, Miller, New State Oil 1 ..... Dry
32-18-11, Miller, New State Oil 2 ..... Dry
24-18-11, Sapulpa, Okla. Dev. 2 ..... Gas
20-17-12, Whetstone, P. O. & G. 6 ..... Dry
27-17-12, Rogers, Minnehoma O. & G. 1 ..... Gas

Cushing and Olive—
12-18- 7, Sullivan, Gypsy Oil 1 ..... Gas
36-16- 7, Jones, Magnolia Pet. 1 ..... Gas
36-16- 7, Jones, Carter Oil 2 ..... Gas
35-19- 7, Cedar, McCray et al. 6 ..... Dry
16-19- 7, Cushing Development 1 ..... Dry
24-18- 7, Brown, C. B. Shaffer 1 ..... Gas
36-18- 7, Jones, Carter Oil 1 ..... Gas

West of Mounds—
11-16-10, Tilley, Gladys Belle Oil 1 ..... Dry
11-16-10, Bear, Gladys Belle Oil 1 ..... Dry
11-16-10, Scott, Aladdin Oil ..... Dry
2-16-10, Snow, Kingsmith Refg. 12 ..... Dry
4-16-10, Yon Con Tah Laney, Wilson 1 ..... Gas
11-16-10, Bear Aladdin Oil 1 ..... Dry
10-16-10, Roberson, Aladdin Oil 1 ..... Dry
14-14-10, Yargee, H. F. Wilcox 1 ..... Dry
14-15-10, Benson, Russell Bros. 1 ..... Dry
2-15- 9, Briscoe, Joe Abraham 1 ..... Gas

Mannford—
35-17-10, Snow, H. C. Wilson 2 ..... Dry
27-18- 9, Brown, Mountain State Oil 2 ..... Dry
1-17-10, Johnson, Bing & Bing 1 ..... Gas

Dry	16
Gas Wells	10
Gas Production	30,000,000

Cheer up. The less you have the more there is to get.

PAWNEE COUNTY.

Casey—
29-21- 6, Hensfield, J. H., Markham, Jr. 1 ..... Dry
11-21- 6, Hammer, Markham et al. 1..... Gas
31-21- 6, Berry, Carter Oil 1..... Dry
Skeedee—
31-23- 6, Young Chief, Devonian Oil 1..... Dry
Cleveland, Etc.—
21-28- 8, C. & D., Davis et al. 6..... Dry
18-17- 8, Tucker, P. O. & G. 1..... Dry
9-20- 8, Baker, A. M. Richards 1..... Dry

Dry 6
Gas Well 1
Gas Production 10,000,000

PAYNE COUNTY.

Yale, Quay, Etc.—
11-17- 6, Morgan, Border Queen O. & G. 2..... Dry
29-19- 6, Dale, Magnolia Pet. 1..... Gas
2-18- 5, Bushee, Middle State Oil 1..... Gas
3-18- 5, Ellis, Creek Co. Dev. 1..... Gas

Dry 1
Gas Wells 3
Gas Production 10,000,000

KAY COUNTY.

Blackwell, Newkirk, Etc.—
8-25- 2, Sits on the Hill, Marland et al. 6..... Dry
29-28- 1, Williams, Economy Oil 1..... Dry
14-27- 1, Wheeler, Cherokee Oil & Gas 1..... Dry
15-27-1W, Regain, Antelope Oil 1..... Dry
15-27-1W, Smitherman, Cherokee O. & G. 4..... Gas
15-27-1W, Derman, Independent Oil 1..... Dry
15-27- 1, Regain, Lucky Leaf Oil 1..... Dry
33-27-3E, Keene, Marland et al. 1..... Dry

Dry 7
Gas Wells 1
Gas Production 10,000,000

CARTER COUNTY.

Healdton, Etc.—
35- 2- 3, Lester, Humble Fox Oil 1..... Gas
3- 4- 3, Mathers, Iokla Oil & Gas 1..... Dry

Dry 1
Gas Wells 1
Gas Production 15,000,000

WILDCATS.

Pontotoc County—
26- 5- 8, Harjo, Homa Okla Oil 13..... Dry
27- 5- 8. Jackson, Homa Okla. Oil 2..... Gas
27- 5- 8, McCall, Kansas City Oil 12..... Dry
32- 5- 7, Oliver, Benedum & Trees 5..... Dry
27- 5- 8, Crabtree, Humble & Gypsy Oil 2..... Gas
Stephens County—
36-1S-5W, Martin, Simpson Oil 1..... Gas
9- 3- 5, Billy, Lone Star Gas 2..... Dry
11- 2- 4, Miller, Magnolia Pet. 1..... Dry
23- 2- 5, Harper, Eagle Falls Oil 1..... Gas
13- 2- 4, Burns, Plains Oil 2 ..... Dry
1- 1- 9, Johnson, Base Line Oil 1 ..... Dry
Oklahoma County—
33-14-1W, E. N. McGinley et al. 1..... Dry
Garfield County—
10-20-3W, Mitchell, P. O. & G. 1..... Dry
Cotton County—
23- 1-10, Gardner, Douglas & Parker 1..... Gas
24-1S-10W, Bickett, Magnolia Pet. 1..... Gas
14- 2-10, Neal, J. B. Lawson 1 ..... Dry
Caddo County—
2- 5N-9W, Wald, Gorton Oil & Refg. 1..... Gas
Jackson County—
1- 3-19W, Wright, La Barrance Oil 1..... Dry
Creek County—
15-14- 7, Tiger, P. O. & G. 1..... Dry
Okfuskee County—
8-12- 7, Rogers, P. O. & G. 1 ..... Dry
Beckham County—
14-9N-23W, Brady, March Oil & Gas 1..... Dry
Grady County—
13-6N-5W, Brown, Treasure State Oil 1..... Dry
Rogers Mills County—
24-12-21W, Thompson, Vian Dev. 2 ..... Dry
Bryan County—
1- 6- 8E, Fulton, Trice & Fitch 1 ..... Dry
Hughes County—
3- 5- 9, Stanley, Ada Petroleum 1 ..... Dry
22-11-12, Furr, Brink Oil ..... Dry
Noble County—
13-22- 2, Donahue Bros. 1..... Dry
Kay County—
26-28-1W, Higher Oil 1 ..... Gas

Dry 20
Gas Wells 8
Gas Production 40,000,000

KANSAS.

SUMMARY OF COMPLETED WELLS.

	Comp.	Prod.	Dry	Gas
Butler	162	23,225	31	6
Chautauqua-Elk	66	767	13	14
Montgomery	42	304	7	1
Miami-Franklin-Douglas	59	367	9	3
Wilson	24	130	1	1
Allen	23	224	5	0
Neosho	56	707	7	2
Wildcats	41	810	26	2
Total	473	26,534	99	29

OKLAHOMA.

SUMMARY OF WELLS COMPLETED.

	Comp.	Prod.	Dry	Gas
Osage	145	7,214	26	15
Washington	68	826	15	2
Nowata-Rogers	92	868	16	0
Tulsa	69	2,093	19	12
Creek	72	1,637	21	10
Muskogee-Wagoner-Rogers	78	3,003	35	9
Okmulgee	114	5,388	43	12
Pawnee	23	427	9	1
Payne	15	1,121	2	3
Kay	21	2,345	3	1
Garfield-Noble	22	2,602	1	0
Carter	14	480	1	1
Wildcats	59	595	29	3
Total	792	28,599	225	74

KANSAS-OKLAHOMA-ARKANSAS.

SUMMARY OF WELLS COMPLETED.

	Comp.	Prod.	Dry	Gas
Kansas	473	26,534	99	29
Oklahoma	792	28,499	225	74
Aakansas	4	0	3	1
Total	1,269	55,033	327	104

WYOMING.

33-46-98, Findlay P. C., Ohio Oil 2..... Dry
21-40-79, B. B. & S. C. R. P., Ohio Oil 2..... Dry

A man who has misgivings as to the future will never start.

16-57-98, Gov't land, D. J. Danker 1 ..... Gas

Dry 2
Gas 1
Gas Production 10,000,000

NORTH TEXAS.

WICHITA AND WILBARGER COUNTIES.

Granger, Nelson & Wright 1 ..... Dry
Bean, Frank Cullivan et al. 5 ..... Dry
Hanaker, Frank Cullivan et al. 61 ..... Dry
Cools, Gulf Production 2 ..... Dry
Burnett, Ray Jones 3 ..... Dry
Allingham, Hereford Oil 2 ..... Dry
Zeiset, Straugh & Co. 1 ..... Dry
Waggoner, Texas Co. 155 ..... Dry
Waggoner, Texas Co. 164 ..... Dry
Burnett, Linn & Co. 1 ..... Dry
Tremer, Slater & Co. 1 ..... Dry
Eads, Kemp & Ferris 1 ..... Dry
Bowers, Turlsey Creek Oil 1 ..... Dry

Dry 13

BURKBURNETT AND LOCALITY.

Birk, Miller et al. 2 ..... Dry
Davis, Prince Oil & Ref. 1 ..... Dry
Prechel, Texas Co. 1 ..... Dry
Fee, Hiserman & Co. 3 ..... Dry
Snow, Cooper & Co. 1 ..... Dry
Roddy, Tippett & Boady 1 ..... Dry
Croffer, Celina Oil & Gas 1 ..... Dry
Lerrin, Magnolia Pet. 3 ..... Dry
Honaker, Stovwall Brown 1 ..... Dry

Dry 9

CLAY COUNTY.

Holloway, Lone Star Gas 8 ..... Gas
Byers, Lone Star Gas 1 ..... Dry

Dry 1
Gas 1

EASTLAND COUNTY.

Underwood, System Oil 1 ..... Dry
Mann, Atlas Oil 1 ..... Dry

Dry 2

NORTH TEXAS.

SUMMARY OF COMPLETED WORK.

	Comp.	Prod.	Dry	Gas
Wichita	18	615	13	0
Burkburnett	34	6,655	9	0
Clay County	2	0	1	1
Eastland	7	6,420	2	0
Total	61	13,690	25	1

NORTH LOUISIANA.

CADDO.

4-20-15, Shropshire et al., Bird et al. ..... Gas
33-22-16, Browning, Savoy Oil 4 ..... Dry
23-21-15, Caddo M. L., Baker et al. 1 ..... Dry
Miscellaneous—Caddo—
24-17-14, Moore, Ark. Nat. Gas 71 ..... Dry
25-17-14, Levin, Texas Co. 1 ..... Gas
Morehouse—
34-21- 5, Fisher, Southern Carbon 2 ..... Gas
45-21- 6, Crossett Lmbr., Newblock et al. 2 ..... Gas
Ouachita—
27-19- 4, McEwen, Nelson Inc. 1 ..... Gas
8-19- 4, Philips, Texas Co. 1 ..... Gas
Texas—
Panola Co., Waterman Lbr., Texas Co. 2 ..... Dry
Panola Co., W. C. Augurs, Gulf Prod. 1 ..... Gas
Cass Co., Rand, Polonia Oil & Gas 1 ..... Dry
Marion Co., Benefield et al., Mutual Oil Assn. of Texas 1 ..... Dry

Dry 6
Gas Wells 7

NORTH LOUISIANA.

SUMMARY OF OPERATIONS.

	Comp.	Prod.	Dry	Gas
Caddo	36	15,570	2	1
De Soto	2	625	0	0
Red River	0	0	0	0
Bossier	1	75	0	0
Miscellaneous	6	0	1	5
Texas	5	15	3	1
Total	50	16,285	6	7

GULF COAST.

GOOSE CREEK.

Townsite, Buffalo Oil & Refg. 3 ..... Gas

HUMBLE.

Wheeler, Midland Securities 1 ..... Dry
Dunn, Barkley & Meadors 1 ..... Gas

JENNINGS.

Crowley, Southeastern Oil 1 ..... Gas

SOUR LAKE.

Rogers, Humble-Sour Lake Oil 1 ..... Dry

WEST COLUMBIA.

Arnold, Texas Co. 1 ..... Gas

GULF COAST.

SUMMARY OF OPERATIONS.

	Comp.	Prod.	Dry
Anse La Bute	0	0	0
Batson	6	2,170	0
Damon Mound	2	20	1
Edgerly	22	225	0
Goose Creek	34	6,600	14
Humble	45	1,215	16
Jennings	6	275	0
Markham	0	0	0
Spindletop	11	635	2
Saratoga	8	425	5
Sour Lake	14	2,205	4
Vinton	4	330	1
Piedras Pintas	3	35	0
New Iberia	0	0	0
Hull	2	2,000	1
W. Columbia	2	200	0
Miscellaneous	14	0	14
Total	153	16,335	59

TEXAS-LOUISIANA.

SUMMARY OF OPERATIONS.

	Comp.	Prod.	Dry	Gas
North Texas	61	13,690	25	1
North Louisiana	50	16,285	6	7
Gulf Coast	153	16,335	58	0
Total	264	46,310	89	8

The only real failure is the quitter.—Dynamo.

AROUND THE BELT

New Wells, New Pipe Lines, New Contracts, Additions and Extensions. A Fund of Valuable News Gathered for the Journal Through Many Sources.

TRADE PERSONALS

BECK, JOHN A., at the annual meeting of the Pavilion Natural Gas Company, Leroy, N. Y., was elected President.

HAMPTON, ROBERT S., has been re-elected President of the Frankfort Natural Gas Company, Frankfort, Ky.

HANSELL, W. P., has been elected Vice-President of the Pavilion Natural Gas Company, Leroy, N. Y.

MARSHALL, I. G., is President of the new Bourban County Oil & Gas Company, Fort Scott, Kan.

MIECZKOWSKI, THADDEUS K., of the Engineering Department of H. M. Byllesby & Company, has enlisted with the United States Army as a Russian interpreter.

MORROW, C. H., has been elected Vice-President of the newly incorporated Bourban County Oil & Gas Company, Fort Scott, Kan.

OWENS, J. F., Vice-President and General Manager of the Oklahoma Gas & Electric Company, Oklahoma City, is Director of Exhibits for Oklahoma Fairs by the U. S. Food Administration. The Administration had a large exhibit in connection with the Oklahoma State Fair recently held at Oklahoma City.

SEDBERRY, W. H., of Marshall, Tex., was elected President of the Texas Gas Association at its recent annual meeting.

SEIDENGLANZ, C. H., of Dallas, Tex., has been reelected Secretary-Treasurer of the Texas Gas Association.

ELECTED

ALABAMA—Demopolis

The Clarke County Oil & Gas Company at its annual meeting elected the following officers: P. G. Coleman of Demopolis, President; Wm. H. Welch of Demopolis, Vice-President; and C. T. McCorquodale, Secretary-Treasurer.

Directors elected were as follows: C. E. Shuptrine, Safford; W. L. Hall, Tuscaloosa; W. N. Sharp, Akron; T. H. Jones, Greensboro; C. P. Johnson, Uniontown; P. W. Crawford, Allenville; A. M. Collins, Allenville; L. S. Fox, Jr., Thomaston; Wm. H. Welch, Demopolis; P. G. Coleman, Demopolis; H. N. Beard, Demopolis; C. T. McCorquodale, Demopolis; Thos. F. Clay, Demopolis; F. Hall Granade, Demopolis.

NEW YORK—Le Roy

The Pavilion Natural Gas Company has elected the following directors: John A. Beck, G. J. Schmitt, W. P. Hansell, J. H. Friday and S. Zoch, of Pittsburgh; J. S. L. Purdy of Rochester, and H. B. Ward of Le Roy. Mr. Beck was elected president; Mr. Hansell, vice-president; J. H. Friday, treasurer and secretary, and Mr. Purdy, general manager.

INCORPORATED

INDIANA—Gary

The Skedee Oil & Gas Company has been incorporated with a capital stock of $95,000. Directors: Roy D. Davis, Peter Chase, John M. Stinson.

KANSAS—Fort Scott

The Bourbon County Oil & Gas Company has been organized by local men. The directors and officers are as follows: I. G. Marshall, M. B. Atkisson, J. R. Newman, John Glunz, J. C. Gross, J. I. Sheppard and C. H. Morrow. President, I. G. Marshall; Vice-President, C. H. Morrow; Secretary-Treasurer, J. C. Gross.

ITEMS OF FINANCE

OKLAHOMA—Bartlesville

The Empire Gas & Fuel Company, subsidiary of Cities Service Company, reports production for the year ended June 30, 1918, of 14,550,000 barrels of crude oil, an average of approximately 40,000 barrels a day for the twelve months' period.

Net earnings of Empire Gas & Fuel Company for the twelve months ended June 30, 1918, were $19,322,029.

Net earnings for the year ended December 31, 1915, were $1,861,532. In the last few months the Empire Gas & Fuel Company has greatly extended its development in the Butler County, Kan., fields, and present daily production is in excess of 60,000 barrels of crude oil, while through subsidiaries the company is producing and marketing more than 100,000,000 cubic feet of natural gas daily, supplying many important communities and essential industries with fuel for heat and power.

Oklahoma City

The Sammies Oil Corporation recently declared a dividend of 3 per cent. The company is developing territory in Texas and Louisiana.

PER CUBIC FOOT—RATES

ARKANSAS—Texarkana

The Southwestern Gas & Electric Company is asking for permission to increase its present maximum rate for domestic use from 30 cents per thousand gross to 40 cents gross. A discount of 10 per cent. will be allowed as formerly.

Decision by majorities is as much an expedient as lighting by gas.—Gladstone.

NEW YORK—Mayville

The South Shore Natural Gas & Fuel Company has increased its rate for fuel, light, and power from 40 to 55 cents per thousand. This raise was made under the terms of the franchise which provided that the rate for the first five years of the franchise period should be 40 cents per thousand, and 55 cents per thousand thereafter.

Watkins

The Consumers Natural Gas Company proposes to change its rate for natural gas in Watkins and Montour Falls and in towns of Dix, Montour and Reading, as follows:

First 5,000 cubic feet, $1.00 per thousand cubic feet; gas used in a month in excess of 5,000 cubic feet, 50 cents per thousand cubic feet; discount of 10 per cent. for payment within 10 days; service charge of 50 cents per month on consumptions of less than 500 cubic feet per month.

OKLAHOMA—Guthrie

The Oklahoma Natural Gas Company has increased its rates in this city 6½ cents per thousand.

Oklahoma City

The Oklahoma Natural Gas Company, which supplies natural gas for distribution by Byllesby companies in Oklahoma City, Muskogee, El Reno and Enid, has secured increases in rates, effective October 1.

GENERAL

INDIANA—Noblesville

A good flow of gas was struck recently while drilling for gas on the Charles Reynolds farm, north of this city, was under way. The gas comes from a depth of 38 feet.

Petersburg

The Alabama Oil Company has drilled in a large gas well on the Hoover lease, two and a half miles southwest of Union. This is the third producing gas sand found in the Union field.

Shelbyville

The Citizens Natural Gas, Oil & Water Company of Shelbyville has been authorized by the Public Service Commission to discontinue its service to patrons and take up its lines outside the city. It was denied the right, however, to engage in the manufacture of artificial gas in Shelbyville in competition with the Interstate Public Service Company.

ILLINOIS—Chicago

Thirteen employes in the office of H. M. Byllesby & Company are devoting all or a good part of their time to the Fourth Liberty Loan Drive, in various capacities. R. J. Graf, vice-president and secretary of the company, is vice-chairman of the Engineering Committee. J. H. Briggs, assistant manager of the Bond Department, is chairman of the Bureau of Information for the Chicago Committee. O. G. Corns is a member of Mr. Briggs' Committee. C. S. Packer, M. H. Sadler, W. J. Kerr, and R. A. Wortman are captains of various teams in the Trades Division. J. W. Devereaux, F. C. Gordon, M. C. Wiley, A. L. Flynn and H. V. Coffy are members of the Engineering team.

KANSAS—Butler County

One thousand eighty acres of leases have been secured by the Sinclair Oil & Gas Company on the Jolliffee farm in Section 18-23-4.

Fort Scott

The recently incorporated Bourbon County Oil & Gas Company has leased large acreage on the Redfield-Mapleton field, and according to report, will shortly start extensive development work.

Kansas City

An agreement entered into between the Southwestern Gas Company and the Kansas Natural Gas Company, it is reported, will provide an additional supply of gas for the city amounting to about 148,000,000 cubic feet. This gas has recently been developed in the Elk City pool.

KENTUCKY—Grayson County

A 500,000-foot gas well has been completed by Carl K. Dresser in his No. 1 test on the Moffett property, west of Major's lease, at a depth of 500 feet.

Louisville

The employes of the Louisville Gas & Electric Company, Louisville, Ky., contributed their services in making out all of the records in connection with the recent registration, for draft boards Nos. 4 and 5. They also assisted the employes of other concerns in handling the clerical work for draft boards Nos. 3 and 6. Mr. L. S. Mayer, auditor of the company, supervised the work. There are two other draft boards in the city, to which the Louisville Company employes have offered their services for similar work.

The Louisville Gas & Electric Company reported a gain for the week ended September 21, of 171 customers in the Gas Department. The gas output for this period was 33.2 per cent. greater than last year.

LOUISIANA—Bossier

The Southwestern Gas & Electric Company has completed a 10,000,000-foot gas well in No. 171 Bossier Land Company, Section 9-16-11, at 2,540 feet, in the Elm Grove District.

Caddo Parish

A recent completion of the Sammies Oil Corporation in the Pine Island field is reported to be making about 300 barrels. Other wells are being drilled in this field by the company.

New Orleans

The Gulf States Gas Corporation has been incorporated with a capital stock of $5,000,000. This company proposes to bring natural gas to the city by constructing a 50-mile pipe line across Terrebonne, Lafourche, St. Charles, Jefferson into St. Bernard Parish, where a crossing of the Mississippi is hoped to be affected.

Franchises have been granted by the parishes of Terrebonne, St. Charles, Jefferson and St. Bernard, it is announced, but as yet no franchise has been asked or sought in New Orleans.

I judge people by what they might be,—not are, nor will be.—Browning.

Shreveport

According to report, the Red Banks Oil Company has a 15,000,000 cubic foot well in its No. 2 on the Herold property, Section 35-21-15, at a depth of 2,215 feet.

St. Louis

The Empire Gas & Fuel Company of Baulesville, Okla., has opened a branch purchasing office in this city. It has been found that branch offices in the various large centers facilitate the securing of material.

KENTUCKY—Covington

The H. M. and C. Oil & Gas Company has about 2,000,000 feet of gas on the Brewer, Couch and Kneeland land, in the S. W. quarter, 11-21-4, adjoining the town on the west, at 1,647 feet.

NEW YORK—Batavia

After thorough inquiry into the proposition to bring by-product gas to Batavia, it has been found that plan is not feasible on account of the nineteen and a half miles of pipe required, and which it is impossible to secure at this time.

Batavia

It is reported that the Alden-Batavia Natural Gas Company will not drill any more wells this year in the Pavilion field, but is engaged in cleaning out the well on the Murphy farm in Pavilion to insure a larger flow of gas. The company is preparing to move the compressor and gas engine from the Pavilion field to Crittenden, and there will use it in pumping artificial gas from Tonawanda.

Kenmore

It is reported that after cleaning out an old well on his property, Dr. G. D. Smith secured adequate gas production for all domestic purposes. The property is located within the limits of the village of Kenmore.

OKLAHOMA—Bixby

Davis & ounger have a good gasser in their second completion on the Harry land, in Section 28-16-13. It is estimated at 8,000,000 cubic feet.

El Reno

The local W. S. S. bank is being equipped for heating with natural gas, the labor in making the installation being donated by the El Reno division of the Oklahoma Gas & Electric Company.

Jennings

The Sinclair Oil & Gas Company and others have a 2,000,000 gasser in their third completion on the Mullendore land, southeast quarter of Section 1-20-7.

Lawton

Keys, Young & Shaw have a good production of gas at a depth of 1,200 feet in their test in Section 17-1-10.

It is said that preparations are being made to lay gas mains to Fort Sill. The firm also has plans under way for installing the first gasoline plant in this field.

Okmulgee County

The Iowa Oil Company has a 35,000,000-foot gas well in its test on the Lefford farm, in Section 17-13-12, Tiger Flats District, from sand at 2,069 to 2,117 feet.

The Iowa Oil Company has a 35,000,000-foot gas well in its test on the Lefford farm in Section 17-13-12, Tiger Flats District, from sand at 2,069 to 2,117 feet.

Osage County

The Owen & Osage Oil Company's No. 4 in the northwest quarter of Section 4-27-10, is a 5,000,000-foot gas well in sand at 1,240-72 feet.

Payne County

In the Yale Pool, the Magnolia Petroleum Company got a 3,000,000-foot gas well in its No. 5 on the Jones farm, 7-19-6, in sand at 2,845-54 feet.

Pawnee County

The Paragon Oil Company's No. 33 on the McNae farm, in Section 3-16-7, is doing 3,000,000 feet of gas from sand at 2,673 to 2,735 feet.

Red Fork

The Cosden Oil & Gas Company's No. 2 Hardridge, in the center of the south line of the south half of the southwest of the northwest quarter of Section 20-19-11, is an 8,000,000-foot gas well in sand at 1,789-93 feet.

The Texas Company's No. 1 Payne in the northeast corner of the northeast of the southeast of the southeast quarter of Section 30-19-11 is a 4,000,000-foot gasser in sand at 1,792 to 1,801 feet.

Campbell & Parker report 6,000,000 cubic feet in their completion on the Thomas farm, in Section 20-19-11.

Stephens County

In the Comanche District, the Comanche Oil Company's test in Section 20-2s-7w, is good for 5,000,000 feet of gas in sand at 1,282-90 feet and has been shut down.

The Texas Company's No. 1 J. M. Parks is making 20,000,000 feet of gas from the top of a sand at 2,110 feet. Drilling will be continued.

Wagoner County

In the Coweta District, the Edgar Oil Compony's No. 6 Manuel, in Section 31-17-15, is a 3,000,000-foot gasser.

PENNSYLVANIA—Richburg

John Richeson of Bradford, Pa., has purchased the gasoline plants at Richburg and in Bolivar Township owned by Dennis V. McCarthy.

The two plants use about 300,000 feet of gas a day. The sale includes all equipment used in manufacturing casinghead gasoline. The consideration was private. Frank Sheehan of Oklahoma, will move to Bolivar to superintend the plants.

TEXAS—Amarillo

It is reported that the Hapgood well, north of town, was brought in with a heavy flow of gas.

Ranger

The Sammies Oil Corporation has secured leases on about 1,800 acres in this field, in addition to the land already leased.

A distributing system is being constructed by the company in this city, and will shortly be in a position to furnish gas.

WEST VIRGINIA—Doddridge County

On the left fork of Arnold's Creek, Central District, the Columbia Carbon Company completed No. 20 on the Lewis Maxwell farm. A light gas pressure was developed in the Gordon sand.

Roane County

A casinghead gasoline plant of the absorption type, it is said, will be built in this field by the Interstate Gasoline & Oil Company of Pittsburgh. H. A. Fisher Company, gasoline engineers, have the contract for the construction of the plant.

INDEX OF PAST 1918 ISSUES—Continued

MEMBERS OF ASSOCIATION OF NATURAL GAS SUPPLY MEN

DAVID O. HOLBROOK, President, Oliver Building, Pittsburgh.

LARMOUR ADAMS, Secretary, 1304 First National Bank Building, Pittsburgh.

Ajax Iron Works, Corry, Pa.
Allegheny Steel Co., Pittsburgh.
Anchor Packing Co., Pittsburgh.

Bessemer Gas Engine Co., Grove City.
Blodgett Co., Inc., The G. S. Burlington, Vt.
Borden Company, Warren, Ohio.
Bovaird & Seyfang Mfg. Co., Bradford, Pa.
Bristol Co., The, Waterbury, Conn.
Broderick & Bascom Rope Co., St. Louis.
Bryant Heater & Mfg. Co., Cleveland.
Buffalo Co-operative Stove Co., Buffalo.
Builders Iron Fdy., Providence.
Byers, A. M. Co., Pittsburgh.

Carnegie Steel Co., Pittsburgh.
Chaplin-Fulton Mfg. Co., Pittsburgh.
Cincinnati Rubber Mfg. Co., Cincinnati.
Clark & Norton Mfg. Co., Wellsville, N. Y.
Cleveland Gas Meter Co., Cleveland.
Colona Mfg. Co., Pittsburgh.
Columbia Gas Stove Co., Huntington, W.Va.
Columbian Rope Co., Auburn, N. Y.
Columbus H't'g & Vent'g Co., Columbus.
Continental Supply Co., St. Louis.
Cooper, C. & G Co., Mt. Vernon, O.
Crandall-Pettee Co., New York City.
Cutler Hammer Mfg. Co., The Milwaukee.

Davis-Bournonville Co., Jersey City.
Dayton Pipe Coupling Co., Dayton.
Davison, N. C., Gas Burner & Weld'g Co., Pittsburgh.
Domestic Engineering Co., Dayton, O.
Draeger Oxygen Apparatus Co., Pittsburgh.
Dresser, S. R., Mfg. Co., Bradford, Pa.

Equitable Meter Co., Pittsburgh.
Estate Stove Co., Hamilton, O.

Fitler, Edwin H. Co., Philadelphia, Pa.
Foxboro Co. The, Foxboro, Mass.
Franklin Co. The, Canton, O.
Frick & Lindsay Co., Pittsburgh.
Fuel Oil Journal, Houston, Texas.

Garlock Packing Co., Palmyra, N. Y.
Gas Age, The, New York City.
Gas Appliance Co., Cleveland.
Gas Record, Chicago.
General Fire Ext'g'r Co., Providence.
General Gas Light Co., Kalamazoo.
Germer Stove Co., Erie.
Gilfillan Machine Works, Ebenezer, N. Y.
Goodrich, B. F. Co., Akron, O.
Graves Supply Co., Cincinnati.
Guardian Gas Appliance Co., The, Cleveland, Ohio.
Gwynn Gas Burner & Eng. Co., Pittsburgh.

Hammon Coupler Co., Pittsburgh.
Haymond Co., Muncie, Ind.
Hays Mfg. Co., Erie.
Hart Mfg. Co., Cleveland.
Hazard Mfg. Co., Chicago.
Heeter, C. M. Sons & Co., Inc., Butler, Pa.
Hewitt Rubber Co., Pittsburgh.
Hooven, Owens, Rentschler Co. Hamilton O.
Hope Engineering & Supply Co. Pittsburgh.

Ideal Heating Co., The, Columbus.
Imperial Belting Co., Chicago, Ill.
Ingersoll-Rand Co., Pittsburgh.
International Hale Gas Mixer Company, Providence.
Iroquois Natural Gas Co., Buffalo, N. Y.

Jarecki Mfg. Co., Erie.
Jiffy Water Heater Co., St. Louis.
Jones & Laughlin Steel Co., Pittsburg, Pa.

LaBelle Iron Works, Steubenville, O.
Lattimer-Stevens Co., Columbus, Ohio.
Leschen, A. & Sons Rope Co., St. Louis.
Lezius Automatic Draft Reg. Co., Cleveland.
Lucey Mfg. Corp., Pittsburgh.
Ludlow Valve Mfg. Co., Pittsburgh.

Macomber & Whyte Rope Co., Chicago.
Manhattan Rubber Mfg. Co., Passaic, N. J.
Mark Mfg. Co., Chicago.
Maxon Premix Burner Co., Muncie, Ind.
Meek Oven Mfg. Co., Newburyport, Mass.
Metric Metal Works, Erie.
Minneapolis Heat Reg. Co., Minneapolis.
Modern Iron Wks., Quincy, Ill.
Modern Safety Iron Co., Philadelphia.
Moon Mfg. Co., The, Chicago.
Moore, Lee C. & Co., Inc., Pittsburgh.
Moser Mfg. Co., Kane, Pa.
Mueller H. Mfg. Co., Decatur, Ill.

Nathan Mfg. Co., New York City.
National Supply Co., Pittsburgh.
National Transit Pump & Mach. Co., Oil City, Pa.
National Tube Co., Pittsburgh.
Natural Gas & Gasoline Journal, Buffalo.
New Bedford Cordage Co., New York City.
New York Belt'g & Pack'g Co., New York.
Nye, A. T. & Son Co., Marietta, O.

Oil & Gas Journal, Tulsa, Okla.
Oil City Boiler Wks., Oil City, Pa.
Oil Trade Journal, New York.
Oil Well Supply Co., Pittsburgh.
Oxweld Acetylene Co., Chicago.

Parkersburg Mach. Co., Parkersburg, W.Va.
Parkersburg Rig & Reel Co., Parkersburg, W. Va.
Peerless Heater Co., Pittsburgh.
Pennsylvania Furnace & Stove Co., Warren, Pa.
Pittsburg Meter Co., East Pittsburg.
Pittsburg Reinforced Brazing & Mach. Co., Pittsburgh.
Pittsburg Valve & Fittings Co., Pittsburgh.
Pittsburg Valve, F'd'y & Const. Co., Pittsburgh.
Pittsburgh Water Htr. Co., Pittsburgh.
Plymouth Cordage Co., N. Plymouth, Mass.
Pratt & Cady Co., Inc., New York City.
Prichard Supply Co., Mannington, W. Va.

Rathbun-Jones Eng. Co., Toledo.
Reid, Jos. Gas Engine Co., Oil City, Pa.
Reliable Stove Co., Cleveland.
Republic Iron & Steel Co., Youngstown, O.
Revere Rubber Co., Chelsea, Mass.
Reznor Mfg. Co., Ltd., Mercer, Pa.
Riesenman Mfg. Co., Ltd., Franklin, Pa.
Robinson, J. E. & Co., Oil City, Pa.
Robinson Packer & Mach. Co., Coffeyville, Kansas.
Roebling, John A. Sons Co., Trenton, N. J.
Rossendale-Reddaway Belt'g & Hose Co., Newark, N. J.
Ruud Mfg. Co., Pittsburgh.

Sanitary Co. of America, Linfield, Pa.
Schaeffer & Budenberg Mfg. Co., Pittsburgh.
Scientific Heater Co., The, Cleveland, Ohio.
Selas Co., Canton, O.
Solar Light Co., New York City.
South Chester Tube, Chester, Pa.
Spang, Chalfant & Co., Pittsburgh.
Sprague Meter Co., Bridgeport, Conn.
Strause Gas Iron Co., Philadelphia.
Superior Gas Engine Co., Springfield, O.

Tate-Jones & Co., Inc., Pittsburgh.
Taylor, W. P. Co., Buffalo.
Toledo Pipe Thr'd'g Mach. Co., Toledo, O.
Troop Mfg. Co., Pittsburgh.

United Seal Co., Columbus.
Utica Valve & Fixture Co., Utica, N. Y.

Welsbach Co., Gloucester City, N. J.
Westinghouse Mach. Co., Pittsburgh.
Westinghouse Electric & Mfg. Co., Pittsburgh.
Wheeling Steel & Iron Co., Wheeling.
Wolfe, Linden W., Oil City, Pa.
Worthington Pump & Mach. Corp., Buffalo.
Wright Wire Co., Worcester, Mass.

Youngstown Sheet & Tube Co., Youngstown, O.

WORLD PEACE MEANS WORLD PROSPERITY.

Great as is our enthusiasm, expressed by millions of people in every conceivable manner because of the cessation of hostile activities and the agreeing by Germany to conditions so specific as to leave no question regarding absolute surrender and the guarantee of a world's peace and of world-wide prosperity, we can under the conditions, even those of us who have had boys on the casuality list, well afford to be magnanimous, rather than vindictive, and in every manner possible assist those who, though German by birth, are democratic in spirit, and who having seen the error of selfish power, selfishly administered, are today seeking to make Germany a free nation and the home of a free people.

While forcing those who are rebelling to submit, let us do so in the spirit of assisting those of the same nationality who are throwing off the chains of oppression and slavedom to accomplish the great aim for which the United States has stood in this most fearful warfare.

As we are binding for mailing the November number of this magazine, we are privileged close following the eleventh hour of the eleventh day of the eleventh month of 1918 to recount the surrender of imperialism to democracy. The sunrise of world-wide humanity, and world-wide prosperity.

In this our own particular gas field we foresee the birth of a greater industry and of a prosperity that has not heretofore been known, because of our now broader vision and knowledge of how gas may be used as a substitute for coal. Thus becoming an economizer in many ways, the outcome of which shall be a greater conservation of nature's resources, and an increased recovery of the by-products that science has taught us through our gas-making processes may be recovered from nature's coal deposits.

Let us rejoice not only at the defeat of that which our enemies stood for, likewise the stopping of war-onslaughts, which means the saving of our man-power, and our resources, but over the fact that the natural gas industry of the United States will be called to supply its products for peace and not for war.

President Wilson desires that the men in cantonments shall be returned to their homes immediately. This should mean speedy cutting off of the consumption of millions of tons of coal, which in turn must mean, along with the releasing of coal in other directions, an ability on the part of the gas industry to soon pursue its activities most vigorously.

As gas is supplied in greater volume for peace purposes, gas-appliances will be required in greater number, and in view of a vastly curtailed output in ship-production and war materials requiring iron, copper, etc., let every gas manager and every manager of a gas appliance or equipment manufacturing concern, *take off his coat and go to work to rebuild not only this industry as a whole, but his individual business along the lines of manufacturers for peace,* as he has been active in manufacturing or assisting, for war.

This is the time for the business men of America to display their ability to take advantage of a great opportunity. Let us make this the day of the birth of a greater natural gas industry in the United States.

Lucius S. Bigelow

RELEASING RESTRICTIONS

THE following from Washington dated November 12th, has been issued as a notification to manufacturing interests and producers, as indicated in the Washington advices:

> Washington, D. C., Nov. 12.—As the first step in national industrial readjustment from a war to a peace basis the War Industries Board today announced modifications in the restrictions against non-war construction and manufacturing.
>
> All industries whose peace time output has been curtailed in the interest of the nation's war program may now increase their output [illegible] per cent of the amount of restriction imposed by the board. [illegible] restrictions are removed against the building of farm or ranch buildings, structures, roadways or plant facilities for railroads, [illegible] waterways and other public utilities [illegible] maintenance [illegible] improvement or development by federal, state or municipal [illegible] of highways, [illegible] bridges, streets, parks, playgrounds and public [illegible] and [illegible]
>
> [illegible]

We [illegible] the [illegible] have [illegible] either [illegible] [illegible]

[illegible]

[illegible] rebuilding [illegible] general [illegible] the rebuilding [illegible] individual sales [illegible]

Now that peace [illegible] active campaign. Every manufacturer [illegible] of the field and some have already begun [illegible] purposing not to be a day behind in their activities.

Each manufacturer of gas appliances [illegible] gas equipment [illegible] supplies should immediately advertise and canvass the field [illegible] of the field as outlets for his normal peace products.

A NEW TYPE OF OIL LINE PUMP.

OUT of the necessities of war have developed many improvements in machines and methods which are adaptable in the industries of times of peace. There seems little relation between the hydraulic forging of shells and the pumping of oil, yet from the requirements of one have led developments proving greatly advantageous to the other. Before the war, pumps furnishing supply to hydraulic presses were usually built with cast iron or bronze water ends, except for very high pressures. For pressures of 5,000 pounds, per square inch and above, cylinders were hammered out of forged steel and were limited to very small sizes. The last three years have seen a wonderful development in this work. Sizes have increased and designs have been simplified. The forged cylinder has come into use for all pressures above 1,000 pounds per square inch. The Worthington Pump and Machinery Corporation engineers were the first to recognize the possibilities of this construction for oil line work where the pressures run from 700 to 1,000 pounds. Their first suggestion of its use for this service was not well received by the operators for it involved a radical change from the pot valve casting construction with which they were thoroughly familiar. However, after considerable effort, some sacrifice in price, and making of rigid guarantees, a number of trial installations were secured. The success of these trial pumps has conclusively demonstrated their value and this form of construction is now used on pumps from 4 x 12 duplex, 4,000 barrels per day, up to 6½ x 24 duplex, 20,000 barrels per day, and can be furnished for larger capacities if desired.

Broken cylinders and valve pots are entirely eliminated for the single steel forged billet in which cylinder and valve chambers are incorporated has such an excessive strength that breakage under pressure is impossible. The use of gaskets on the pressure joints is not required for the joints are of small size and special form which permits making them absolutely tight metal to metal. Heavy valve pot covers do not have to be lifted to get at the valves. Each valve has its individual cover in the form of a screwed plug easily handled. There are no studs to break off in making up pressure joints when handled by rough, inexperienced labor. Every part of the pump is readily accessible to a man standing on the floor. It is built low down, close to the foundation, and is rigidly supported by the same.

Valves are solid bronze balls, or bronze wing guided type, with or without leather face, according to requirements of service. While all of the valves are accessible from the top of the cylinders the suction valves are located below the plungers and the discharge valves above plungers. This allows a reasonably direct flow through the pump without the abrupt reversal of direction such as occurs in the pot valve type of construction. The location of valves permits of a minimum size pulsation chamber, thus reducing the clearance. This is a highly important feature in handling volatile fluids. A further advantage due to location of valves is a reduction of several feet in the suction lift, thus allowing supply tanks to be drawn down lower.

The excellent vacuum which this pump can maintain permits its use as a suction pump for drawing oil out of the pipe lines in case of necessity.

While the essentially new feature is the forged steel oil end construction, yet the power end is also worthy of attention, for it is designed with a view to meeting the hardest continuous service. Heavy frames supported throughout their whole length directly on the foundation give great strength and rigidity. All bearings and pins are of very liberal size and are provided with readily taken up adjustments. Gearing of either the spur or herringbone type is made of suitable ratio for direct connection to oil engine.

There are a considerable number of these pumps in service in the mid-continent field, regarding the performance of which splendid reports are received.

NOW OIL STAR.

A FORMER baseball star pitcher on the staff of Manager McGraw of the New York Giants, W. B. Perritt (known as "Poll"), is now not only a stockholder, but a director in the Bird Bros. Oil Company, an independent concern operating in the north Louisiana field. The company is made up of various prominent operators who are the capitalists of the institution, but "Poll", no doubt, as a director will put some of his best curves into the company's activities. The Bird Bros. Oil Company has large acreage under lease in the Pine Island field.

MIXING GASES.

IT was the purpose of the gas interests serving the territory in New York State just east of Buffalo with gas from the Pavilion region, to this year mix with it by-product gas from Tonawanda, N. Y., serving the communities with the mixture at what was claimed should be a reasonable figure. Batavia, however, seems to have kicked over the traces. The city fathers agreed to a new franchise which should give the combined interests representing the gas companies the right to serve the community under the proposed franchise. Later, however, this grant was recinded by Batavia, it being explained that the former franchise specifically named a rate at which gas must be supplied to the community, while it was pointed out that the new franchise left it open for the gas company to make such charge at a future time as it might please. The matter is now before the Public Service Commission.

Aspiration sees only one side of every question; possession many.—Lowell.

Deep Well Drilling

"The Deepest Well in the World, and the Next Deepest in America" — Paper Presented Before the Natural Gas Men at Recent Pittsburgh Convention Gives Very Interesting Accounts of Deep Drilling in This Country.

BY DR. ISRAEL C. WHITE.

PREVIOUS PUBLICATION.

AT the annual meeting of the Geological Society of America, December 30th, 1912, the writer presented a "Note on a Very Deep Well near McDonald, Pennsylvania," and the same was published in Volume XXIV, pages 275 to 282, under date of June 10th, 1913. At that time the well in question, which is located on the R. A. Geary farm, about five miles northwest from McDonald, Pennsylvania, near the line between Allegheny and Washington counties, had attained a depth of 6,299 feet, and was still drilling. As related in the former "Note," the boring was executed by the Peoples Natural Gas Company, of Pittsburgh, Pennsylvania, an organization which, together with the Hope Natural gas Company, a co-worker in deep drilling, is subsidiary to the Standard Oil Company, of New Jersey. Mr. John G. Pew of Pittsburgh, is President of the Peoples Natural Gas Company and Capt. L. F. Barger of the same city was General Manager and in immediate charge of field operations during the period in which the Geary well was drilled, and to their courtesy and liberal views in their attitude toward geologic science, we are indebted for the record of this very deep boring.

As stated in the previous publication, this well is located on the Candor Dome described in the Burgettstown Folio of the U. S. Geological Survey, by E. W. Shaw and M. J. Munn, a structural feature in the rocks of the region where the several sands of the lower Pennsylvanian, Mississippian, and upper Devonian beds had produced large quantities of natural gas, but in the course of twenty odd years of production had become practically exhausted on account of the great decline in rock pressures through continued use of the gas. It was in hopes of developing still deeper and virgin horizons of natural gas that the drilling of the Geary well was undertaken on the summit of the Candor dome where several successive gas sands had already furnished large quantities of this matchless fuel.

After overcoming many difficulties, including the loss of a bailer and many hundred feet of steel line in the hole, pulling casing and reaming, to shut off additional water found at 6,520 feet, as also the loss of two strings of drilling tools, only one of which could be recovered from a depth of nearly 7,000 feet, the lower string of tools was left at the side of the hole which was drilled past them and the tools cased off with 7,214 feet of 4½ inch casing welded into one continuous tube by the oxy-acetylene flame, and constituting probably the longest string of casing ever set in any boring anywhere in the world. After the salt water struck at 6,520 to 6,530 feet had been successfully shut off at 7,214 feet and the missing set of tools safely sidetracked into the wall of the well, the lower joints of this very long casing tube under a water pressure of nearly 3,000 pounds to the square inch collapsed around the drilling tools, and as there was, of course, a curve in the bore hole opposite the lost tools, the drilling set could not be withdrawn, and thus the second deepest hole ever yet sunk in the new world (and exceeded only by the Czuchow well—7,349 feet—in the old world) was plugged beyond hope of recovery at a depth of 7,248 feet, in the summer of 1917, after more than six years of continuous work, and the expenditure of very many thousands of dollars in an effort to reach the "Clinton" oil and gas zone of Ohio which has proved gas-bearing and petroliferous practically from the Ohio River in Scioto County northward to Lake Erie in Cuyahoga County. This gas horizon was termed "Clinton" by Dr. Edward Orton, Sr., when it was first discovered and it will probably continue to retain the original name, but the writer has always regarded it as more probably the equivalent of the White Medina Sandstone horizon immediately below the true Clinton of the New York series, and in this conclusion Prof. J. A. Bownecker, the present State Geologist of Ohio, concurs.

The record of this second deepest well in America and third deepest in the world affords so much of geologic and stratigraphic interest that it is here given in full with the kind permission of Messrs. Pew and Barger. It reads as follows:

R. A. GEARY WELL RECORD, NO. 1770 OF THE PEOPLES NATURAL GAS COMPANY.

Located five miles northwest from McDonald, Pennsylvania; beginning 130 feet below the crop of the Pittsburgh Coal; well mouth approximately 1,053 feet above tide.

	Thickness Feet	Total Feet
Conductor	16	16
Unrecorded (13" casing set at 232')	434	450
Lime	20	470
Slate	125	595
Middle Kittaning Coal (water at 600')	5	600
Unrecorded	134	734
Salt Sand (gas at 760' and 912')	216	950

—1918 Convention of Natural Gas Association of America.

We promise according to our hopes, and fulfill according to our fears.—La Rochefoucauld.

Pencil Cave (10" casing set at 953')		3	953
Big Lime		29	982
Big Injun Sand (gas at 1,052')		258	1,241
Unrecorded		137	1,378
Squaw Sand (gas at 1,379')		14	1,392
Unrecorded		218	1 610
Sand (Berea)		12	1,622
Unrecorded		172	1,794
Hundred-Foot Sand (gas at 1,797')		23	1,817
Unrecorded		93	1,910
Thirty-Foot Sand (gas at 1 912')		15	1.925
Unrecorded		43	1,968
Gordon Stray Sand (8¼" casing set at 1,969')		3	1.971
White slate		1,019	2,990
Lime		220	3 210
White slate		230	3,440
Lime		10	3,450
White slate		650	4,100
Sand and lime (Benson, Bradford?)		70	4.170
White slate		350	4,520
Black slate		30	4 550
White slate		650	5,200
Black slate		120	5,320
Black shale		200	5.520
White slate		140	5,660
Limestone 20' / Black lime 108	Selinsgrove	128	5.788
Black slate (Marcellus)		200	6,008
Black lime 15' / Flint 22	Corniferous	37	6,045
Gray sand (6⅝" casing, 6,053') (water and gas 6,045') 155' / Brown sand 60 / White sand (water, 6260-6265) 10 / Brown sand 45	Oriskany	270	6 315
Black lime 80' / Sand and black flint 10 / Black lime 110 (200') / White sand, Stormville Conglomerate (Coeymanus) (gas 6,522', water, 6,520 to 6,530 feet) 15 / Black limestone 80' / Gray limestone (Bossardville) 90 (170)	Helderberg	385	6,700
Rock salt 8 / Lime and sand 67 / Rock salt 10 / Limestone 45 / Rock salt 40 / Lime and sand 20 / Rock salt 5 / Limestone 5 / Rock salt 5 / Limestone 20 / Rock salt 5 / Limestone (tools lost) 15 / Limestone and sand 95 / Salt and lime shells 15	Salina Salt Series	340	7,040
Sand and lime, Salina and Niagara, to bottom		208	7,248

CASING RECORD.

16" hole to 232'; cased to that point with 13" casing:
13" hole to 953'; to that point 10" casing;
10" hole to 1 969'; 8¼" casing to that point;
8¼" hole to 6,053'; 6⅝" casing to that point, weight, 68 tons.
6⅝" hole to 6,315'; 4½" casing to that point, weight 46 tons.
Then pulled 4½" casing and reamed and drilled hole to 7,214', when 7,214 feet of 4½" welded casing was set.

This detailed record may be summarized as follows, beginning at the base of the Pittsburgh Coal 130 feet above the derrick floor:

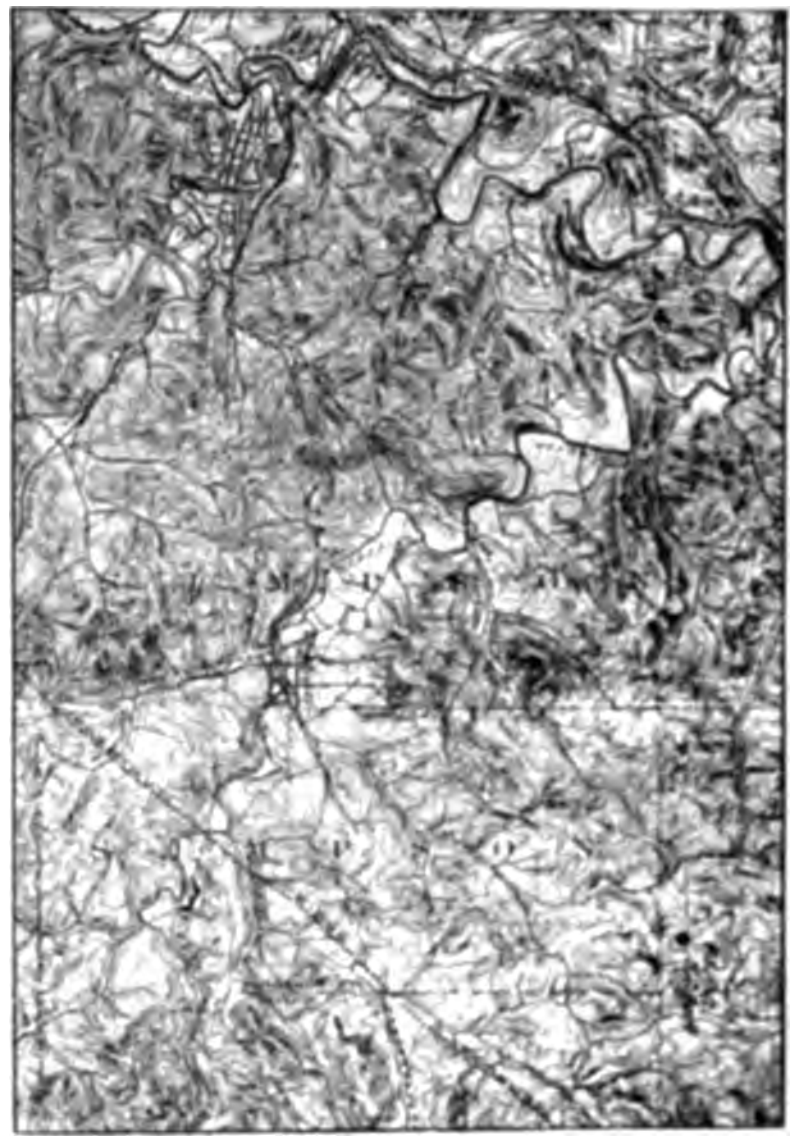
		Thickness Feet	Total Feet
Conemaugh Series .. 580' / Allegheny Series .... 284 / Pottsville Series 216	Pennsylvanian .	1.080	1.080
Mauch Chunk ..... 3' / Big Lime ("Mountain, Greenbrier") ..... 29 / "Big Injun," "Squaw" and "Berea" Sands. 640	Mississippian ..	672	1 752
Catskill (including Venango Oil Sand Group), Chemung Portage, Hamilton, and Marcellus beds		4.386	6,138
Corniferous Limestone		37	6.175
Oriskany Sandstone		270	6,445
Helderberg		385	6,830
Salina Salt Series		340	7.170
Salina Shales and Niagara (Clinton?)		208	7,378

It is regrettable that this boring could not have been sunk a few hundred feet deeper, since the horizon of the "Clinton" oil and gas zone could not have been more than 100 to 300 feet below where the tools were so successfully imprisoned, and reluctantly abandoned by Mr. Pew and his associates.

The demonstration of the existence of commercial deposits of rock salt in the Salina Series extending in unbroken sheets from Cleveland past Akron (where its presence had already been demonstrated) to the vicinity of Pittsburgh and probably many miles southward, is an accomplishment well worth all of the cost of the boring, to say nothing of the great addition to the sum of stratigraphic and geologic knowledge otherwise forever to remain a sealed book except for the labor and money expended thereon by the men of broad vision and ample means who had at their command the unlimited resources of the Standard Oil Company of New Jersey. To Mr. A. C. Bedford, Chairman, and the other officers of this great corporation, geologic science is indebted for this rich contribution to the sum of human knowledge. It is barely possible that in addition to the vast quantity of common salt, or sodium chloride, in these great underground deposits, some of the potash salts, potassium chloride and potassium sulphate, may also exist and will be found interbedded among these other saline products.

Opportunity was afforded the experts of the U. S. Geological Survey to test this deep well for temperature observations and the Peoples Natural Gas Company also made some temperature tests on its own account, these latter being given in the Geological Society of America publication referred to above.

The true, strong, and sound mind is the mind that can embrace equally great things and small.—Johnson.



To believe with certainty we must begin with doubting Stanislaus

1,325.9	4,350	41.7	107.1
1,402.1	4,600	43.6	110.5
1,478.3	4 850	45.1	113.2
1,554.4	5,100	49.5	121.1
1,592.6	5,225	51.8	125.2
1 630.7	5,350	53.2	126.8
1,706.9	5,600	56.3	133.3
1,783.1	5,850	58.9	138.0
1,828.8	6,000	60.0	140.0
1,859.3	6,100	60.7	141.3
1,935.5	6,350	59.3	138.7
2,011.7	6,600	62.3	144.1
2,065.0	6,775	63.2	145.8
2,126.0	6,975	62.7	144.9

Mr. Van Orstrand, with improved temperature reading and recording devices, was to have been given an opportunity to make other temperature tests before the boring was abandoned, but the unhappy accident mentioned above prevented this very desirable accomplishment.

The water found at 6,260 feet was analyzed, the results of which are recorded in the former publication by the writer.

Deepest Well in the World, Martha O. Goff, No. 4190, of the Hope Natural Gas Company, 8 miles northeast of Clarksburg, Harrison County, W. Va., and the men who drilled it; namely, (from left to right): James B. Wells, Tool Dresser; Charles Welch Foreman; F. C. Davis, Tool Dresser; A. L. Rawlins, Driller; E. C. Brummage, Driller, and John H. Williams, Superintendent.

The apparent decrease in temperature in descending, like that from 6,100 feet to 6,350 feet, is due to the cooling effect of natural gas flows struck between such horizons, the expansion of the gas taking up heat.

THE DEEPEST WELL IN THE WORLD.

The deepest well in the world is the one put down by the Hope Natural Gas Company on the Martha O. Goff farm, about 8 miles northeast from Clarksburg, Harrison County, West Virginia. Through the courtesy of Messrs. John B. Corrin and John G. Pew, Vice-Presidents of the Hope Company, and John H. Williams, Superintendent of the Drilling Department, the record of this deepest of all borings, together with a sketch map showing its location, photos of the derrick, cable, drilling crew, etc., are given herewith. The well was begun with the idea of testing for deeper oil or gas horizons than any hitherto encountered in West Virginia, the intention being to drive it to the horizon of the "Clinton" (Medina) petroliferous Sand of Ohio, if possible. The Devonian Shales, however, having thickened over a thousand feet more than expected, this boring will most probably be stopped after penetrating and testing the Oriskany Sandstone, now only a few feet (probably not more than 20 to 30) below the present bottom (7,386') of the well where it is temporarily delayed with a fishing job, the steel cable having parted over 5,000 feet down, thus leaving the tools and 2,000 feet of cable in the hole. Mr. John H. Williams (to whose great skill and accomplishments in the art of drilling, aided by the splendid work of his resourceful crew, geology is indebted for the deepest well ever drilled) thinks that he can soon clear the well of the broken cable and tools, and then sink the same several hundred feet deeper, even to 8,000 feet or more, the only trouble being to find a cable of the right strength and quality, some of them having parted with only a few hours' use. The complete history of this remarkable well is given in the following summary and record prepared by John B. Corrin and John H. Williams:

STATISTICS CONCERNING DEEP WELL DRILLED BY HOPE NATURAL GAS COMPANY.

LOCATION:

On the Martha O. Goff farm of 620 acres in Simpson District, Harrison County, West Virginia, on the waters of Owens Fork of Booths Creek, 4½ miles northeast of the town of Bridgeport, on the main highway from Fairmont to Clarksburg, W. Va. Well accurately located on the accompanying topographic sheet.

ELEVATION:

Location made for well March 3rd, 1916, at a point 1,164 feet above sea-level, and 200 feet below the level of the Pittsburgh seam of coal.

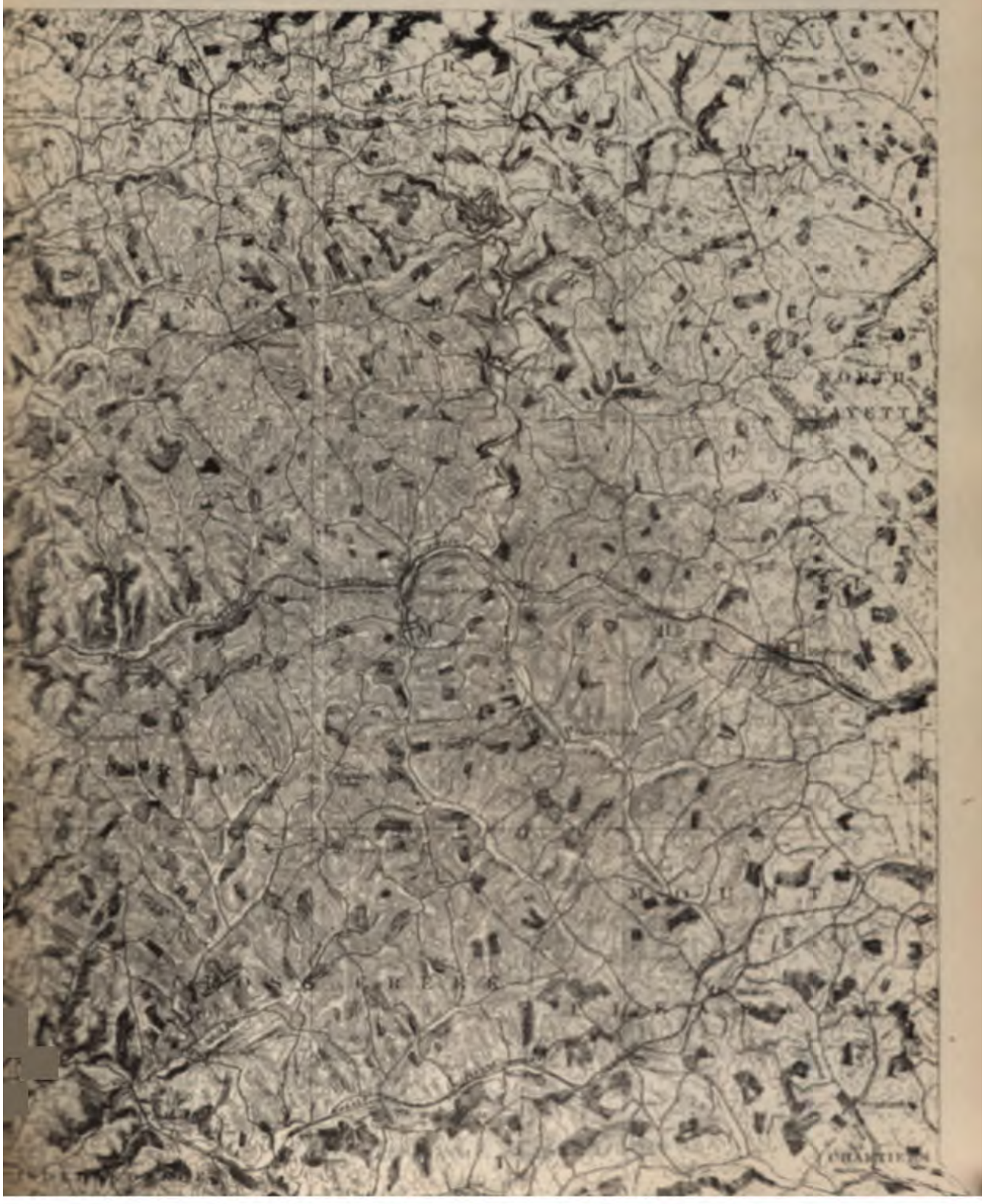
SUMMARY OF DRILLING:

Drilling was commenced April 19, 1916, and on March 4, 1918, a depth of 7,386 feet had been reached, thus exceeding by 37 feet the depth of the well hitherto known as "the deepest well in the world," located at Czuhow in Germany. Approximately 400 days have been spent in actual drilling, the remainder of the time the well has been shut down for repairs to rig, boilers, cables, etc., waiting for materials, minor fishing jobs, taking of temperatures cleaning out cavings from the hole, etc. Fortunately, no serious fishing jobs have been encountered. The last known sand passed in the well was the Bayard Sand, at depth of 2,300 to 2,310 feet. Following is record of the various formations, and the dates showing progress of the work:

RECORD:

	Top Feet	Bottom Feet
Native Coal (Elk Lick)..	83	86
Little Dunkard Sand ...	170	186
Big Dunkard Sand	305	336
Gas Sand	436	446
First Salt Sand	690	815
Second Salt Sand	860	880
Maxton Sand 1,025		1,040
Little Lime 1,183		1,194
Pencil Cave 1,194		1,210

He who lacks strength must attain his purpose by skill.—Scott.



Big Lime	1,210	1,275	Gas at 1,253 ft.
Big Injun Sand	1,275	1,394	Water at 1,304 ft.
Squaw Sand	1,410	1,428	
Berea Sand	1,512	1,540	
Gantz Sand sonsolidated with Fifty-foot			
Fifty-foot Sand	1,748	1,885	Gas at 1,749 ft. and
Thirty-foot Sand	1,900	1,980	1,757 ft.
Gordon Stray Sand	2,090	2,097	
Gordon Sand	2,130	2,142	
Fourth Sand		None	
Fifth Sand		None	
Bayard Sand	2,300	2,310	June 23, 1916.
Slate Shells	2,310	2,830	
Hard lime	2,830	2,893	
Slate and Lime shells	2,892	3,125	
Hard lime	3,125	3,145	
Slate shells	3,145	3,222	
Hard lime	3,222	3,240	
Slate shells	3,240	3,480	
Hard sand	3,480	3,505	
Slate	3,505	4,166	
Lime shells (Benson Sand)	4,166	4,167	With puff of air
Slate	4,167	4,425	(gas).
Lime	4,425	4,500	Sept. 8, 1916.
Slate and shells	4,500	4,790	
Lime	4,790	4,850	
Slate shells	4,850	5,200	
Slate shells at		5,700	December 23, 1916.
Slate shells at		5,775	January 6, 1917.
Dark slate	5,840	5,995	
Lime shells	5,995	5,998	
Dark slate	5,998	6,210	
Light slate	6,210	6,235	February 16, 1917.
Lime	6,235	6,265	
Dark slate	6,265	6,272	
Lime	6,272	6,280	
Dark slate	6,280	6,294	
Lime	6,294	6,304	
Dark slate	6,304	6,318	
Lime	6,318	6,330	March 23, 1917.
Dark slate	6,330	6,360	
Lime	6,360	6,380	
Dark slate	6,380	6,385	
Lime	6,385	6,395	
Dark slate	6,395	6,420	
Lime	6,420	6,426	
Dark slate	6,426	6,438	
Lime	6,438	6,447	
Dark slate	6,447	6,465	
Lime	6465	6,470	
Dark slate	6,470	6,500	April 13, 1917.
Black slate	6,500	6,505	Shut down 2 months
Black lime	6,505	6,510	repairs to rig,sand
Black slate	6,510	6,532	reels, waiting for
Dark slate	6,532	6,580	cable, etc.
Dark slate	6,580	6,625	
Hard shells	6,625	6,627	
Brown shale	6,627	6,640	
Hard shells	6,640	6,645	
Black slate	6,645	6,600	June 29, 1917.
Black shale	6,660	6,676	
Black sand	6,676	6,680	
Hard lime	6,680	6,690	
Dark slate	6,690	6,714	
Dark lime	6,714	6,747	
Hard shells	6,747	6,755	July 7, 1917.
Slate	6,750	6,755	
Dark slate	6,755	6,775	
Hard sand shells	6,775	6,780	
Black shale	6,780	6,800	
Black slate	6,800	6,823	July 13, 1917.
Hard lime	6,823	6,865	Shut down 1½ mo
Lime shells	7,057	7,069	
Hard sand	7,069	7,071	November 2, 1917.
Hard lime	7,069	7,075	November 16, 1917.
Lime	7,081	7,093	
Hard lime	7,093	7,097	
Hard lime	7,097	7,110	December 21, 1917.
Slate and shells	7,110	7,150	
Slate	7,150	7,160	
Hard lime	7,160	7,162	
Lime shells	7,162	7,176	January 4, 1918.
Gritty shells	7,176	7,190	
Slate	7,190	7,225	
Slate	7,225	7,232	
Hard shell	7,232	7,245	
Black slate	7,245	7,251	
Slate and shells	7,251	7,256	
Hard lime	7,256	7,261	
Dark hard lime	7,261	7,266	
Black slate	7,266	7,280	
Hard shells	7,280	7,282	
Slate	7,282	7,290	
Soft slate	7,290	7,295	
Soft black slate	7,295	7,300	
Black slate	7,300	7,345	January 18, 1918.
Gritty lime	7,345	7,363	February 1 to Mar 1, 1918, shut dow taking tempera tures and repair ing rig.
Hard flinty limestone, Corniferous, to bottom	7,363	7,386	March 1-4, 1918. March 4, 1918, cabl parted 2,000 fee above bottom.

SIZE OF HOLE:

16 in. in diameter to depth of 217 ft.
13 in. in diameter from 217 ft. to 1,238 ft.
10 in. in diameter from 1,238 ft. to 2,307 ft.
8 in. in diameter from 2,307 ft. to 7,071 ft.
6 in. in diameter from 7,071 ft. to present depth.

CASING:

217 ft. of 13-in. casing, set in slate.
1,238 ft. of 10-in. casing, set in Big Lime.
2,307 ft. of 8¼-in.casing, set in Bayard Sand.
1,666 ft. of 6-in. liner, set in well at 5,405 ft. to 7,071 ft. to protect hole from cavings.

RIG:

Standard (wood), 96 ft. high, with 22-ft. base of extra heavy timbers, Bull wheel shaft 24 in. in diameter with Bull wheels 10 ft. in diameter, triple tug, having two 10 ft. brake wheels, with 14 in. brake band on one side, 10 in. on other side; three sets of bull wheels have been used. Band wheel is 14 ft. in diameter with 13 in. face, triple tug, carrying belt 18 in. wide, 150 ft. in

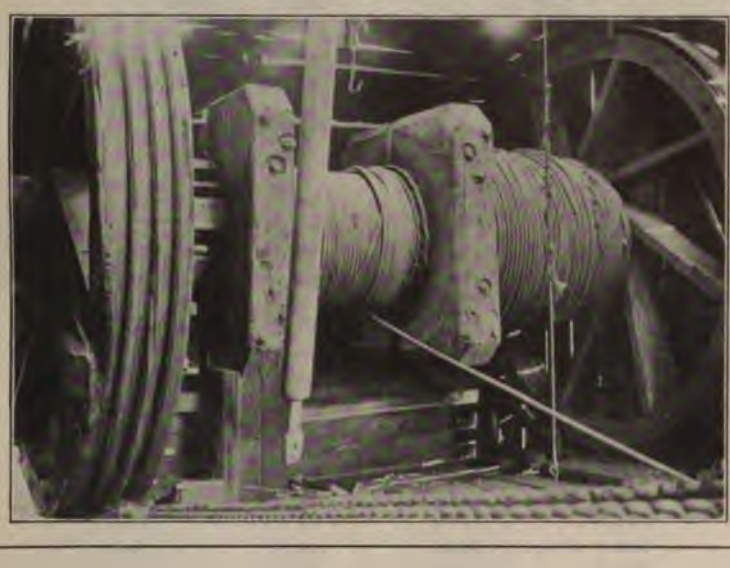
There is no difficulty to him who wills.—Kossuth.

The law It has honored us may we honor it Webster

thinks cannot be trusted as accurate, and he would treat it as a "scrap of paper" until confirmed by other methods free from possible error, since practically all of the deep well temperatures recorded in this country agree fairly well with the results at the Goff well for corresponding depths; the Wheeling, W. Va., deep well having a temperature of 110.3° F. at 4,500 feet, and the Wm. Bedell deep well near West Elizabeth, Pa., having a temperature of 127° at 5,500 feet, as determined by the late Prof. Wm. Hallock of Columbia University.

SUMMARY OF RECORD.

This long column of deposits might be summarized as follows, beginning at the base of the Pittsburgh Coal, 200 feet above the mouth of the boring.



			Thickness Feet.	Total Feet.
Pittsburgh Coal, base of Monongahela Series.				
Conemaugh Series	600′			
Allegheny Series	290	Pennsylvanian..	1,150	1,150
Pottsville Series	260			
Mauch Chunk	260′			
Mountain (Greenbrier) Limestone	65	Mississippian...	590	1,740
"Big Injun", "Squaw", and "Berea" Sand Group	265			
Catskill, containing Venango Oil Sand Group, to base of "Bayard" Oil Sand..	770′			
Chemung Shales, containing "Elizabeth", Speechley, Bradford (Benson) and Kane Oil Sand horizons...	2,190	Upper Devonian Shales.....	5,823	7,563
Portage beds	1,207			
Genesee Slate	288			
Hamilton and Marcellus	1,368			
Corniferous Limestone to present bottom.....			23	7,586

The great thickness (5,823′) of the Upper Devonian beds, or the measures lying between the Berea Sand and the top of the Corniferous Limestone in the Goff well reveals an unexpected increase in these strata from the region of the Geary well on southward. This thickening is shown graphically on the diagram giving these shales at only 1,775 feet in the Seiberline well just south of Akron, Ohio, 4,386′ in the Geary well, near McDonald, Pennsylvania, and 5823 feet in the Goff well in West Virginia. The diagram also shows that while the Goff well is 138 feet deeper than the Geary well, yet the latter owing to this great thickening southward penetrated the geologic formations to a depth of about 1,200 feet farther than the Goff, while the Seiberling well (in which the "Clinton" or Medina Sand was struck at 3,500 feet or 1,240 feet below the top of the Corniferous Limestone) had passed through the geologic column near Akron several hundred feet further at 3,749 feet, its total depth, than had the Geary well at 7,248 feet, although the Seiberling well started only (1,622—385) 1,237 feet geologically below the Geary well, the base of the Berea Grit comingat 385 feet in the former and 1,622 feet in the latter. Hence, in figuring the depth to Ohio's Clinton Sand at any locality in Western Pennsylvania, West Virginia, or southern Ohio, this thickening of the Devonian Measures must be taken into account.

The author has under preparation a paper soon to be published in one of the West Virginia Geological Survey volumes, giving a more comprehensive treatment of this thickening, based upon the study of a large number of deep well records and with this will be published a map showing by contours the approximate depths of the Corniferous Limestone below the Berea Grit at all points from the Goff well southwestward, westward and northeastward in the adjoining regions of West Virginia, Ohio and Western Pennsylvania. This contemplated map should serve as a useful guide to the oil and gas operators should any of them, like the Hope and Peoples Companies, undertake to prospect for these deeper sands; viz., the Oriskany and "Clinton" (Medina). It should be stated for the encouragement of any such efforts that although the Hope Company has not yet succeeded in penetrating to the Clinton Sand anywhere in its deep drilling efforts in West Virginia, it has nevertheless succeeded in developing three or four deep gas horizons below the geologic level of the Bayard Sand, the customary horizon at which most wells have been stopped in West Virginia; viz., at 2,400 to 2,600 feet below the horizon of the Pittsburgh Coal. One of these deep horizons found in Barbour, Harrison and Lewis Counties, lies about 4,350 feet below the Pittsburgh Coal, and approximately 2,800 feet below the top of the Big Injun Sand. It is known as the Benson Sand (from the farm of J. C. Benson in Barbour County, where it was first developed at the Hope Company's well No. 3,612), and appears to represent either the "Bradford" or "Kane" Sand horizons of Northern Pennsylvania, and is apparently the deep one called "Bradford" found by the Peoples, Philadelphia and other gas companies, in Westmoreland and adjoining counties of Western Pennsylvania, at about 3,850 feet below the Pittsburgh Coal, or 2,700 feet below the top of the Big Injun Sand. The volume of the Ben-

It is as difficult to appropriate the thoughts of others as it is to invent.—Emerson.

son Sand wells yet found in West Virginia is only 300,000 to 800,000 cubic feet, but the rock pressure is 1,800 pounds to the square inch, and possibly greater, and hence with the increased price which all natural gas owners trust that thsi matchless fuel may bring in the near future, it may become profitable to drill many wells down to this deep horizon, especially any that have become greatly depleted in higher sands.

Another sand 300 feet above the Benson has been developed in the M. D. Reiley well No. 5048 of the Hope Series, Barbour County, and this may possibly represent the true Bradford Sand, while the Benson horizon found in the same well at 4,403 feet may be the Kane Sand.

Then, in another well near Good Hope, Harrison County, a productive horizon yielding over a million cubic feet daily has been found by the Hope Company at 1,424 feet below the top of the Big Injun Sand, or practically 3,000 feet below the Pittsburgh Coal in that region. This may possibly represent the Elizabeth Sand of Pennsylvania, since in Harrison County, West Virginia, the Gordon Sand comes in round numbers 800 feet below the top of the Big Injun; the Fifth, 900 feet; and the Bayard, 1,000 feet below the same horizon, or it may represent simply a local lens of coarser sand in these Chemung beds of the Upper Devonian.

The Oriskany Sandstone lying just below the Corniferous Limestone and which was 270 feet thick in the Geary well, but filled with salt water, may possibly be another source of gas on the larger folds or anticlinals of West Virginia and Western Pennsylvania and this should be accessible within depths of 4,500 to 5,000 feet along the Ohio River between Beaver and Parkersburg.

AMERICAN CHEMISTRY AND AMERICAN INDUSTRY

At the conclusion of an address by Doctor J. B. Garner of Mellin Institute, Pittsburgh, before the Natural Gas Association of America, the Doctor made the following most interesting satement.

I BELIEVE that this is the most remarkable period of American industry. As chemists we have always been taught heretofore to look to the East—to Germany for inspiration. What we were not doing we always contented ourselves with stating the German was doing. But what of the situation today? We have reached a place right now where American chemistry is going to be the leader in the world; (great applause).

If American chemistry is going to lead the world, it must lead American industry as German chemistry has led German industry. American chemistry, therefore, must have the support of American industry to realize this goal and you can see from a perusal of the meetings of the Chemical Societies throughout the country, that the American chemist is alert to his opportunities and he is going to be on the job.

We are certainly going to do everything that Germany has ever done and we are going to do it in a better way (long continued applause).

I think that the campaign of American supremacy, scientific and industrial, can be started by The Natural Gas Association of America authorizing the appointment of a Committee to collect all of the information that is available for the future of the industry along these lines. I thank you very kindly, gentlemen (great applause).

There are many things going on in the way of chemical research at Mellin Institute, that will be of great future value. In the Institute today we have about thirty-five different industrial corporations represented in the doing of research work.

Among these is an extensive bread-baking company which has three men there working continually in the development of a new process for their product, while a number of other companies maintain fellowships. Such research work is the raising of the curtain upon a new era of service staged in the United States of America.

In addition we are doing a lot of secret work for the United States Government.

VALUABLE GAS-MEN'S BOOKS.

WE are advised that the second issue of the work entitled "Handbook of Casing Head Gas," by Henry P. Westcott, has just appeared. The book has been carefully revised. It has over 400 pages of *new* material and 110 *new* illustrations from photographs taken by the publisher's own photographer.

There are seventeen chapters, 580 pages, 150 illustrations 170 tables. Five chapters discuss the latest features of the absorbent process as applied to Casinghead and "Lean" gas, in the preparation of which Mr. Westcott, the author, was assisted by Mr. P. M. Biddison and Mr. H. T. Boyd.

The pocket size, is 4⅝ inches by 7½ inches. There are two styles, cloth bound at $3.00, and leather bound at $4.00. The work is published by the Metric Metal works of Erie, Pa., publishers also of a "Hand Book of Natural Gas," containing over 200 pages of *new* material and 100 *new* cuts, in the second edition.

The Metric Works publishes as well the work entitled "Measurement of Gas by Orifice Meter," 400 pages, 300 sets of tables, and also "Measurement of Gases where Density Changes," a work especially valuable where natural gas is measured at pressures other than "low pressure."

This work on the part of the Metric Metal Works and Mr. Westcott has added wonderfully to the printed resources of the natural gas and gasoline field of production, distribution, etc., in the United States.

DOING HIS BIT.

"Are you doing your part toward the conservation of gasolene?"

"I am that," replied Mr. Glithery, in convincing tones.

"But you have no motor car. In what way?"

"I haven't had a suit cleaned in six months."—Exchange.

Occupation is an infallible specific for depression.—Herbert Kaufman.

HOLD YOUR LIBERTY BONDS.

NEXT to the imperative duty of American citizens to support the Liberty Loan is their duty to hold their Liberty Bonds. It is not full service to the country to purchase Liberty Bonds and then throw them upon the market, thus putting upon others the real burden of financing the war. Unless the necessity for disposing of them is very great, every owner of a Liberty Bond should hold fast to it.

Holding onto one's bonds means that one has not only lent so much money to his Government but also that he is not spending that money for goods, labor and transportation needed by the Nation in the prosecution of the war, and is thus leaving the resources of the country more freely at the disposal of the Government as well as giving it financial backing. This is a double service.

Secretary Baker says that the wide distribution of the Liberty Bonds amongst the mass of the American people makes our Liberty Loans the soundest national financing in history. It is a good thing for every Liberty Bond holder to be a creditor of his or her Government, and it is a good thing for the Nation for its obligations to be widely scattered amongst its citizens and not congested into the hands of the rich. It is a most hopeful thing for the United States that the best investment in the world, the Liberty Bonds, are very widely distributed amongst millions of its citizens.

Judging the future by the past, our Government bonds issued during this war are going to rise greatly in value with peace. In 1888, 4 per cent United States Bonds sold in the open market as high as $130, and in 1901 brought over $139—that is, $139 and some cents for a $100 bond. That the Liberty Bonds are going to rise well above par in value is something that the most conservative will admit is well within the bounds of possibility.

The shrewd and unscrupulous, the birds of prey in finance, realize the worth of Liberty Bonds, and are going to use every effort to secure them from the hands of those owners of them who are uninformed or who are ignorant of stock and investment values. The favorite method will probably be offering stock of wildcat companies or other speculative ventures. Speculative is really too conservative a word to apply to some of these stocks, since to say that they have a speculative value is flattering in the extreme; they have no value at all, except in the hands of unscrupulous people, who trade them for money or Liberty Bonds to ignorant investors.

Some of the get-rich-quick schemers propose not to trade their gold-brick stock for Liberty Bonds, but to lend their clients money to buy their stock, taking Liberty Bonds as security. This is camouflage—only a thinly disguised method of securing Liberty Bonds for worthless or near-worthless stock.

Every holder of a Liberty Bond before he disposes of it, and especially before he trades it for stocks or other bonds, should consult a bank. Much money will be thereby saved to the owners of Liberty Bonds and the finances of the American people be better conserved.

OIL FOR SHIPS.

EVEN though the war has come to a close, we have in the neighborhood of 2,000,000 men on the other side of the Atlantic. Eventually these men must be returned to the States. In the meantime, even though the return period may be somewhat in the future, the vast number of ships afloat both of our own and of our Allies, must be kept in motion in order that supplies may not only be conveyed to the men of the United States in foreign lands and the armies of the Allies, both required now for police duty in various sections of foreign territory, but we must help feed and supply various necessaries to a vast number of citizen souls of our Allies not only, but in Germany who will to no small extent come upon us as temporary dependents. For this reason every effort must yet be put forth by our oil industry, whereby to supply needed fuel to ships now afloat and as well to ships that will soon be floating, now under construction.

It is to the credit of the oil industry that it has so nobly served our ships, thereby making possible to transport the two million men with supplies, ammunition, equipment, etc., that turned the tide at a time when long-suffering France was about to be overcome by her arch-enemy, and the arch-enemy of the men, women and children of the world at large.

Let the oil industry continue its good work, doing its utmost thereby to make the overseas service as great a success now following the war as during the past four years and more of hostile times.

FUEL SAVING BY INDUSTRIAL PLANTS.

THROUGH the co-operation of the industrial power plants, which have thus far put into force the standard recommendations of the United States Fuel Administration to promote efficiency in the use of fuel in power plants, a saving of seven million tons annually has been effected. That is to say, in the first six months from the announcement of the National program, three and one-half million tons have been conserved, at the same time maintaining maximum production in the factories. The largest savings have been in the following states: Massachusetts, Pennsylvania, Connecticut, Illinois, New York, Missouri, Michigan, Minnesota and Wisconsin.

***Thought* is the spirit of which words are embodiment.—Akenside.**

Birth of an Industry

California's First Oil Well as it Appears Today; Was Drilled in 1879 and Yields Three Barrels Per Day of 38 Degree Gravity Oil at the Present Time.

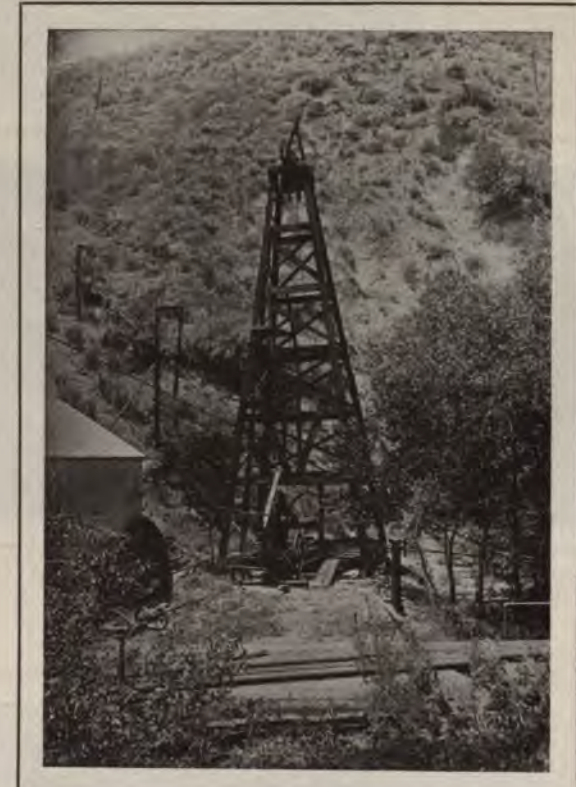
ASIDE from what interest bygone events may have on account of their picturesque features, glimpses into the past are of certain value in that they afford a means of gauging progress that has been made. Reasoning thus, the *Bulletin* offers its readers the following data relative to petroleum history in California. The late D. G. Scofield, former President of this company, while in a reminiscent mood, once stated that the first known discovery of petroleum in California was made by sheepherders while running their flocks in the mountain pasturages of Santa Barbara County in 1860. He also mentioned attempts made at oil production in Ventura and Humboldt Counties in 1864 and 1865. However, these efforts have no continuation, so far as we have been able to learn, in later petroleum history, so it seems that California's oil industry had its real birth as related herewith:

A Mexican hunter, who had followed a deer trail to the head of Pico Canon, in Los Angeles County, near the present town of Newhall, came upon a seepage of sticky, black fluid that was unknown to him. Presumably prompted by curiosity, he collected a small quantity of it in a canteen and took it back to the mission settlement at San Fernando. There a Doctor Gelsich, who had formerly resided in an oil-producing district of Pennsylvania, immediately identified the canteen's contents as petroleum. He lost no time in forming a company and staked out placer claims covering the find. That was in 1865, and in 1870 a shallow well was drilled at the head of Pico Canon by the old spring-pole method, the driller being one Sanford Lyon. This well is said to have produced at the time of drilling between seventy and seventy-five barrels of oil per day.

After the completion of the well, C. A. Mentry was placed in charge of the work as manager. D. G. Scofield at about this time formed what was known as the California Star Oil Company. Later the Pacific Coast Oil Company was formed, and the two companies were operated under the same management—C. A. Mentry being field superintendent and Mr. Scofield vice-president and general manager.

The first steam engine was brought into Pico Canon in 1879 and installed at the old spring-pole well, which was then redrilled to a greater depth. Photographs of both this engine, which today is on the original location and in good running order, and of the well are reproduced herewith. The latter, known as the "California Oil Works Company Well No. 4," is at the present time producing three barrels per day of 38° gravity oil, and, if our data is correct, stands as the first and oldest oil well in the State. It is the property of the Standard Oil Company (California), for the holdings of the original operators were taken over by this company about fifteen years ago.

Old "No. 4" is no Lakeview or Mayes. It has not astonished the nation with its volume of product. It has not been much of a factor in California's great petroleum



FIRST OIL WELL IN CALIFORNIA—DRILLED IN 1870.

industry as we know it today, but, while hundreds of wells since drilled haven't even a derrick left to mark their one-time location, "No. 4" is still alive, still produces; it is a working monument commemorating the beginning of things petroleum in California.

Pico Canon, where this historical well is located, is a part of that California oil district known as the Newhall fields, which include as well Wiley and Elsmere canons. To those whose conception of the California fields has been gained through views or descriptions of the state's great Midway field, the Newhall district will not look like oil territory, for topographically the two fields have almost nothing in common. The former is a great flat

Principle is ever my motto, not expediency.—Disraeli.

"MENTRYVILLE," A STANDARD OIL "CAMP," OCCUPIED BY SUPERINTENDENT WALTON YOUNG.

FIRST STEAM ENGINE BROUGHT INTO THE PICO FIELD.

OLD ORIGINAL STILL BUILT IN 1875 BY SCOTT AND BAKER

MACHINE SHOP, BUILT BY C. A. MENTRY IN 1879.

Most of us are possessed of more ability than we use.

GENERAL CONTOUR OF PICO CANON, ALSO THE TWO STEEP SIDES OF THE ANTICLINE EXTENDING FROM THE WILEY TO THE PICO FIELD.

waste of sagebrush-covered desert, fringed by rolling hills, which wind and rain have in instances cut into fantastic forms. Rock formations and exposed ledges are seldom encountered there. The Newhall field, on the other hand, is largely the most rugged mountain country, whose precipitous canons often present a solid facing of jagged rock and projecting ledges. It looks like mountain-lion and eagle country, and, as a matter of fact, both were not uncommon here thirty years ago. The topography of the Newhall field is vividly suggested in the following brief sketch of its geology, abstracted from S. H. Gester's reports:

SHOWING THE PECULIAR RIGHT-ANGLE FOLD CAUSED BY THE SEVERE MOVEMENT THAT CREATED THE PICO-WILEY ANTICLINE.

A TYPICAL ATTITUDE OF THE STRATA IN THE PICO-WILEY ANTICLINE.

There's nothing like being used to a thing.—Sheridan.

"The age and structure of the formations penetrated by the wells of the Pico and Wiley fields are the same. In fact, the sharp anticlinal fold, often found to be overturned and severely contorted, is continuous for more than eight miles, extending in a northwest southeast direction through both the Pico and Wiley fields. The strata of this fold belong to a geological formation known as the "Vaqueros" and are of Lower-Miocene age. Because of the extreme sharpness of the fold, locations for productive wells are limited to a narrow belt along the apex of the anticline—a distance of 100 feet horizontally on either dip of the anticline will often necessitate a depth of 500 feet or more before the same sands can be reached by the drill."

Wells of the Elsmere field are started in a much younger formation than that of the Pico and Wiley fields, geologically known as the Fernando formation of Pliocene age. Here the strata dip in more or less one direction and therefore the wells are not located on such an anticline structure as those of the Pico and Wiley fields. Some of the Elsmere wells undoubtedly produce from sands of the Fernando formation, while deeper ones may also encounter underlying Vaqueros sands and produce oil from both formations.

—Courtesy Standard Oil Bulletin.

WILEY CANON SHOWING THE DIP OF THE STRATA—ON THE NORTH FLANK OF THE PICO-WILEY ANTICLINE.

ON CHANGING POSITIONS.

The man who repeatedly changes his position, who is always going from one job to another, is regarded as a man who has something wrong with his mental, moral or physical make-up. He is either inefficient, self-opinionated, hard to handle, lazy, intemperate, or perhaps dishonest. It is for you to find out.—Exchange.

KNOW THY MEN.

KNOW thy men." This is truly a business problem, and one that is worthy of a man's best study. Suppose that the men you have selected are not the right ones, this does not reflect on your ability, unless you keep them in places which they do not fit. If you have a man that does not fit, try him in another capacity, and still another. It is more than likely that he will develop great power in some part of your organization. If you cannot make him fit after due trial, let him go; for it would be far worse both for him and for you if you keep him. There is no doubt but that his correct place is waiting for him elsewhere.—Exchange.

NEW DRESSER CATALOGUE.

The S. R. Dresser Manufacturing Company has issued its Catalogue No. 18, showing the Dresser line of pipe couplings. The work is an unusually beautiful one from a mechanical standpoint, and is a fitting representative of the concern by whom it is ssued. The book comprises 111 pages, profusely illustrated with high class halftones, printed on heavy enamel paper. The illustrations show in detail the company's line of pipe fittings, and as well the Dresser fittings as applied in main and pipe line construction. An interesting series of illustrations shows the various departments of the Dresser plant at Bradford where Dresser couplings and pipe fittings are made.

The Dresser line comprises devices of many kinds for use in the artificial and natural gas industries, all fully described and illustrated in this very complete catalogue, a copy of which may be obtained by writing to the S. R. Dresser Manufacturing Company, Bradford, Pa.

Cato said the best way to keep good acts in memory was to refresh them with new.—Bacon.

WOMEN WAR WORKERS

COMPRESSOR DISPLACEMENT

The example of good men is visible philosophy.—Cowper

WELDING EQUIPMENT.

THERE is *equipment, and equipment* in the welding field. Some of the torches are good, others are super-good, while some are not even as good as the first named. We do not mean to suggest by this statement that welding-torches are sold like "Yankee notions" with a view to "skinning" the purchaser, but there is a selection, and it would behoove those who are purposing to adopt welding in their construction and reconstruction work, to carefully inspect the various torches manufactured, and to note every point offered by the manufacturers.

It is said, by many of the manufacturers themselves, that where it is convenient, it is better to use two separate torches when cutting and welding than to use a *combination cutting and welding* torch, although there are pieces of work and there is work under certain conditions that may be best handled with the combination torch.

Do not let men undertake welding without proper *eye-protection* and proper *hand-protection.* The eyes may be ruined, and the hands may be burned unless proper care is exerted.

There are goggles made by certain manufacturers of optical supplies, goggles that have been shown to be best fitted for this particular type of service. Then there are asbestos gloves made by certain manufacturers. These gloves will, as one might anticipate they would, so well protect the hands as to be an insurance against burns.

A thorough investigation is desirable before buying welding and cutting equipment. There is a choice.

"KEEP YOUR HEAD."

THE war has brought many new problems, and is laying on every one new burdens. Life is costing more in personal effort and in money. Personal effort consists of both labor and responsibility, which reduces finally to the expenditure of physical and nervous energy.

In finance, stability consists in the proper proportioning of income to expenditure. So, too, stability of health and prospects or the ability to stay fit and become more efficient depends upon how we use up and add to our stock of energy. The call for increased effort can best be met by the elimination of needless work, needless waste, needless expenditures, and needless worry.

Let us remember to keep our heads, to think and reflect about our work, our health, our civic duties. Many are becoming stampeded by the general restless spirit of the times, listening to and believing much that is contrary to the established order of their lives. Our fortunes are intimately bound up with the conflict in which we are engaged, which is all the more reason for our maintaining a sane and proper outlook upon the part which we are to play in it. We are coming to realize that we must all put forth our entire energies wherever the necessity arises, and whatever the personal sacrific may be. It may be that the position we now occupy individually is just as important as some other which at first thought might seem to offer better advantages or better remuneration. Let us not be misled by working standards set up during these disordered times; such standards are themselves abnormal and are sure to be displaced by saner conditions in the future. Reasoning out our place in the scheme of things, with an intelligent effort to adapt and adjust ourselves to conditions with which we are partially familiar, is better for us in general than a plunge into new conditions. the evils of which we know nothing.

Profound students of human nature say that it is very hard for the average individual to be honest with himself. If this is true we should be very careful in making decisions which may affect our own fortunes. The level headed man or woman is sure to win. Cultivate the habit of keeping cool, of looking at your own problems in a careful analytical way. Brains are at a premium. Remember the time honored watchwords:

"Keep your head."

—Rochester R. & L. News.

HIS LORDSHIP, THE OFFICE BOY.

SOME business men have a reputation for boorishness, and as a result they miss many good things which they might otherwise have. The "old man" sitting cloistered within his private office is too often found, if indeed it is possible to find him, a gruff and inconsiderate monster to many of his callers. There is likewise an overbearing outside sentinel or doorkeeper—sometimes a three-dollar-a-week boy or maybe a five-dollar-a-week girl—but in either case surcharged with impertinence, and an abomination in the estimate of those who desire to do business with the man who is barricaded within the private office. There is very little variation in the course of interrogation one must submit to at the hands of these buffers. "What do you want?—Well, Mr. X. is busy—Who are you?—You'll have to see Mr. Y., but Mr. Y. is away. He tends to all that business. You'll have to call again—What did you say your name was? Smitch? Well, spell it. Oh! Smith. Well, I'll tell Mr. Y." Isn't it about time that managers and proprietors of business institutions either place their desks outside of the partition walls where it is convenient for them to give callers a courteous greeting and a polite dismissal; or else install a telephone at the gate by which a business visitor may reach the manager's ear without the intervention of an inconsequential clerk.—Exchange.

Old Doctor Time will cure the past if you give the present a show.—Herbert Kaufman.

Solution of Gas Problem

A Proposed Solution of the Gas Problem at Kansas City, Mo. Forms a Report by a Special Gas Committee of the Kansas Chamber of Commerce.

SINCE gas conditions are *similar* in many cities, a solution of the Kansas City gas problem would help gas companies elsewhere, and municipalities elsewhere in arriving at what might be *their solution.*

At one time the Kansas City committee was in almost constant session for a week with Henry L. Doherty of the Cities Service Company. Written and oral statement secured from all interested parties produced much interesting and valuable data, and while the report as submitted is not final, it outlines a general plan along which it is thought possible to work to conclude settlement.

The proposed solution was by the committee submitted to the Chamber of Commerce through the authority and with the approval of the Board of Directors.

The full text is here presented. The work of analyzing the evidence, and information secured, and of writing the report was done by Mr. Walter Matscheck, Secretary, and Mr. H. H. Mathonet of the Department of Cities of the Kansas Chamber of Commerce.

Reference to the report was made in remarks offered at the Natural Gas Convention in Pittsburgh, and were subsequently reported in THE NATURAL GAS AND GASOLENE JOURNAL.

1. Present Conditions.

(a) The shortage of natural gas during the past winter is too fresh in the memory of the people of Kansas City to need rehearsal here. In certain sections there was no supply and in other portions of the city, the supply was so inadequate and the pressure so weak that the gas served through the mains was not usable. This condition is merely an exaggeration of the situation which has prevailed for several years past, and which reached its climax in the extreme weather of last winter. It is an intolerable condition and must be remedied.

(b) *At present the outlook is not much better for next winter.* Some extensions have been made in the gas fields, but they are not sufficient to insure an adequate supply of natural gas for Kansas City. During the month of April, all of the gas that it was possible for the Kansas Natural to deliver to Kansas City was barely enough to supply the demand, and on several occasions, pressure fell so low at the city gate that certain sections of the city were without adequate supply.

(c) The war has disturbed market conditions and depleted the labor supply. Funds for industrial development are unobtainable through the usual channels. These are facts that every business man is compelled to face daily, and public utilities are feeling the pinch more than the average business. To meet the requirements of the situation as it now exists is the problem that faces Kansas City. Several facts stand out as a basis on which all can agree:

1. *Kansas City must have an adequate supply of gas,* natural or artificial, for cooking and lighting purposes.
2. *Kansas City must have this gas at once,* so that the suffering and loss occasioned by last winter's failure of the gas supply may not be repeated. If some settlement is not made with dispatch, the supply will continue to depreciate, as at the present time lack of funds makes it impossible for the producing company to make any effort to increase the supply.
3. It would not be possible, even under normal conditions, for the Kansas City Gas Company, which is the local distributing company, to restore its artificial gas plant so that the same could be put in operation in less than a year's time, and more probably it would require eighteen months. And after the plant is in operation, it is estimated that it could supply only one-half of the necessary gas to give Kansas City an adequate supply of the manufactured product. Therefore, it follows that it must necessarily be natural gas on which we are compelled to depend during the coming winter.

(d) *The people of Kansas City must have gas.* Under present conditions and at the present time, at least, it would be difficult to get along without gas for lighting and cooking purposes.

(e) Equally certain with the statement that the people must have gas is the proposition that for the past few years there has been a very inadequate supply. *Ever since the natural gas fields began to run out, Kansas City has been a sufferer because of a deficient supply.*

(f) It is equally certain that *the time is coming* within a short time—it may be three or four years, or it may be twenty—*when the available supply of natural gas will be gone.* Any plans for future gas must take this fact into consideration.

(g) The settlement of the gas difficulties has been deeply involved in legal proceedings. Nearly every move of any of the several companies has been the subject of a suit. A discussion of the gas situation by an organization not interested in any of the companies may well ignore the various legal technicalities and proceed on the theory

Facts are stubborn things.—Smollett.

that if a practical working solution is found for the entire problem, the co-operation of the various parties interested can be secured and the legal difficulties avoided.

(h) It is possible to provide Kansas City with a supply of artificial gas, but to do so will take time. Also building costs at the present time are very high, and will reflect themselves in the cost of the artificial product.

(i) The case from the standpoint of the people of Kansas City is just this:

They must have gas.

They are not getting sufficient gas now during the winter months.

The natural supply will give out soon and has already partly given out.

They are willing to pay a reasonable price so long as they get the gas.

2. History.

Kansas City has not always had natural gas. About twenty years ago, under an old franchise, Kansas City was paying $1.50 per thousand cubic feet for artificial gas. On the expiration of this contract, two companies were given franchises, and there followed a gas war, which forced the price down to 50 cents a thousand cubic feet. This lasted for a short time, when the companies consolidated, and the price was fixed at $1.00 per thousand cubic feet.

Soon after this the natural gas fields in Kansas and Oklahoma were developed, and gas piped to Kansas City and sold at a price of 25 cents per thousand cubic feet. Since that time the supply has been running low, the Kansas Natural Gas Company has gone into the hands of receivers, and the *price fixed by judicial order* at 60 cents per thousand cubic feet. The supply of gas is now inadequate to meet the demand, and has been so for several years. Since February 10th, however, there has been sufficient gas for domestic use.

3. The Companies.

(a) *The Kansas City Gas Company.*

Under the present arrangement, *this Company is a distributing company.* It buys natural gas from the natural gas compaies and distributes the same through its mains to the local consumers. Under its franchise *it is not obligated to furnish any more gas than is supplied to it by the producing company.* The City *may order it to manufacture gas* however, whenever it is decided that the supply of natural gas has run out.

(b) *The Natural Gas Companies.*

There are five leading natural gas companies connected with the system which supplies Kansas City. These are:

The Kansas Natural Gas Company.

The Quapaw Gas Company.

The Empire Gas & Pipe Line Company.

The Wichita Pipe Line Company.

The Wichita Natural Gas Company.

These are all owned by the Cities Service Company, a holding company of which H. L. Doherty & Company are the principal owners.

4. Natural Gas.

(a) *Past Supply.*

When the Kansas and Oklahoma gas fields were at their best, there was an adequate supply of natural gas for lighting, cooking, and even for heating and power purposes, in Kansas City. With the falling off of the supply, however, it became necessary to shut off the supply for power and heating purposes, so that now gas is supposed to be used only for cooking and lighting.

(b) *Present Supply.*

During the winter of 1917-1918 there were times when there was practically no gas. The *approximate normal daily needs* of the two Kansas Cities at the present price vary from 15,000,000 *cubic feet to* 25,000,000 *cubic feet.* The average number of cubic feet *delivered daily* for use in both Kansas Cities during *December,* 1917, *was* 7,331,000 *and in January,* 1918, *was* 6,045,000. From these figures it is evident that there was a great shortage during these months. Since February 10th, when the Empire Company's improvements were completed, there has been enough gas with the exception of a few cold days in April.

(c) *Distribution of Natural Gas as Between Cities.*

There are about one hundred cities, towns and villages which compete with Kansas City for gas. Under court order the cities and towns on the Kansas Natural lines are *supplied in proportion to their consumers on the theory that since there is not sufficient gas to go around, what there is should be equitably distributed.* An analysis of the records should be undertaken to determine whether Kansas City receives its fair share, and provision should be made that the correct supply be furnished. The total present daily production of the wells supplying Kansas City is 625,000,000 cubic feet open flow, or perhaps 150,000,000 cubic feet for deliverly. The total average daily demand for cooking and lighting purposes in Kansas City is estimated to be approximately 7,000,000 cubic feet. *There are* 198,000 *meters on the Kansas Natural and Empire lines. Kansas City has approximately* 65,000 *meters.* Thus Kansas City has approximately one-third of all the meters. *One-third of the available gas would be far more than Kansas City's demand for cooking and lighting.*

(d) *Future Supply.*

There may be an adequate supply of natural gas available, if Kansas City is willing to follow the trend of the fields, and pay the necessary price to get it. The first fields which supplied Kansas City were in nearby Kansas and Oklahoma territory. The later fields are farther south. New fields still farther away are being opened. The trend of the fields is toward the Gulf and constantly farther away from Kansas City. There is a question *whether it would be profitable for Kansas City to pay the necessary price to get gas from such distant fields.* At the present time the supply of gas is larger than it was during the winter. This is due to recent extensions of pipe lines by the Doherty interests.

(e) *Recent Extensions.*

During the winter of 1917-1918 the Doherty interests *laid* 113 *miles of pipe lines.* A portion of this was taken

Who cannot give good counsel? 'Tis cheap, it costs them nothing.—Burton.

up from the old gas fields or old lines and relaid to newly-developed territory. One of these lines, a 16-inch line, connects the Kansas Natural lines with the Blackwell gas field, a new field of great promise and now giving a large yield. Another portion connected the Kansas Natural lines with the lines of the American Pipe Line Company, which has recently been purchased by the Doherty interests. *There were also bought 268 square miles of gas leases* from this company in the Osage country. *Still another portion of this new mileage was laid into the Osage-Hominy field* to make available more of the gas in that field. In addition to extensions of pipe line, *several compressing stations were moved and rebuilt and others rehabilitated. One hundred and thirty-two new wells were drilled* to supply the new lines. *These improvements represent the expenditure of approximately* $2,500,000. They have added a maximum of 30,000,000 cubic feet a day to the Kansas Natural lines, and more was available but was not needed.

5. Gas Supply and Demand.

(a) The records of the Kansas Natural Gas Company show the following deliveries of natural gas since the completion of the extensions made by the Doherty interests into which the gas was turned February 10, 1918:

February 10th to 28th inclusive..... 21,986,333 cubic feet per day
March .....21,535,904 cubic feet per day
April .....23,723,206 cubic feet per day

Maximum delivery in any one day, on April 26th, 28,353,000 cubic feet delivered at the city gates. (These figures include the two Kansas Cities.)

Since the average demand for purely domestic gas in Kansas City will probably not exceed seven million cubic feet daily, based on the statistics of other cities (see Table 1), with a liberal allowance for additional gas consumed because of the extravagant use due to the very low price at which it previously has been sold here, it follows that some means must be used to increase the visible supply or restrict the demand to the supply obtainable. To increase the supply involves the expenditure of large sums of money, and the use of materials and labor, all of which are difficult, if not impossible, to obtain, except at excessive cost. *Demand can only be restricted by the price,* and the consumption here of from two to three times the amount of gas consumed by cities on an artificial gas rate, demonstrates that Kansas City is using gas for heating purposes at 60 cents. It is a further fact that the *ordinance passed by the City Council restricting the use of gas to purely domestic purposes is not effective,* since the consumption record demonstrates its violation. It is also unfair to permit an institution like a large hotel to use five or ten thousand cubic feet a day for cooking purposes and for heating water for the numerous baths and domestic purposes in a hotel, and deny the small home owner the privilege of using a like amount of gas for heating his home, provided he is willing to pay the same price as the hotel. *All consumers of like amounts* should *be on the same rate basis, regardless of the purpose for which the gas is used.* It therefore follows that the rate must be restrictive enough to prevent the use of gas for heating purposes.

During the past winter there was great inequality in the distribution of gas as between consumers because of the use of boosters, or gas pumps. Not only is this practice unfair, but it is dangerous. The use of such pumps should be prohibited.

(b) Table 1 shows the consumption of artificial gas per 24-hour day in eight cities, the rates charged for same, the number of consumers, and figures on a basis of 65,000 meters in use in Kansas City, what the consumption in Kansas City would be if each meter had used a like quantity of gas as used in these several cities. From this we deduce that a plant of 7,000,000 cubic feet capacity (artificial gas) would amply meet the average requirements of Kansas City. A plant of 10,000,000 cubic feet capacity would fill all requirements.

TABLE I.

Consumption of Artificial Gas in Eight Cities and Kansas City's Consumption if on Same Price Basis.

City	Domestic Gas Consumed Per Day	Number of Consumers	Net Rate	Estimate K. C. on Same Basis	Date of Information
Baltimore ...	16,069,000	142,629	.85	7,006,000	Yr. 1917
St. Louis	18,000,000	165,000	.85	6,758,000	Yr. 1917
Atlanta	3,000,000	28,000	1.10-.80	6,634,000	Yr. 1917
Detroit	22,000,000	173,000	.85	7,874,000	Yr. 1917
Denver .....Av.	5,000,000	45,000	.95	6,882,000	Yr. 1918
Providence ..Av.	5,500,000	63,000	.95	5,394,000	Yr. 1917
Minneapolis .	8,000,000	85,000	.92	5,828,000	Yr. 1917
Indianapolis ..	8,000,000	59,788	.55	8,370,000	Yr. 1917

Table II shows cities using artificial gas at prices shown in column 1.

For amount of artificial gas equal in heating value to 1,000 cubic feet of natural gas, the price would be as shown in column 2.

If Kansas City had used the same amount of gas per consumer the quantity of artificial gas needed for Kansas City would be as shown in column 3.

This would correspond to the amount of natural gas shown in column 4.

The natural gas required in Kansas City to give the same service as used in each city shown on list would be the amount shown in column 4.

TABLE II.

Comparison of Natural and Artificial Gas Values.

	1	2	3	4
	Rate	Equivalent Natural Gas Rate	Kansas City's Daily Artificial Gas Quota	Kansas City's Daily Natural Gas Quota
Baltimore	.85	1.42	7,006,000	4,203,000
St. Louis	.85	1.42	6,758,000	4,054,000
Atlanta	1.10-80	1.83-1.33	6,634,000	3,981,000
Detroit	.85	1.42	7,874,000	4,724,000
Denver	.95	1.58	6,882,000	4,129,000
Providence	.95	1.58	5,394,000	3,236,000
Minneapolis ...	.92	1.53	5,858,000	3,496,000
Indianapolis ...	.55	.92	8,370,000	5,022,000

About eighteen months ago Mr. Doherty, representing the *Kansas Natural and other subsidiary companies,*

There is no debt with so much prejudice put off as that of justice.—Plutarch.

promised to expend at least two million dollars in the gas fields and on pipe lines to secure an adequate supply of natural gas for the cities on the lines of these companies. The Chamber of Commerce has employed the firm of Marwick, Mitchell, Peat & Company, certified public accountants, to verify the expenditures and report the exact amount which the Doherty interests have spent for this purpose.

Work on this audit is well under way and when the report of the auditors has been made it will be filed as a supplement to this report.

(c) *Rehabilitating Old Plant or Building a New Plant by the Kansas City Gas Company.*

In June, 1917, the *Kansas City Gas Company filed a petition with the Public Service Commission for authority to construct additions to its gas manufacturing plant at a cost of* $1,800,000. It was expected that the expenditure of this amount at that time would provide a plant, part new and part old, with a water-gas capacity of 10,000,000 cubic feet per day. The petition asked the Commission to fix rates for natural gas when natural gas only was being furnished, as well as for mixed artificial and natural gas, and for artificial gas alone. The Federal Court had meanwhile decided that the furnishing of natural gas was interstate commerce and that the Commission had no jurisdiction to fix rates. The company then amended its petition and finally withdrew it on the grounds that the war had made the purchase of necessary material impossible, and that the money was not available. This is now a difficulty with which any attempt to build a new plant will meet.

6. Plan Proposed.

(a) *Temporary Rate.*

1. In order that the supply of natural gas may be conserved and built up to a point of highest efficiency, it would be necessary for the Doherty interests to develop new fields and to extend pipe lines to them. *At the present prices of labor and material, only about forty per cent of the necessary expenditure to do this is a capital charge, sixty per cent being the inflated value due to war conditions.* The Natural Gas Company will put back into permanent improvements every dollar of revenue over and above the purely operating expenses, and will not make a charge against its capital expenditures of any of the inflated costs. All excess over the present rate, as well as all of the *gross* earnings (income less operating expenses), will be used to develop and extend the properties. The excess costs due to war inflation will be amortised from his source and only the costs on a pre-war basis will be considered capital expenditure. This is just and equitable and will not permit the application to a public utilities commission for a rate based on such excess capital expenditure.
2. To meet the present emergency and supply gas for the winter of 1918-1919 and possibly the winter thereafter, it is recommended *that a customer charge of* $6.00 *per annum, payable in monthly instalments of* 50 *cents each, plus* 80 *cents per thousand cubic feet for natural gas consumed be the rate established.*
3. An 80-cent rate is suggested as the best judgment of this committee after having fully studied the situation as the most probable rate at which the demand for gas next winter will equal the supply. There is no precedent or experience table in existence where similar conditions can be analyzed which will enable us to determine what the rate of demand would be at an 80-cent price. *Experience has demonstrated that the 60-cent rate is not restrictive enough to prevent serious shortage at the present time,* with the prospect of less gas next winter than there is available at present.

(b) As soon as an agreement is reached, *the Doherty interests pledge themselves to begin immediately to install along the pipe lines at points nearest the coal fields, various manufacturing plants, the by-products of which will be a high grade of fuel gas,* these establishments being chemical plants whose output of artificial gas ultimately will be 30,000,000 cubic feet and more as needed. They also agree to assist in an effort *to have established within or adjacent to Kansas City a coke oven plant, the by-product of which will be approximately* 10,000,000 cubic feet of gas per day. Both of these plants can and will be started immediately (provided prompt action can be had to allow their location here instead of elsewhere), because *their principal products are chemicals now very much in demand by the national government for war purposes,* and the government,, through its Finance Commission and Priority Board, will assist very materially in the establishment of such plants, but it will require prompt action in order to secure them for Kansas City's needs.

(c) When an adequate supply of natural gas, supplemented by artificial if necessary, has been created, the Doherty Companies offer the following binding contract:

FOR NATURAL GAS.

Customer's charge, $6.00 *per year.*

Maximum demand charge, 32 cents a year each foot per hour.

Natural gas, 30 cents 1,000 cubic feet of 1,000 B.T.U's intensity.

FOR ARTIFICIAL GAS.

Customer's charge, $6.00 *per year.*

Maximum demand charge, 50 cents a year each foot per hour.

Artificial gas, 40 cents per 1,000 cubic feet of 1,000 B.T.U.'s intensity.

Or, if the manufactured gas contain less heat units, the price to be adjusted to conform to the 1,000 B.T.U. standard.

The artificial gas price to be based on $3.00 coal, which would necessarily require a differential rate in communities where coal was cheaper or more expensive.

Where artificial gas is mixed with the natural gas, the proportions of natural gas and artificial gas to bear their relative costs.

The customer's charge in both the temporary and permanent rates is a fixed service charge against each meter. This charge covers the carrying of such items of expense as are incurred in behalf of all customers alike. *The demand charge is in reality a charge for "readiness to*

The law hath not been dead, though it hath slept—Shakespeare.

serve the customer" and is the name of a system whereby the *operating and maintenance costs of providing gas service, not affected by the amount of gas consumed,* but incurred at an approximately uniform rate throughout the year, irrespective of the amount of gas used, shall be borne by the consumer in proportion to the greatest amount of gas which the company must be prepared to furnish at any time.

In operation, this charge serves the purpose of equally distributing the cost of gas service in scientific proportion to consumer's requirements, and of distributing the cost uniformly throughout the year.

The unit of measurement for this charge is the maximum rate of consumption measured in cubic feet per hour, which the consumer demands.

It is estimated that a maximum demand of 10 *to* 12½ *feet per hour is the amount required for heating purposes per room* where proper appliances are installed and ordinary economy of operation is practiced.

Under the straight meter rate system of charging for gas, if all of the consumers were to open their burners at the same time and begin the consumption of gas simultaneously, it would require a plant eighteen or twenty times the capacity of normal load, and under such rate *it is the practice of companies to establish from two to three times as large a plant as a steady normal demand would require.* With a demand charge, the company can regulate the amount of gas it contracts to deliver, and provide facilities for the delivery of the exact amount of gas the consumers require, thus conserving plant investment and gas supply, reducing costs.

It is unjust to require the small consumer to carry the same fixed charge for "readiness to serve" that the large consumer carries. Therefore, the "readiness to serve" charge is proven to be a fair method of distributing the load. The *amount of gas delivered is adjusted by the meters* so that the exact amount contracted for is the maximum which can flow through the meter in any given period.

Table III, herewith, shows the cost of gas under the 60-cent rate, under the proposed temporary rate, under the proposed permanent natural gas rate, and the proposed permanent artificial gas rate, together with a percentage table, setting out clearly, costs in various quantities of consumption.

Explanation of Table III.

Artificial gas on the same basis as natural gas requires about forty per cent more volume to attain the same number of heat units, as the manufactured standard is 572 B. T. U.'s per cubic foot and natural gas has 1,000 B. T. U.'s per cubic foot.

Under the plan proposed in this report the rate of 40 cents for artificial gas contemplates furnishing manufactured gas of 1,000 B. T. U.'s per cubic foot, or in other words, on the same basis as natural gas.

This is believed to be the lowest net rate for artificial gas offered in any city in the United States.

Under the plan illustrated all consumers would be on a par in carrying a share of the overhead burden in proportion to their individual requirements for service, and would pay for gas consumed at a minimum rate, because they would not be carrying a part of the burden of the customer who was not paying his just share of the overhead and carrying charges.

It will be seen from this table that on the proposed temporary rate the largest percentage of increase is on the smallest consumption, and that the increase grows smaller as the amount purchased grows larger.

For the proposed permanent rate for natural gas, there is an increase only up to 2,000 cubic feet. On amounts above this the charge is a decrease below the present rate of 60 cents until on an amount of 25,000 cubic feet there is a decrease of 38 per cent in the total rate. In the proposed permanent rate for artificial gas there is an increase on all amounts below 5,000 cubic feet as given in the table, and a decrease on amounts of 10,000 and above.

These various rates as given show that on the permanent gas rates which are to be established as soon as possible, if gas is purchased in quantities sufficiently large to provide for heating, it will be purchaseable at a lower cost than at present. For the very smallest consumer, whose present bill is not now more than 60 cents, there will be a large increase in the price. For the consumer who is consuming about 3,000 cubic feet, or whose present bill is now $1.80, there will be a decrease on a permanent natural gas rate, and a slight increase on the permanent artificial gas rate.

7. Guarantees.

(a) In order to take advantage of the rates as proposed, *it will be necessary that prompt action be taken,* as the unsettled condition of the financial and material markets may disturb the conditions in any proposed contracts, unless they are entered into at once.

(b) As a guarantee of good faith on the part of the Doherty interests, they advance the fact that without a contract of any sort they have *recently expended in excess of two million dollars to secure a supply of gas for Kansas City.*

(c) *The Doherty interests agree to enter into a firm contract to forego all interest and dividend charges until a permanent supply of gas, natural, supplemented by artificial if necessary, is built up.*

Under this contract it is proposed that all revenue be used to build up the properties.

At the increased rate for gas it is estimated that there would be only a slight increase in revenue as it is certain that the increased price will in some measure restrict consumption. *The increased revenue plus the interest and dividends earned on the entire investment in these properties, will be used to amortize the excess investment in the building of the pipe lines, compressors, artificial gas plants and other capital expenditures of the company,* which are incurred by reason of the necessity of doing this work during the war period and in an era of unprecedetedly high prices. *The amounts expended because of this inflation will not be included in capital expenditures and will not be used to earn further dividends or interest.* The sooner the complete amortization of such amounts is accomplished the sooner the permanent reduced rates can be put into effect.

No man will ever be tired at a crisis if he manages his mind right.—General Foch.

(d) *They agree to extend their pipe lines to secure the natural gas now available, to drill where possible to secure fresh supplies* and to extend their pipe lines to connect with new fields in the territory as it is opened.

(e) *The Doherty interests agree to have installed at some point in the coal fields of Kansas a chemical plant for the manufacture of chemicals, with a large supply of gas as a by-product.* This they can assure absolutely, since the Cities Service Company, of which Mr. Doherty is the head, will guarantee the bonds, and will contract for the supply of the by-product gas. They will also assist in having a by-product metallurgical coke oven plant installed adjacent to, or within, Kansas City.

8. Local Companies.

(a) *Any settlement of the gas question must take into consideration the interests of the local distributing companies throughout the entire system* as it is planned to have these proposals apply to all cities on the lines. The settlement proposed by the committee will give the local company the following portion of the gross receipts from gas sales:

On the temporary arrangement 100 *per cent of the customer's charge, and* 25 *per cent of the gas charge.* (Proper arrangements to be made to reduce leakage.)

On the permanent natural gas basis, to give the distributing company 100 *per cent of the consumer's charge,* 20 *per cent of the demand charge and* 20 *per cent of the gas charge,* the distributing company to stand all leakage, or in other words to pay for the gas received at the city gates.

On the permanent artificial gas basis, the distributing company to receive 100 *per cent of the customer's charge,* 15 *per cent of the gas charge, also to pay all leakage.*

The schedule of rates proposed is dependent on the division of the returns from the sale of gas between the producing and distributing companies. If the schedule provided and the distribution do not give both companies a fair return, readjustment either of the distribution or of the rate schedule will have to be made. The entire distribution is, of course, subject to change by the courts, or commissions, whichever has jurisdiction. The proposition is made on the assumption that both companies are to have a fair return over operating costs.

(b) At present, under court order, the rates being paid by the consumer to the various distributing companies are as follows:

Kansas City, Kansas	$0.60
St. Joseph, Missouri	.60
Weston, Missouri	.60
Atchison, Kansas	.60
Leavenworth, Kansas	.60
Tonganoxie, Kansas	.60
Lawrence, Kansas	.60
Topeka, Kansas	.60
Baldwin, Kansas	.60
Merriam, Kansas	.60
Lenexa, Kansas	.60
Olathe, Kansas	.60
Gardner, Kansas	.60
Edgerton, Kansas	.60
Wellsville, Kansas	.60
Welda, Kansas	.60
Ottawa, Kansas	.60
Princeton, Kansas	.60
Richmond, Kansas	.60
Colony, Kansas	.60
Bronson, Kansas	.60
Moran, Kansas	.60
Fort Scott, Kansas	.60
Deerfield, Missouri	.60
Nevada, Missouri	.60
Thayer, Kansas	.50
Liberty, Kansas	.50
Altamont, Kansas	.50
Oswego, Kansas	.50
Columbus, Kansas	.50
Scammon, Kansas	.50
Cherokee, Kansas	.50
Weir City, Kansas	.50
Pittsburg, Kansas	.50
Galena, Kansas	.50
Carl Junction, Kansas	.50
Oronogo Missouri	.50
Joplin, Missouri	.50
Jasper County, Missouri	.50
Independence, Kansas	.30
Coffeyville, Kansas	.30
Elk City, Kansas	.30
Parsons, Kansas	.35

of which the distributing companies receive 42½ per cent.

The last four named cities are supplied with low pressure gas, which comes largely, if not entirely, from local fields and they do not get any appreciable supply from the main high pressure lines, which accounts for the low rates accorded them by court order.

9. Ownership of the Local Gas Plant.

(a) At present the Kansas City Gas Company is a private corporation, having no financial connection with the Doherty interests. There has been much agitation in favor of having the city purchase the local plant, and the franchise defines the manner in which this may be done. The gas company has expressed its willingness to sell to the city whenever the city takes the necessary action.

(b) *Attitude of the Public.*

At the present time a large number of people of Kansas City are very much opposed to the local gas company, feeling that the company is responsible for the gas shortage. This attitude would interfere to some extent in any effort of the local company to improve conditions. The public interest in the matter has nothing to do with private interest, except that it desires that private capital shall receive a fair return. *That chief public interest is the securing of an adequate supply of gas at a reasonable price.*

(c) *Municipal Ownership of the Local Plant.*

1. *Attitude of the Public.* There is a strong sentiment in the city for the purchase of the gas plant. There is no doubt that if the city should purchase the plant there would be a better spirit manifested by the citizens.

2. *Procedure.* In order to purchase the plant, certain legal procedure would have to be followed by the council. After this a scientific valuation of the property of the gas company should be made as provided in the franchise, in order that the purchase price would be a price which would be fair both to the city and to the company. All of this would take considerable time.

3. *Financing the Purchase or Construction of a Gas Plant by the City.* The present limitation on bond issues

Vain hopes are often like the dreams of those who wake.—Quintillian.

by the city is 5 per cent of the assessed valuation of the year preceding the last collected assessment. That is, the present basis for bond issues is the assessment of 1915. This assessment was $214,000,000. *There are now outstanding or authorized* $9,337,000 *of bonds, and these, together with the* $1,250,000 *water works bonds just voted by the people, will leave only* $113,000 *available.* This amount, is, of course, useless either to purchase the present gas plant or build any additions.

4. *Increasing the Bond Limitation. There has been agitation in Kansas City for some years looking toward a constitutional amendment providing for an increase in the bond limitation.* The two proposed amendments would provide, first, for power to issue bonds to the extent of 20 per cent. of the assessed valuation for the purpose of purchasing or constructing public utilities. These bonds will be a charge against the utilities themselves and their earnings and not an encumbrance of the general bonding power of the city. Second an increase to 10 per cent. of the general limitation on bond issues.

5. *Time Necessary for Municipal Construction Under Present Conditions.* Assuming that a constitutional amendment were passed in November, 1918, providing for an increased bond limitation, and for specific utility bonds as previously outlined, *it would be approximately a year from the present date, or May, 1919, before a bond election could be held and bonds voted.* If the vote were favorable, and it was decided to issue bonds to purchase the local gas plant, it would still be necessary to use natural gas for the next two winters and depend upon the same source for a supply as the local company does, pending the construction of an independent plant for the manufacture of gas. *It is doubtful at this time whether the necessary materials and labor could be obtained to build such a plant even if the funds were available.*

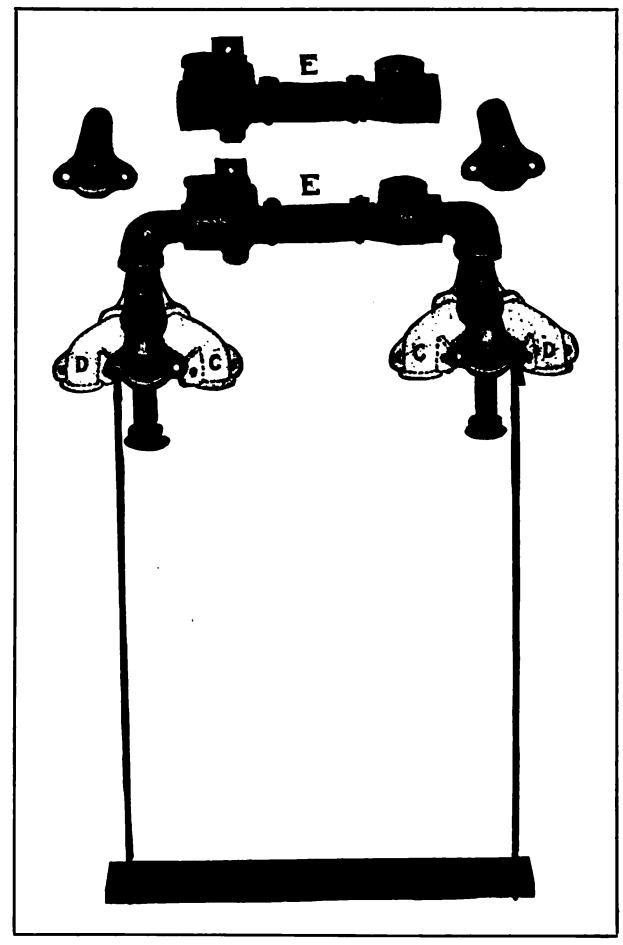
10. *Conclusion.*

The Committee has studied the question from every angle from which any possible light could be secured and presents this report in the hope that its adoption will secure relief from the intolerable conditions which have existed in the past. Each month's delay only adds to legal complications and increases the ultimate cost to the consumers. Had a contract been made eighteen months ago, litigation, which now hampers, delays and adds to cost, would have been terminated or avoided. Extensions would have been made at costs which it is impossible to even consider at this time and the rates to consumers fixed at a lower price than is now possible, because all costs would have been less.

TYING SERVICE AND HOUSE-PIPING TOGETHER.

EVERYTHING that makes for security against the turning of valve at the meter, unless by hand of gas company employe; that which makes for fewest number or variety of connections between service and various sizes of meters, through use of a sliding adjustable connection; that which makes for finish without adding to cost; that which accomplishes the coupling of a special meter-connection with the use of *stock fittings,* and that which provides a substantial and level meter-shelf, connected with and as a part of the meter connection equipment, is worth the attention of every gas manager, and should be known to every meter-shop-man and every meter-shop-foreman.

Our illustration pictures just such a connection, and it will be noted that the supporting rods for the meter shelf are threaded at the lower end, thus the meter may be leveled without difficulty, and if from any cause it should at any time sag, it can be easily re-leveled.



METER SHELF AND CONNECTIONS.

Every meter man and gas manager will recognize at a glance the good features in the appliances we are describing.

Part "E" is the tie-in between the service and the riser, with a meter cock as a part of the connection. "A" shows the four service ells. These are stock fitting—"B" shows the special fittings with lugs for meter hangers—"C" shows the swing for the three-light or iron case meter—"D" shows the swing for 10-light meter, this also gives the necessary swings for three, five or ten-light, or iron case meter without extra piping or changing of the tie-in connection.

The device described prevents leakage through the causes of improper handling, improper setting of meters, washer shrinkage, use of lead pipe. In a word, no strain exists. It is a Lattimer-Stevens device.

Conscience has no more to do with gallantry than it has with politics.—Sheridan.

AROUND THE BELT

New Wells, New Pipe Lines, New Contracts, Additions and Extensions. A Fund of Valuable News Gathered for the Journal Through Many Sources.

TRADE PERSONALS

DRAIS, PHIL, is President of the Solano Oil & Gas Company, recently organized to drill in the Pine Island, Louisiana, field.

FISHER, J. G., formerly Superintendent of the Drumright Division of the Oklahoma Gas & Electric Company, is now in the army, stationed at Camp Pike, Ark.

GRIFFITH, W. E., of the Empire Gas & Fuel Company of Bartlesville, Okla., left recently for Colombia, San Domingo, and other points in South America. The trip is being made in the interests of Mr. Griffith's concern.

LAMPKIN, WALTER L., Federal Fuel Administrator for Kansas City, Mo., is also in charge of natural gas distribution there.

MAPLES, G. C., of the Commercial Department of the Citizens Gas & Fuel Company, Terre Haute, Ind., has severed his connection with the company in order to take up newspaper advertising work.

ORR, CHARLES T., of Fort Smith, Ark., has acquired control of the LeFlore County Gas & Electric Company, Poteau, Okla. Mr. Orr is President of the company.

OWENS, J. F., Vice-President and General Manager of the Oklahoma Gas & Electric Company, rendered excellent service as Chairman of the United War Work Campaign for Oklahoma County, Okla.

SHULTERS, H. V., has resigned from his dual office of Secretary and Treasurer of the East Ohio Gas Company, Cleveland, Ohio, and is now President of the National Bank of Commerce of that city.

TONKIN, JOHN, recently became President of the Central Kentucky Natural Gas Company, Lexington, Ky.

WALKER, W. O., of Oil City, has been elected Vice-President and General Manager of the Central Kentucky Natural Gas Company, Lexington, Ky.

WYER, S. S., Chief of Natural Gas Conservation for the Federal Fuel Administration is investigating conditions surrounding the operation of the Kansas Natural Gas Company, Kansas City, Mo., with a view to formulating recommendations for the prevention of leakage and waste in the system.

DECEASED

DRAKE, LAUREN J., President of the Standard Oil Company of Indiana, died at his home in Chicago, October 10th.

GIFFORD, BENN J., Superintendent of the Little Rock Gas & Fuel Company, Little Rock, Ark., recently passed away at the age of forty-seven years.

TROSCH, SERGEANT F. BRINTON, formerly with the United Natural Gas Company, Oil City, Pa., died of wounds sustained on the battle fields of France.

PER CUBIC FOOT—RATES

KANSAS—Burlington

The following rates have been adopted by the local gas company which is owned by Henry Keiser of Bloomington, Ill.: 40 cents per thousand for domestic use and for gas engines, and 25 cents per thousand for industrial uses.

NEW YORK—Caledonia

The Tri County Natural Gas Company has increased its rates in Caledonia and Scottsville, and the towns of Caledonia, Le Roy, and Wheatland. Rates for gas for fuel lighting or power are increased from 45 to 50 cents per 1,000 cubic feet and a service charge of 50 cents a month will be made against each consumer, regardless of the amount of gas consumed, and will not be absorbed in the charge for gas used except in Le Roy. The charge will be absorbed where 5,000 cubic feet or more are used in a month. No service charge has been required before. The prompt payment discount is discontinued.

OHIO—East Liverpool

A new schedule of gas rates has been filed by the People's Natural Gas Company in which the rates for gas used for domestic purposes and for Class II consumers (gas engines, etc.), has been increased to 37 cents per thousand cubic feet, less a discount of two cents per thousand cubic feet. The rate for Class 14, churches and charitable institutions is increased to 32 cents.

Mansfield

The Logan Natural Gas & Fuel Company has increased its rates beginning with November 1st.

OKLAHOMA—Ada

The Macthwaite Oil & Gas Company has filed a petition with the Public Service Commission asking permission to increase its gas rates from 25 cents to 35 cents per thousand.

Tulsa

The new rates made effective here by the Oklahoma Natural Gas Company represent an increase of 6½ cents per thousand. The minimum charge is 25 cents per month.

Better be ignorant of a matter than half know it.—Syrus.

PENNSYLVANIA—Fayette County

The Greensboro Gas Company has advanced its rates from 30 to 35 cents per thousand in Green, Washington and Westmoreland Counties, as well as in Fayette County.

Pittsburgh

The Peoples Natural Gas Company has filed with the Public Service Commission of Pennsylvania a schedule of increased rates in Altoona, Cresson, Juniata, Loretta, Portage, Sankertown, Summit and villages served east of New Florence. Class 1, domestic consumption, increased from 37 cents to 42 cents per thousand feet with 2 cents per thousand feet discount. Class 2, special consumers, using gas in quantities to exceed 300,000 feet per day and who cannot readily substitute another fuel, will pay the same rate as Class 1. Class 4, churches and charitable institutions, will have their rate increased from 31 to 37 cents with the customary discount.

WEST VIRGINIA—Fairmont

An increase to 27 cents for domestic use, and 25 cents for industrial use has been made effective in the rates charged by the Monongahela Valley Traction Company.

INCORPORATED

DELAWARE—Wilmington

The Regoo Oil & Gas Company was recently chartered under the laws of this State by E. E. Aberlee, George G. Steigler, J. H. Dowdell. The concern has a capital of $100,000.

GEORGIA—Atlanta

The Georgia Welding Company has been incorporated with a capital stock of $100,000. Elmer Oliver and C. E. Gregory are among those interested.

INDIANA—Terre Haute

The Rosedale Oil & Gas Company has been formed with a capital of $50,000. The directors in the new concern are: Ezra R. Baldridge, Oliver P. Bell, Daniel V. Miller, Jerome F. Shandy.

Terre Haute

The Consumers' Oil & Gas Company of Indiana has been organized here with a capital stock of $50,000. The directors named are: William R. White, William D. Hunter, John H. Gallagher, Hugh Whitney and William E. Eppem.

KENTUCKY—Caney

The Cromer Oil, Gas, Drilling & Refining Company has been chartered with a capital stock of $75,000.

LOUISIANA—Pine Island

The Solano Oil & Gas Company has been organized with a capital stock of $60,000 to drill in this field. The officers are: Phil Drais, president; J. L. Kimball, vice-president; and John Woodley, secretary-treasurer.

OHIO—Mansfield

The incorporation here of the Eclipse Stove Company with a capital of $300,000 is reported. Paul R. Tapan is among those interested.

TEXAS—Austin

The Eastland Gas Company has been incorporated by J. J. Potts, F. E. Maxwell, and J. Leroy Arnold with a capital of $90,000.

ITEMS OF FINANCE

MISSOURI—Kansas City

The Bates County Oil & Gas Company has increased its capital from $50,000 to $150,000.

NEW YORK—New York City

The recently issued report of the Columbia Gas & Electric Company and its subsidiaries, shows for the month of September gross earnings of $835,824, increase $103,097; total net income $546,078, increase $51,195; surplus after charges $186,560, increase $40,268; nine months' gross $8,496,800, increase $614,058; total net income $5,724,681, increase $271,673; surplus after charges $2,511,348, increase $109,384.

OHIO—Cincinnati

The franchise tax on the gross earnings of the Union Gas & Electric Company for the three months ending September, amounted to $652,124.30. A check for this amount was tendered to the city auditor by the company. The franchise tax for the corresponding period in 1917 was $50,000 less.

GENERAL

DISTRICT OF COLUMBIA—Washington

The United States Fuel Administration is establishing a course of instruction in natural gas conservation for the school children living in territory where natural gas is produced and used. It is said that Ohio and Kentucky will be among the first States to introduce the course in their schools.

Washington

An order has been issued by the Fuel Administration to mayors of towns in Pennsylvania and New York where natural gas is used, requesting that they co-operate in the conservation of natural gas, of which there is now a definite shortage.

INDIANA—Shelbyville

The Citizens Gas Company of this city, acting under a permit from the Indiana Public Service Commission, has sold its pipe-lines leading from this city to the gas fields in Hancock County and the north part of Shelby County, to Louis Friedman of Muncie. The company will receive approximately $120,000 for forty-eight

Cheer up and the atmosphere will clear up. Blues fade in the sunlight.—Herbert Kaufman.

miles of pipe-lines. It is understood that the service of natural gas to this city, which is supplied entirely by the Citizens Company, will be discontinued.

Union City

The Bastrop Gas Company has been organized under the laws of this State, with a capital stock of $60,000. Judge Theodore Shockney, C. Walter Hiatt, Don P. Shockney, Charles W. Eastman, Nellie Wall and Bert Woodbury are named as directors. The company expects to distribute gas in the State of Louisiana.

KENTUCKY—Barren County

The Kirby Oil & Gas Company, recently organized, has secured leases on a large acreage in this county, and will at once begin development work. It is said that the first test will be drilled near the Willoughby well on the Carter lease, near the Allen County line. C. A. Phelps is half owner of the new company.

Louisville

An order, effective November 15, 1918, restricting the use of natural gas in the city of Louisville, Ky., to not exceed 1,000 cubic feet per day for each consumer, until further notcie, was issued recently by the United States Fuel Administration. This step was taken, it is declared in the statement which accompanied the order, because there is not now, nor will there be during the coming winter, sufficient natural gas available to meet the demand unless such an order is put into effect. The limit may be changed from time to time as its practical working is determined, and the weather conditions and supply may permit.

There is no way of immediately increasng tihe supply of natural gas unless it is rationed in West Virginia, the point of production, it is declared, and this could not be done without interfering with prior rights of other companies and communities.

The rationing limit of 1,000 cubic feet a day per consumer, could be safely raised to 2,500 feet a day, the statement says, if the Louisville Gas & Electric Company were permitted to manufacture a limited quantity of artificial gas and distribute this during periods of unusual demand in cold weather. The company has expressed its willingness to furnish the artificial gas at actual cost of manufacture, and the Fuel Administration believes this added expense might properly be apportioned among those consuming in excess of 1,000 cubic feet a day, and that the value of a mixture of natural and artificial gases would not be appreciably different from natural gas.

Paintsville

The Bed Rock Oil & Gas Company recently completed a good gasser on the Boyd Conley farm on Tick Lick.

LOUISIANA—Shreveport

The Old Farms Oil Company in No. 2 Noel, Section 25-21-15, drilled in 8,000,000 feet of dry gas at a depth of 2,260 feet.

The Red Banks Oil Company's No. 3 Herold, in Section 35-21-15, which at 2,240 feet was making 1,500,000 feet of gas, has increased to 10,000,000 feet and will probably be used for fuel for drilling operations in the Pine Island district.

The Greer Oil Company got a small gas well with a rock pressure of 40 pounds in their test on the Bobb Barr lease, in Section 28-22-15, between the Pine Island and Hosston districts, at 900 feet, but will drill deeper for oil.

MISSOURI—Kansas City

The distribution of natural gas in this city is now under the supervision of Walter L. Lampkin, Federal Fuel Adminsitrator. Rules looking to the conservation of gas in every way possible, and to the obtaining of the best results from the available supply have been formulated.

In enforcing the rules, Mr. Lampkin may order different commercial gas users to run their plants at night instead of during the day when the call for domestic gas is greatest. He plans to see that the housewfie has the first call upon the gas supply for cooking, and before commercial users are supplied with gas the storage tank of the company must be filled at night during the winter in order that gas will be available for breakfast in the mornings. Also, the tank must be filled for cooking the evening meal.

NEW YORK—Batavia

The Common Council of Batavia has rescinded the franchise it gave to the Republic Light, Heat & Power Company of New York on August 21st, to furnish by-product gas for Batavia. It is learned the Council had no authority without first getting the approval of the people through a referendum vote.

Cowlesville

The Iroquois Gas Company, it is reported, has drilled in a well estimated to have a production of 500,000 cubic feet, on the North farm, three miles southeast of this village, at a depth of 1,800 feet.

Jamestown

The National Fuel Administration has taken over matters in connection with the distribution of natural gas in this city. It is said that the gas will be furnished for power purposes only after consumers of every other type have been supplied.

Williamsville

Martin Scheeler, president of the Buffalo Wire Works Company, whose Sunset Farm is located on North Forest Road, three miles north of Williamsville, has a high pressure gas well on his farm. The gas was struck 712 feet below the surface. There will be a good supply for use on the farm and to light up the road.

OHIO—Cleveland

Glenn L. Martin, of this city, has equipped his automobile with a big bag of natural gas which is connected with the carburetor. The bag is fitted on the top of the car. The engine runs on natural gas instead of gasoline.

Hocking County

In the deep territory in Starr Township, the Ewing Oil Company has completed in the Clinton sand a test on the White-Hengst farm. It is a gasser.

Actions, words, looks, steps, form the alphabet by which you may spell character.—Lavater.

Sandusky

The Libbey Glass Company is installing three machines for the production of gasoline gas in order to keep the factory running at times when the natural gas supply is shut off.

The Sandusky Gas & Electric Company which has been distributing natural gas sold to it by the Logan Gas Company, will discontinue this service due to the failure in natural gas at the wells. It is reported that the company is preparing plans to construct a large artificial gas plant which will assure a reliable and continuous supply of gas at all times. The actual commencement of the erection of such a plant is awaiting action by the authorities at Sandusky on an artificial gas rate. It is expected this will be taken soon, so that the new plants will be ready to serve when the natural gas supply is discontinued.

OKLAHOMA—Bartlesville

According to the report for the year ended June 30th, 1918, issued recently by the Empire Gas & Fuel Company, oil production amounted to 14,55,000 barrels of crude oil, an average of approximately 40,000 barrels a day for the twelve months period. Net earnings were $19,322,029. In the last few months the Empire Gas & Fuel Company has extended its development in the Butler County, Kas., field, and the present daily production is in excess of 60,000 barrels of crude oil while through subsidiaries the company is producing and marketing more than 100,000,000 cubic feet of natural gas daily.

Bartlesville

Two miles of the 8-inch line at Pawhuska in the system of the Empire Gas & Fuel Company are being taken up and relaid to well No. 51 of the American Pipeline Company. A new line is being constructed by the company for the Kansas Natural Gas Company west of Avant, connecting with the main line in the Cushing field.

The young women of the Empire Gas & Fuel Company have formed a golf club, and every encouragement is given them to become interested in the game and to play often, on account of the splendid exercise it furnishes.

Blackwell

According to those who have been engaged in development work in this field for a long period, seventeen gas sands are known to exist in this section. They are found at the following depths: 40, 135, 205, 290, 330, 645, 725, 800, 1,000, 1,600, 1,800, 2,000, 2,200, 2,700; 3,000, 3,400 feet. The most prolific formation is at 2,700 feet, but the strongest rock pressure is obtained in the sand at 3,400 feet.

Creek County

The Cosden Oil & Gas Company drilled in a 6,000,000-foot gasser in its test on the Newton farm in Section 26-17-11 in sand at 1745-85 feet.

It is reported that Joe Abraham's No. 1 on the Brsicoe land in Section 2-15-9, is good for 3,000,000 feet of gas from sand at 2,519 to 2,527 feet.

C. B. Shaffer and others' No. 8 Wacoche, in Section 29-18-7, is a 2,000,000-foot gasser.

Drumright

The Oklahoma Gas & Electric Company has put women at work in reading meters and in other work heretofore done by men. Other substitutions of women for men are likely to be made later, it is stated.

Garber

The Roranna Petroleum Company is cleaning out No. 4, Schroeder, in the northwest corner of the southwest of the northwest quarter of Section 18-22-3 west, which is a 7,000,000-foot gas well at 1,960 feet.

Cosden & Marland's No. 8, Walker, in the southast corner of Section 13-22-4, is good for 2,000,000 feet of gas from sand at 1,200 to 1,205 feet.

Kay County

The Empire Gas & Fuel Company has a 6,000,000-cubic foot gasser in its No. 7 on the Harvel farm in Section 6-28-1 east, in sand at 2,185 to 2,209 feet.

Oklahoma City

It is reported that the Oklahoma Natural Gas Company has begun the construction of its line from this city to a gas connection in the southern fields of the State. The carrying out of the project will entail an expenditure of about $2,000,000.

The new connection probably will be centered in the Walters field, and laterals will be extended to the Fox and Cenment fields, the former being on the east and the latter west and north of the Walters field, and nearer Chickasha. These branch supply lines will be connected with the main line which will bring the gas to Oklahoma City.

E. J. Lambert's No. 1, Johnson, in Section 30-13-12, is a 1,000,000-foot gasser in sand at 1,947-74 feet.

The Iowa Oil & Gas Company has drilled in a 35,000,000 cubic foot gasser in Section 17-13-12. This is the second good gasser completed within a short period in this field.

The Mince Oil Company's No. 1, Johnson, in the northeast corner of the soutwest quarter of Section 7-13-12 drilled into a gas sand at 1,890 to 1,925 feet and the well is good for 20,000,000 feet.

The Texas Company has an 8,000,000-foot gasser in No. 1, Young, in the southwest corner of the northeast quarter of Section 7-12-12 from sand at 1,911 to 1,930 feet.

Bradstreet and others have a 7,000,000-foot gasser, No. 4, on the Hardridge farm, in Section 14-13-12. The gas comes from sand at 2,135-45 feet.

Osage

The Kingwood Oil Company has drilled in a gasser in No. 2 on the Beaver farm in Section 4-10-12, which is reported to be good for 3,000,000 feet. The gas came in at a depth of 1,000 feet.

The Lewcinda Oil Company and Phillips Petroleum Company, drilled into a 22,500,000-foot gas production

The essence of good and evil is a certain disposition of the will.—Epictetus.

in sand at 1,707-50 feet in the southwest quarter of Section 3-26-11.

The Hazlitt Oil Company has a 6,000,000 cubic foot gasser in its No. 1 in Section 21-23-11.

The Mid-Co. Petroleum Company's No. 14 in Section 10-27-10 is a 1,500,000-foot gas well in sand at 1,965-83 feet.

The Sperry Oil & Gas Company has a 1,000,000-foot gasser in the center of the north line of the northwest quarter of Section 14-27-10, in sand at 1,971-2,150 feet.

Pawnee County

The No. 1 Oil Company's test on the McIntire farm, in Section 13-21-7, is a 5,000,000-foot gasser from sand at 2,330 to 2,392 feet.

Payne County

In the Yale District, the Middle States Oil Company's No. 1 on the Ellis farm, in Section 36-19-5 drilled into an 8,000,000-foot gas production at 2,006-30 feet.

Rogers County

The Chenango Oil & Gas Company's first well on the Rhodes farm in Section 27-21-14, is a 3,000,000-foot gasser in sand at 1,163-75 feet.

In the Muskogee District the Greenwood Gas Company's No. 3 on the Taylor farm, Section 28-15-17 is a 1,000,000-foot gasser in sand at 1,238-49 feet.

Stephens County

Smith and others' No. 1, Isherwood, in the southeast corner of Section 11-2n-5w, an old gas well drilled a little deeper, shows a capacity of 26,000,000 feet a day. It is five feet in sand found at 1,420 feet.

The Empire Gas & Fuel Company has a gas well three feet in the sand found at 1,720 feet in No. 1 on the Colbert farm, in Section 19-1n-5w. The well is good for 8,000,000 feet of gas.

Tiger Flats

The Texas Company has a 5,000,000-foot gas well in the 1,620-foot sand in Section 34-15-11 on the M. Coleman farm.

Tulsa County

Loffland & Burgon's No. 2 Couch, in Section 28-16-13, Bixby District, is good for 4,500,000 feet of gas in sand at 1,420 to 1,450 feet.

Wann

The Prairie Pipe Line Company, it is said, is completing plans to extend its pipe line to the Forman field. The report further states that the company will install an oil pumping station.

PENNSYLVANIA

Shortage in the supply of natural gas available to the Potter Gas Company which furnishes natural gas to some 17,000 domestic consumers in thirty-five towns and villages in McKean, Potter and Tioga counties, Pennsylvania, and to a number of gas companies serving local communities in New York State has caused the Fuel Administration to issue an order, effective November 11, 1918, restricting domestic consumers so served in Pennsylvania to 24,000 cubic feet per month, and those in New York State to 12,000 cubic feet per month.

The difference in the limits fixed for consumers in the two States is due to the fact that the Pennsylvania consumers served by the Potter Gas Company have always had an adequate supply of natural gas and are not generally provided with appliances for using substitute fuel, and to the further fact that no provision has been made to supply the Pennsylvania communities with coal; while in New York State the supply of natural gas to the consumers affected has never been adequate, and they are therefore equipped to use substitute fuel. Furthermore, the Fuel Administration has supplied the New York communities with coal. Provision is made in exceptional cases where substitute fuel is not available, for the State Administrator to issue a permit for the use of an additional quantity of natural gas.

The Potter Gas Company supplies in addition to the domestic consumers in Pennsylvania and New York, the Crystal Gas Company, which serves the city of Corning, N. Y.; the Addison Gas & Power Company, serving the town of Addison, N. Y., and the Elmira Water, Light & Railroad Company, which distributes natural gas to the city of Elmira, N. Y. Consumers supplied by these companies are likewise re-

stricted to 12,000 cubic feet per month.

The statement which accompanies the order recites that the amount of natural gas available for delivery from approximately 700 producing gas wells, does not exceed 7,500,000 cubic feet per day, and that the flow of gas which is constantly declining cannot be increased by any reasonable expenditure.

WEST VIRGINIA—Brooke County

The Rockledge Oil Company has drilled in its test on the W. Kirchner farm, and it is a good gasser.

WYOMING—Rawlins

The Producers' & Refiners' Corporation has completed an oil well of large production capacity on the Ferris dome, thirty-five miles northeast of this city.

INDEX OF PAST 1918 ISSUES—Continued

MEMBERS OF ASSOCIATION OF NATURAL GAS SUPPLY MEN

DAVID O. HOLBROOK, President, Oliver Building, Pittsburgh.

LARMOUR ADAMS, Secretary, 1304 First National Bank Building, Pittsburgh.

Ajax Iron Works, Corry, Pa.
Allegheny Steel Co., Pittsburgh.
Anchor Packing Co., Pittsburgh.

Bessemer Gas Engine Co., Grove City.
Blodgett Co., Inc., The G. S. Burlington, Vt.
Borden Company, Warren, Ohio.
Bovaird & Seyfang Mfg. Co., Bradford, Pa.
Bristol Co., The, Waterbury, Conn.
Broderick & Bascom Rope Co., St. Louis.
Bryant Heater & Mfg. Co., Cleveland.
Buffalo Co-operative Stove Co., Buffalo.
Builders Iron Fdy., Providence.
Byers, A. M. Co., Pittsburgh.

Carnegie Steel Co., Pittsburgh.
Chaplin-Fulton Mfg. Co., Pittsburgh.
Cincinnati Rubber Mfg. Co., Cincinnati.
Clark & Norton Mfg. Co., Wellsville, N. Y.
Cleveland Gas Meter Co., Cleveland.
Colona Mfg. Co., Pittsburgh.
Columbia Gas Stove Co., Huntington, W.Va.
Columbian Rope Co., Auburn, N. Y.
Columbus H't'g & Vent'g Co., Columbus.
Continental Supply Co., St. Louis.
Cooper, C. & G Co., Mt. Vernon, O.
Crandall-Pettee Co., New York City.
Cutler Hammer Mfg. Co., The Milwaukee.

Davis-Bournonville Co., Jersey City.
Dayton Pipe Coupling Co., Dayton.
Davison, N. C., Gas Burner & Weld'g Co., Pittsburgh.
Domestic Engineering Co., Dayton, O.
Draeger Oxygen Apparatus Co., Pittsburgh.
Dresser, S. R., Mfg. Co., Bradford, Pa.

Equitable Meter Co., Pittsburgh.
Estate Stove Co., Hamilton, O.

Fitler, Edwin H. Co., Philadelphia, Pa.
Foxboro Co. The, Foxboro, Mass.
Franklin Co. The, Canton, O.
Frick & Lindsay Co., Pittsburgh.
Fuel Oil Journal, Houston, Texas.

Garlock Packing Co., Palmyra, N. Y.
Gas Age, The, New York City.
Gas Appliance Co., Cleveland.
Gas Record, Chicago.
General Fire Ext'g'r Co., Providence.
General Gas Light Co., Kalamazoo.
Germer Stove Co., Erie.
Gilfillan Machine Works, Ebenezer, N. Y.
Goodrich, B. F. Co., Akron, O.
Graves Supply Co., Cincinnati.
Guardian Gas Appliance Co., The, Cleveland, Ohio.
Gwynn Gas Burner & Eng. Co., Pittsburgh.

Hammon Coupler Co., Pittsburgh.
Haymond Co., Muncie, Ind.
Hays Mfg. Co., Erie.
Hart Mfg. Co., Cleveland.
Hazard Mfg. Co., Chicago.
Heeter, C. M. Sons & Co., Inc., Butler, Pa.
Hewitt Rubber Co., Pittsburgh.
Hooven, Owens, Rentschler Co. Hamilton O.
Hope Engineering & Supply Co. Pittsburgh.

Ideal Heating Co., The, Columbus.
Imperial Belting Co., Chicago, Ill.
Ingersoll-Rand Co., Pittsburgh.
International Hale Gas Mixer Company, Providence.
Iroquois Natural Gas Co., Buffalo, N. Y.

Jarecki Mfg. Co., Erie.
Jiffy Water Heater Co., St. Louis.
Jones & Laughlin Steel Co., Pittsburg, Pa.

LaBelle Iron Works, Steubenville, O.
Lattimer-Stevens Co., Columbus, Ohio.
Leschen, A. & Sons Rope Co., St. Louis.
Lezius Automatic Draft Reg. Co., Cleveland.
Lucey Mfg. Corp., Pittsburgh.
Ludlow Valve Mfg. Co., Pittsburgh.

Macomber & Whyte Rope Co., Chicago.
Manhattan Rubber Mfg. Co., Passaic, N. J.
Mark Mfg. Co., Chicago.
Maxon Premix Burner Co., Muncie, Ind.
Meek Oven Mfg. Co., Newburyport, Mass.
Metric Metal Works, Erie.
Minneapolis Heat Reg. Co., Minneapolis.
Modern Iron Wks., Quincy, Ill.
Modern Safety Iron Co., Philadelphia.
Moon Mfg. Co., The, Chicago.
Moore, Lee C. & Co., Inc., Pittsburgh.
Moser Mfg. Co., Kane, Pa.
Mueller H. Mfg. Co., Decatur, Ill.

Nathan Mfg. Co., New York City.
National Supply Co., Pittsburgh.
National Transit Pump & Mach. Co., Oil City, Pa.
National Tube Co., Pittsburgh.
Natural Gas & Gasoline Journal, Buffalo.
New Bedford Cordage Co., New York City.
New York Belt'g & Pack'g Co., New York.
Nye, A. T. & Son Co., Marietta, O.

Oil & Gas Journal, Tulsa, Okla.
Oil City Boiler Wks., Oil City, Pa.
Oil Trade Journal, New York.
Oil Well Supply Co., Pittsburgh.
Oxweld Acetylene Co., Chicago.
Parkersburg Mach. Co., Parkersburg, W.Va.
Parkersburg Rig & Reel Co., Parkersburg, W. Va.
Peerless Heater Co., Pittsburgh.
Pennsylvania Furnace & Stove Co., Warren, Pa.
Pittsburg Meter Co., East Pittsburg.
Pittsburg Reinforced Brazing & Mach. Co., Pittsburgh.
Pittsburg Valve & Fittings Co., Pittsburgh.
Pittsburg Valve, F'd'y & Const. Co., Pittsburgh.
Pittsburgh Water Htr. Co., Pittsburgh.
Plymouth Cordage Co., N. Plymouth, Mass.
Pratt & Cady Co., Inc., New York City.
Prichard Supply Co., Mannington, W. Va.

Rathbun-Jones Eng. Co., Toledo.
Reid, Jos. Gas Engine Co., Oil City, Pa.
Reliable Stove Co., Cleveland.
Republic Iron & Steel Co., Youngstown, O.
Revere Rubber Co., Chelsea, Mass.
Reznor Mfg. Co., Ltd., Mercer, Pa.
Riesenman Mfg. Co., Ltd., Franklin, Pa.
Robinson, J. E. & Co., Oil City, Pa.
Robinson Packer & Mach. Co., Coffeyville, Kansas.
Roebling, John A. Sons Co., Trenton, N. J.
Rossendale-Reddaway Belt'g & Hose Co., Newark, N. J.
Ruud Mfg. Co., Pittsburgh.

Sanitary Co. of America, Linfield, Pa.
Schaeffer & Budenberg Mfg. Co., Pittsburgh.
Scientific Heater Co., The, Cleveland, Ohio.
Selas Co., Canton, O.
Solar Light Co., New York City.
South Chester Tube, Chester, Pa.
Spang, Chalfant & Co., Pittsburgh.
Sprague Meter Co., Bridgeport, Conn.
Strause Gas Iron Co., Philadelphia.
Superior Gas Engine Co., Springfield, O.

Tate-Jones & Co., Inc., Pittsburgh.
Taylor, W. P. Co., Buffalo.
Toledo Pipe Thr'd'g Mach. Co., Toledo, O.
Troop Mfg. Co., Pittsburgh.

United Seal Co., Columbus.
Utica Valve & Fixture Co., Utica, N. Y.

Welsbach Co., Gloucester City, N. J.
Westinghouse Mach. Co., Pittsburgh.
Westinghouse Electric & Mfg. Co., Pittsburgh.
Wheeling Steel & Iron Co., Wheeling.
Wolfe, Linden W., Oil City, Pa.
Worthington Pump & Mach. Corp., Buffalo.
Wright Wire Co., Worcester, Mass.

Youngstown Sheet & Tube Co., Youngstown, O.

MANUFACTURERS' AFTER-WAR MEASURE.

The Natural Gas and Gasoline Journal is a Magazine That Will, as is Said of Gibson's Magazine in Another Field,

Build Good-will.
Increase Your Sales.
Increase Your Profits.
Make Business Friends.
Get Your Message Across.
Keep Your Catalogue Alive.
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Make Well Known in Your Field.
Create Preference in Buying.
Take the Place of Circulars.
Educate Against Price Buying.
Decrease Your Selling Expense.
Educate Buyers to Better Your Goods.
Provide an Automatic Follow-up.
Get Individual Names of Buyers.
Work Between Your Salesmen's Calls.
Automatically Build Up a Live Mailing List.
Develop Confidence of Buyers in Your Company.
Get Better Attention for Your Correspondence.
Insure Your Messages Against the Waste Basket.
Link Up Dealers with Your National Advertising.
Enable Your Salesmen to Gain Audiences More Easily.

We offer the foregoing for the thoughtful consideration of manufacturers of equipment, supplies, and appliances in the gas-field of the United States.

Now is not the time for disappearing—now is the time for holding one's trade, and opening negotiations for the making of future customers.

The old saying, "In time of peace prepare for war," was the German policy. Let ours be, "Since peace is here, let's build for commercial development."

Buying, we all know, during the war was curtailed, and the purchases made were in smaller volume than formerly. It was a time of *buying-as-needed*. The way for the manufacturer to hold and to make customers now that the war is over, is to use the publicity mediums of the field, thus preparing the way for, and supplementing the work of sales-representatives.

Regular publicity, setting before the industry the statements and arguments of the manufacturer, is the soundest and best means of preparing for industrial development.

Lucius S. Bigelow

FROM THE EDITORIAL MAIL BAG

RELATIVE FUELS-COST.

By LUCIUS S. BIGELOW.

IT will be interesting to all gas interests to note results of tests made with Natural Gas by the Ohio State University based upon that gas at $1.00 per 1,000 cu. ft., *under one to two ounce pressure with properly directed short flames,* as compared with other fuels; also as compared with natural gas at *four to five ounce pressure and long flames.*

In the test the following articles were cooked: Steak, escalloped potatoes, spinach, etc., in preparing portions for six people. The costs were as follows, taking natural gas at $1.00 per thousand, soft coal at $6.50 per ton; delivered in the house, gasoline at 27 cents per gallon, coal oil at 15 cents per gallon, electricity at 3 cents per K. w. h.

Natural gas (one to two ounce pressure, properly directed short flames) 1.1 cent; natural gas (four to five ounce pressure, long flames) 2.2 cents; soft coal 2.5 cents; gasoline 4.6 cents; electricity 5 cents; coal oil 5.4 cents.

This test being one especially planned for the guidance of those using natural gas, no test was made with artificial gas, although an artificial gas range tested with natural gas at low pressure, side by side with a natural gas range, showed that the height of burners, size of orifice, and low pressure, in the artificial range gave far better results, and proved decidedly more efficient, than the natural gas range, constructed as natural gas ranges have been for high pressure service.

This test shows the great possibilities in natural gas at $1.00 pr. 1000 cubic feet, under one to two ounce pressure, with properly directly short flames, when a meal for six persons was prepared with the viands named above, including rice pudding and coffee, at 1.1 cents, we have yet far to go however to prepare for the future in the natural gas situation.

It is believed by many gas-men that a mixing of artificial gas having somewhere in the neighborhood of 520 B.t.u's. and natural gas having approximately 1000 B.t.u's. and serving such gas to gas-appliances under one to two ounces pressure with properly directed short flames, will help greatly to meet the needs arising from a diminishing supply of natural gas, and render most acceptable and reasonable service to customers, even though at a price per 1,000 cubic feet very decidedly above that which is at present generally charged for natural gas when used without mixing wastefully under high pressure, etc.

The public has based its idea regarding fairness of price largely upon what it has been charged in the past respectively for artificial gas, or natural gas, giving practically no consideration to the wonderful efficiency in natural gas if properly used, or to its convenience or present cost to produce and deliver.

The problem now before gas interests is how to educate the public to a proper understanding of the situation, and thereby establish in the mind of the public, a basis for rate-making which shall embody not only the general efficiency and convenience of gas, and its cost to the producer and distributor, but especially what may be accomplished with gas if economically and properly used by the consumer, and what is the cooking-cost of gas.

The days of arbitrary mean on the part of the utilities corporation have passed, or are rapidly passing. The days of wastefulness on the part of the public, which is to no small degree responsible for the rapidly diminishing supply of gas and because of wastefulness and consequent apparently high cost of the fuel, a stumbling block in the way of rate-making, should see an end.

These matters should be put upon the basis of community interests, consideration being due alike to both buyer and seller,—the "social," but not socialistic principle. And by the way, that the two may not be confounded, when we talk of such matters, let us more generally use the expression community-service, rather than socialistic principle, as the outlook for the future.

It is not just, nor is it the principle of community-service that gas interests should have to stand for the prodigal wastefulness of families in their use of gas, yet they are forced to, since the results of such waste tend toward causing the consumer to feel that he cannot pay what in reality is a just price to the producer, because, though he will not acknowledge it, this wastefulness runs his bills well up.

If, on the other hand, the consumer would eliminate this prodigal wastefulness, the cost to him of the gas he would *then* consume (at the higher and fairer rate) would in the gross amount to no more, and both he and the producer would each have accomplished his aim and object, namely, a fairer income to the producer and little if any increase in cost to the consumer.

It would seem to us that "wastefulness" is the great gulf that divides the producer and the consumer. Eliminate this wastefulness on the consumer's part, and allow advances in price of the commodity, and we are sure both the producer and the consumer would be eminently satisfied.

Since it has been proven that a meal, such as we have described may be cooked at a cost of 1.1 cent for six persons, with natural gas at $1.00 per thousand, *properly used,* it is surely up to the public in these days of conserving natural resources, to prepare its meals accordingly, using only scientifically designed appliances, and itself exercising a full measure of thoughtful care to prevent waste.

Even $1.00 per thousand feet for natural gas, we are convinced, will not be looked upon as unreasonable by the public itself when with proper care, its gas-cooked meals cost approximately but 1.1 cent for six persons for the gas used.

Great men often rejoice at crosses of fortune, just as brave soldiers do at wars.—Seneca.

When the public demands a reduction in artificial gas rates, or objects to an advance in natural gas rates, it usually does so as "a measure," with nothing more than a general idea that in the one case it should not pay as much as formerly, even though other commodities have advanced in price, while in the other instance it believes that it should pay no more than formerly.

As we said, the public's stand is generally based upon what it formerly paid, or dreams it should pay, not upon what has been proven may be accomplished with a thousand feet of gas, and thus what the results-cost may be. Nor does the public consider how few are the annoyances and inconveniences with gas, as compared with the use of coal, nor what may be the cost of the gas to the producer and distributor, plus his maintenance cost.

Of late, coal has cost the consumer in certain cities $10.00 a ton, where formerly it cost $6.00 or $6.50, yet we heard almost no complaining on the part of the public, notwithstanding the fact that along with that high cost of coal, came all of the annoyances surrounding its use, such as building of fires, smoke, the waiting for a proper heat, the carrying of coal, the emptying of ashes, the dust of ashes, the clinkering of a fire, the continuing of a burning-out fire, consuming fuel after the need for fire had ended.

The public had become so extravagant, so wasteful, so prodigal in its use of gas, as to cause the National administration not long since to establish a department of Natural Gas Conservation in connection with the Fuel Administration, placing Mr. S. S. Wyer in charge as Chief. This department is putting its research work into practical form for a national campaign whereby to educate the people of the United States to a better knowledge of what a thousand cubic feet of natural gas, that wizard of the earth, will do, if properly and economically used.

It would seem quite in keeping with this line of work taken up by the Administration, that like efficiency measures should be developed in a national form covering the use of, and eliminating the waste of, artificial gas. Were this done, the measure would eventually play a large part in reconciling the two elements, the gas producer and the consumer, after almost precisely the same manner as it is expected will result from the national campaign now well under way to educate the public in ways to conserve natural gas.

The world has passed through the melting pot; many of us have learned how to economize, and how economies may be accomplished even without distress to ourselves. Now, then, with the close of the war we are ready to start upon a new era, an era of continuing economies and conservation. It should be an era of charge based upon *results, proper use, and cost,* rather than what one guesses the price should be, or what one would arbitrarily try to make it.

The work the government is doing through its division of natural gas conservation is a decided step in the right direction. It should take the same step in connection with how to use coal, how to use electricity, and how to use artificial gas.

One might off-hand ask, "Will it be possible for a department of the government at Washington to make the housewives of the United States appreciative of how they may produce better results in cooking, save gas and coal for future generations and pay a fair price, through a clear understanding of the proper way to use gas, to time the cooking of various articles when preparing a meal, etc.?"

The solution is not a difficult one. First: Comprehensive tests by the department. Second: Conveying not only statistics of tests, but the ways and means whereby the tests were accomplished, to the cooking departments in the various educational institutions in the United States, to mothers' clubs, to women's associations, etc., etc., thereby to officially reach the individual housewife, conveying through these channels a knowledge not theoretical, but practical, of how to get cooking-results with the least possible consumption of fuel, be it artificial gas, natural gas, or coal.

The government has recently established an educational bureau at Washington. It is doing a wonderful work, largely based upon the community idea. This department is already conducting free educational schools, and it is quite likely that national, rather than state conduct of schools and education will become the accepted method in the not far distant future.

This will bring the national government into the closest possible touch with the educational institutions of the United States, and why should not this channel already established, work hand-in-glove as a means of conveying to the people of the United States the results of tests, experiments, and discoveries of the department of conservation, covering in its research, natural gas, artificial gas, coal, etc., thus to aid in forming a new basis for arriving at fuel prices? The war has put things in motion in this direction. Let's keep the ball rolling.

MEETING ON NATURAL GAS SITUATION.

TO consider the natural gas situation in the mid-continent gas field, the United States Fuel Administration called a meeting of the Fuel Administrators for Kansas, Missouri, Oklahoma, Arkansas and Texas; representatives of the cities served from that field, and the leading natural gas companies concerned, on November 25th, at Kansas City, Mo. The Fuel Administration was also represented by officials from Washington.

The conference was held at the office of the District representative of the Fuel Administration, Harry N. Taylor, in Kansas City. The question of diverting natural gas from the Oklahoma field, to sections inadequately served, and other important matters affecting the distribution of gas in the mid-continent field were discussed.

A MOTHER'S BLESSING.

THE Hayes Manufacturing Company of Erie, Pa., has made itself the source from which many in the industry have received a beautiful colored print of the picture that has attracted so much favorable comment, entitled, "A Mother's Blessing." The figures in the picture are the mother, the soldier son, and the faithful collie, the soldier's boyhood companion. The work is a beautiful one, both in sentiment and execution.

All truth undone becomes unreal.—Robertson.

Boiler Installation

A Gas-Fired Installation That Is Giving Efficient Service in Pittsburgh

BY J. C. HOBBS.
Duquesene Light Company, Pittsburgh.

BEFORE entering into a detailed description of the installation and giving you the performance records, it is perhaps best to acquaint you with the service requirements and the conditions affecting the construction and operation of the steam generating plant under discussion.

The most important factor entering into the practical phase of the problem, is *load factor*. This term should not be confused with the term *plant factor*. *Load factor* as used here, is the ratio between the average output and the maximum instantaneous output demanded. An installation which is correctly balanced for a high load factor, will probably be top-heavy with fixed charges when used on a low load factor. With a high load factor, the fuel item becomes of the most importance, while with a low load factor the high overhead costs, or fixed charges, as they are more generally designated, force the fuel item into the back-ground. Again, with high load factors the fuel item demands considerable attention, but with very low load factors, the unit cost of fuel has but little bearing upon the total cost of the product.

Building Heating is the kind of service for which this plant was designed. This Union Arcade, in which our Society is housed, is heated from the William Penn Hotel steam plant. The load factor of a steam heating system is almost entirely determined by the weather. The service is seasonable, and with the exception of a comparatively small amount of hot water and refrigerating service, all the demand occurs during the season beginning about October 15th and ending May 15th. The maximum demand naturally occurs during the coldest weather, or at least during the most severe weather, such other conditions contributing as direction and velocity of the air movement; the relative humidity also having a considerable influence. For heating service only, the average yearly load factor approximates 25 per cent.

Fig. (1) shows the distribution of output by months. You will note the large peak and the comparatively small output.

It might be mentioned that one reason why a straight exhaust steam heating system in connection with electrical energy generation is not entirely successful, is because of the *low* load factor on the heating part of the service. The large loss due to inefficient operation in connection with 75 per cent of the electrical output is much greater than the gain due to saving part of the heat in connection with the other 25 per cent of the output, when the steam and electrical output *are* coincident. In other words, non-condensing operation with almost double steam consumption during so much of the time represents a greater loss than the saving during the heating months. Another point to be noted is the lack of coincidence of the heating and lighting, even during the various hours of the day.

If the electric demands are large enough to make sufficient exhaust steam available during the very early morning hours, then a great surplus of exhaust steam

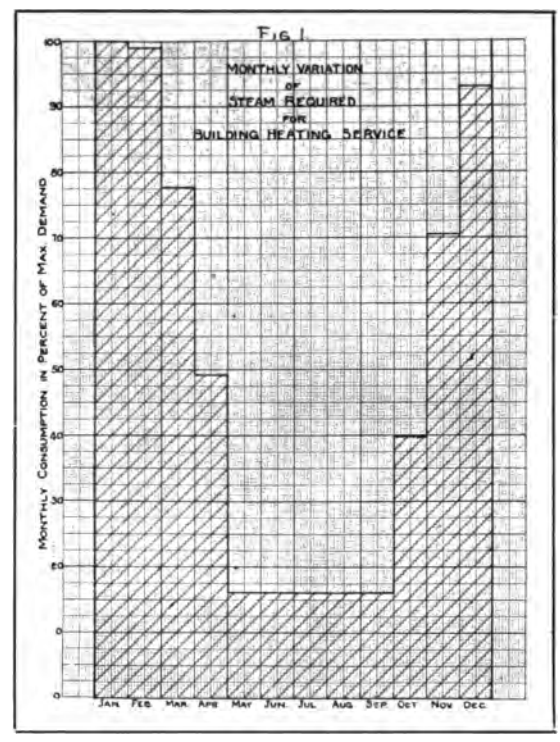


FIG. 1.

will be available when the electric load reaches its maximum later in the day.

The total amount of exhaust steam may equal the amount required for heating during any one day, but the chances are that it will not be available at the time it is needed. The average yearly temperature is 52.6 degrees F., or only a few degrees below the temperature requiring artificial heat, but in winter we buy coal and clothes to keep us warm, and in the summer we buy ice and cold cocoa-cola to keep us cool. Lack of sufficient heat storage is the only reason, because 52 degrees is quite a comfortable temperature. In buildings the amount

Many things difficult to design prove easy of performance.—Johnson.

of heat storage, while greater than that of electrical energy storage (without the use of storage batteries), is a matter more properly measured in minutes than in hours.

This size of the steam generating equipment being larger than can be repaired in the time allowed by the heat storage makes it necessary to install spare equipment even though the load factor is very low, and equipment is standing idle the greater part of the year.

The larger the generating station, the smaller the percentage of spares required. When two or more stations are tied together, the effect on the percentage of spares required is the same as with one large station having the same capacity. Service must be maintained during the entire twenty-four hours of the day, and those installations having hot water or ice machines, during the entire twelve months of the year.

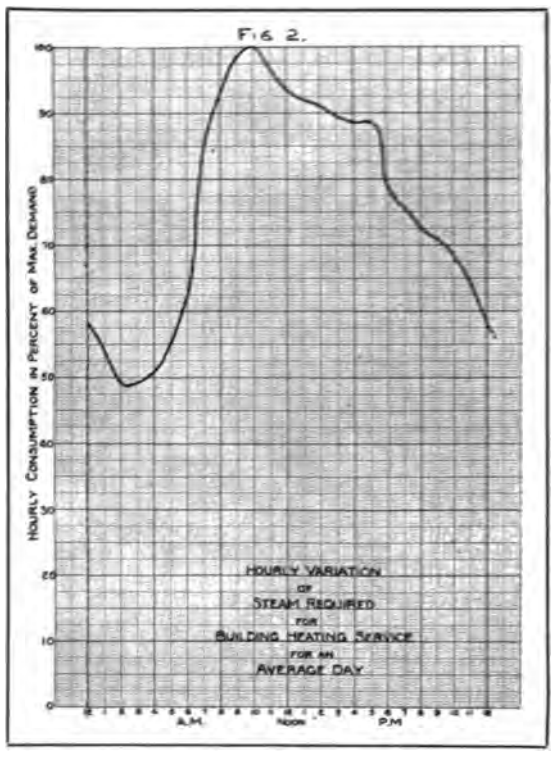


FIG. 2.

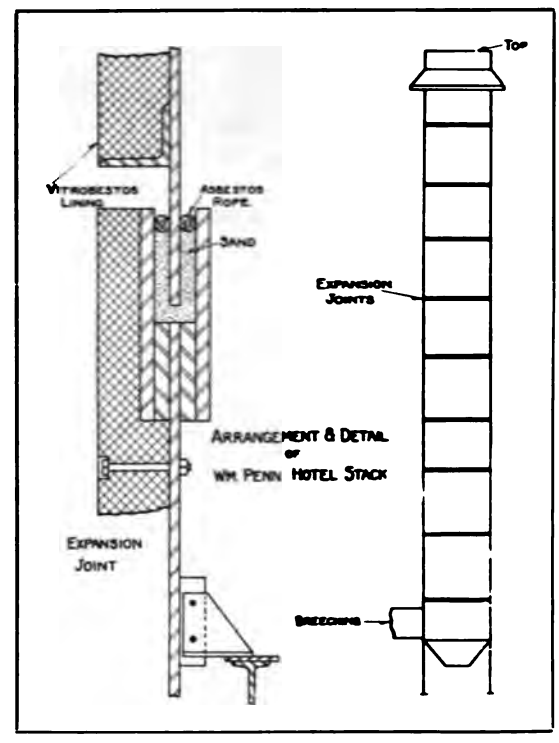


FIG. 3.

Conditions Affecting Construction and Operation: The plant is located under the William Penn Hotel, the boiler room floor being fifty feet below the street surface. On account of being right in the best business section of the city, and directly under the finest hotel, it is absolutely necessary that the plant be operated noiselessly, and that the coal and ash handling systems shall not be dirt and noise nuisances. From the standpoint of the public, one of the great benefits derived from central supply systems, is the reduction of the number of sources and the amount of dirt and smoke, thus making the city cleaner.

With coal as the fuel, a system of hoppers, conveyors, and storage bins is necessary. The narrowness of the Pittsburgh streets makes the unloading item in itself one which demands a careful study. If coal handling is a problem, then ash removal is a greater one, because ash must be elevated, whereas coal will run by gravity through an open chute into the plant. On account of its location, the water supply must be obtained through the city mains. Fortunately, the water consumption is greatly reduced by the return of the condensed steam after being used in the heating systems, so that only a *make-up* supply is required.

The blow-down water must not only be elevated to discharge it into the sewer, but a sufficient storage capacity must also be maintained in order to allow it to cool before it is discharged.

The working conditions are good notwithstanding the fact that not a bit of daylight enters the plant, and all the air for ventilation is drawn in by fans. Although the plant has an available capacity of between four thousand and five thousand horsepower it can easily be operated by one man, in fact, one man is all that is actually used. An electric sub-station adjoins the boiler room and the operators of each act together in case of an emergency.

Type of Installation Adopted: Believing that the solution of any problem depends entirely upon the combination of conditions entering into that problem, the designers endeavored to so combine the basic elements constituting this steam generating plant that a harmonious whole would be the result.

Stack: One of the problems usually included in a boiler plant design is in this case a fixed condition. Unconsciously the architect who designed the hotel or the financier who approved the same design, fixed the height of the stack. At least, the top of the hotel was the minimum height, and there was no occasion for exceeding the 350 feet thus imposed. The location and shape of the

There is no education like adversity.—Disraeli.

stack were also determined by the building design. In turn, the design of the stack was determined even to the insulation.

To take up the difference between the expansion of the steel stack and that of the building, the stack was made in short sections, and supported from the building steel.

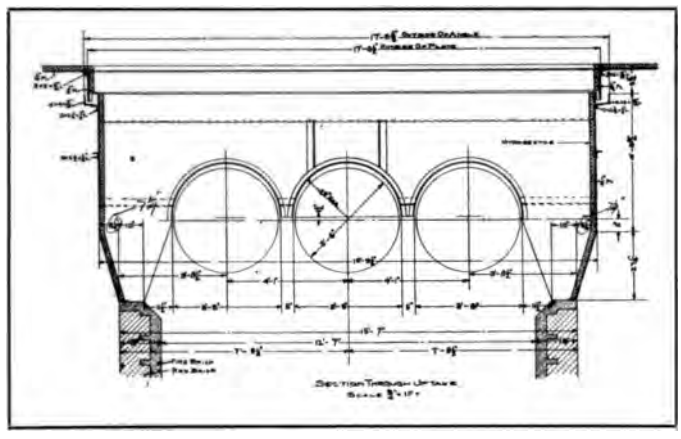


FIG. 4.

A word as to why a self-supporting steel stack with a brick lining was not used, might be of interest. Lack of area forced the use of rectangular stack. Structural features of bracing (in the architect's opinion) determined the sectional design. For engineering reasons, the original design was greatly modified. The original drawings called for a 3/8 in. clearance at each joint. Inasmuch as there was one joint specified for each story in height, the available intensity of draft would have been an uncertain if not an unknown quantity, if it had been built with a "ventilating" opening, 3/8 in. wide around the circumference, at each of the twenty joints proposed. The final design has less than one-half as many joints and these instead of being left open were sealed by the special sand and asbestos joint shown in Fig. 3.

Brick insulation was not used because in the rectangular form, the heat would have caused it to cave in, there being no natural arch as in a round stack. The asbestos insulation is thinner, smoother, and gives more area.

Breeching: The principal points which are called to your attention are the easy bends, the method of caring for expansion and the application of the insulation.

Fig. 4 shows a detail of the type of nozzle connection designed to permit expansion. The insulation is applied to the inside of the nozzle and to both the inside and outside of the breeching proper instead of on the outside only, as in many installations. Insulation on the outside only, while fairly effective as an insulation to reduce the radiation, is dangerous. It is perfectly possible even with a first-class boiler setting, to have a temperature high enough to collapse a steel breeching, if the heat is held in by outside covering. In fact, a serious fire was caused in a new installation within a block of here, by secondary combustion in the breeching. Shutting a damper, or closing the ashpit doors on a hot fire, or even the firing of waste wood will make a gas producer out of most any boiler setting. The application of inside insulation increases the life of the breeching. Care was taken to see that the insulation did not contain elements

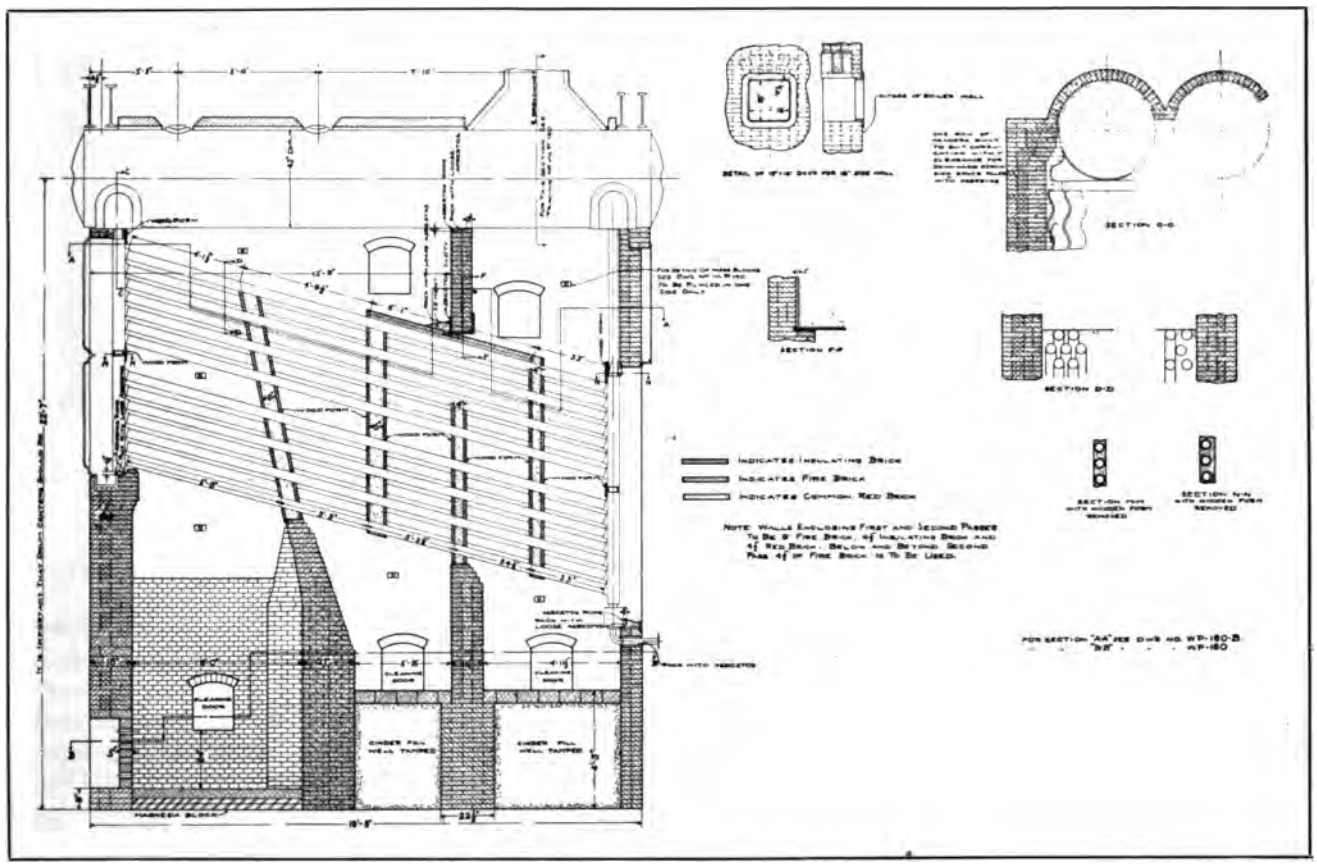


FIG. 5.

Conscience has no more to do with gallantry than it has with politics.—Sheridan.

which, under operating conditions, would cause the steel to corrode.

Boilers: Two of the four boilers are of the longitudinal type and two are of the cross-drum type of the water tube boilers manufactured by the B. & W. Co. Both types are of the same rated capacity, being 600 h.p., and each having 294-4 in. tubes arranged with twenty-one rows in width and fourteen rows in height. The first boilers installed were of the longtitudinal type and were baffled with a special vertical baffle built of a high temperature cement. The economic results obtained with this cement baffle were very good at first, but it was soon found that the cement was falling out, and the stack temperatures going up, so a change to the horizontal type of baffling was made, which is described later in the paper.

It was found, however, that an economic baffling could be constructed at a cost even lower than for the standard three-pass baffle. This is of the horizontal type, and is shown in Fig. 6. The horizontal baffle is shown in a cross-drum bolier, but the tube arrangement is exactly the same. On account of the chances of forming a dirt pocket at the rear of the second pass, this setting is not particularly recommended for coal; however, the horizontal baffling has been used quite successfully with coal, and with the addition of some device or arrangement for the removal of the dust from the pockets, I believe it will prove very successful. The simplicity and ease of installations and renewals of the baffles and tubes make the horizontal type particularly attractive.

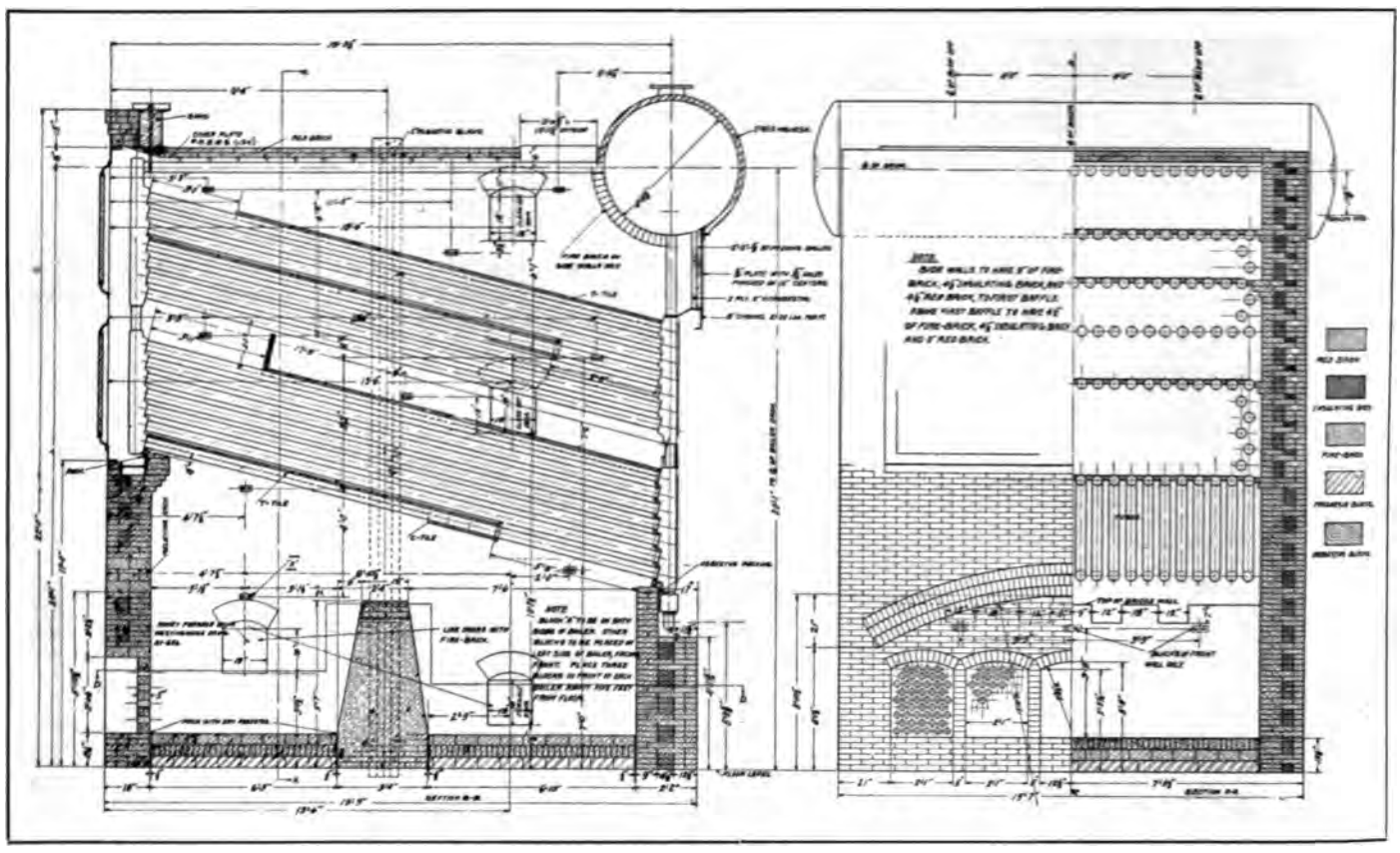


FIG. 6.

The reason the standard three-pass vertical baffling was not used, is that with gas fuel a very small draft intensity in the furnace is required. The high stack without a special baffling is a source of danger from an economic standpoint, an excess of air being drawn through the burner. Instead of reducing the draft intensity by damper regulation, it was decided that it would be better to draw the gas over a longer path, and to impinge it against the tubes at a higher velocity in order that more heat be extracted from the products of combustion, and a higher efficiency obtained.

With gas fuel, a very small excess of air is required. The volume and weight of the products of combustion are much smaller per unit of capacity than is required when coal is used, so that smaller gas passages can be allowed. Fig. 5 shows the original vertical baffling.

Furnace: The striking feature of the furnace design is its extreme simplicity.

The selection of fuel is, of course, the determining factor in the design of the furnace. In fact, the kind of fuel is the determining factor of the whole plant design, but can only be determined after a thorough analysis of the entire problem. It is not enough to determine which fuel is the cheapest per b.t.u. as purchased. The following is an *outline* of the principal items which constitute the cost of steam:

1. Maintenance and fixed charges on all equipment except building which is included in *rent*.
2. Heat delivered to, and absorbed by the boiler.
3. Labor, including administration, supervision, workmen's compensation, insurance, vacations etc.
4. Water including the cost of purifying.

There is no debt with so much prejudice put off as that of justice.—Plutarch.

5. Miscellaneous supplies and expenses.
6. Power for operating auxiliaries.
7. Rent, included in interest of investment, maintenance and depreciation, if building is owned.

Item No. 1 includes the maintenance on boilers, furnaces, piping, coal and ash handling equipment (if coal is used for fuel), and in fact all maintenance charges except that on the building proper. The maintenance and fixed charge item is the one which is apt to be over-

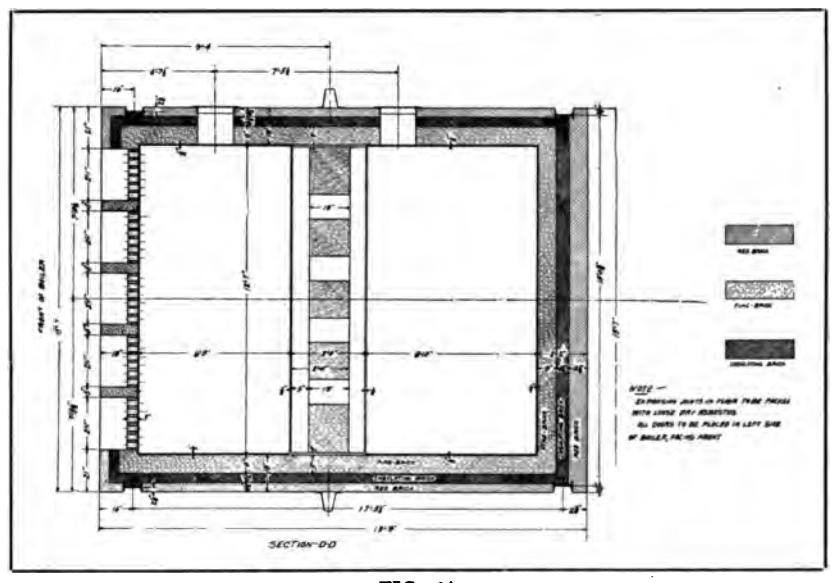


FIG. 6A.

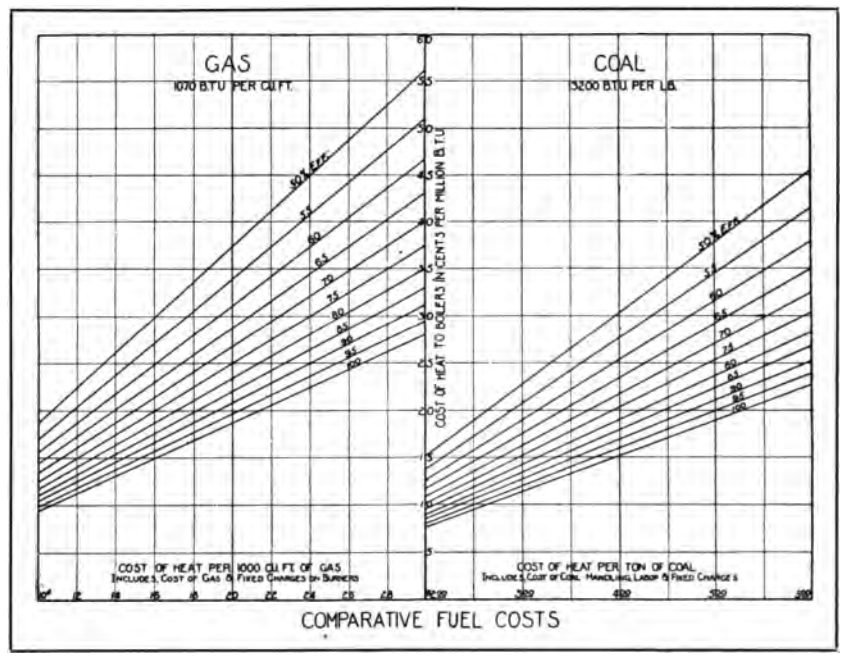


FIG. 7.

looked or given less consideration than it deserves. This is the item that is so much affected by the kind of fuel which is used. Coal requires a very much more expensive equipment than gas. Fig. 7 is intended to show the costs of steam corresponding to the various unit costs of either coal or gas. This curve can be used to make the final decision as to the kind of fuel.

Another and very important point to be kept in mind while making the selection, is the *efficiency* of the furnace and boiler, which can be obtained under *operating* conditions. Even with coal fuel, of different composition, we know that it is not always the fuel which costs the least per b.t.u. as bought, which is the most economical. A cheap coal which gives trouble from clinkering is often an expensive coal because the same percentage of heat is not practically available. The difference between coal and gas is even more marked. The ashpit loss which may amount to from two to ten and even fifteen per cent with a coal fuel is entirely eliminated when gas is used. The other great loss, namely that due to excess air, is less, and is more easily controlled with gas than with coal, because the furnace conditions can be maintained constant.

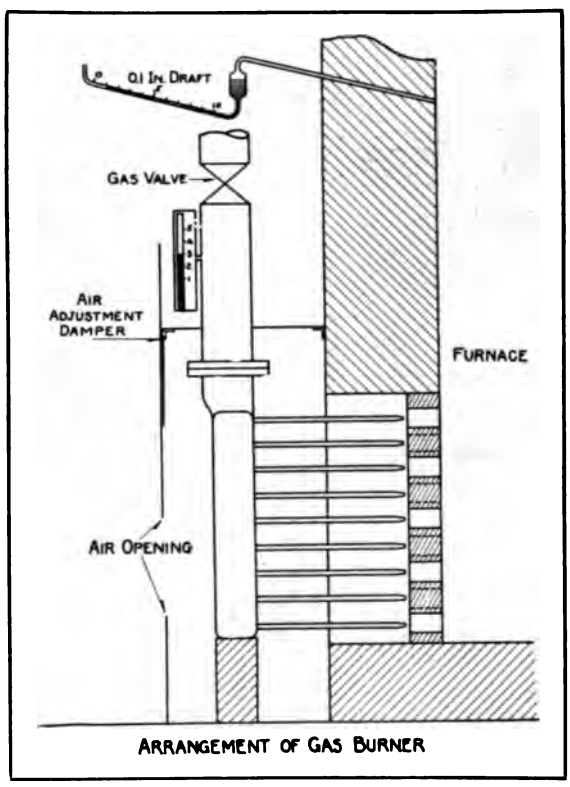
Item No. 3, that of labor, is also considerably affected and it too in favor of gas, because firing conditions are easier, boiler and furnace maintenance is less, and there

The secret of influence is will, whether good or bad.—Robertson.

is no labor required for either the operation or maintenance of coal and ash handling equipment.

The fourth item is not affected to a great extent, except that no water is required for wetting down ashes when gas is used. Items Nos. 5, 6 and 7 will also be affected but not to any great extent except that the power for operating stokers and coal and ash handling equipment will not be required, when gas is used.

The method of solving for the kind of fuel has been given, rather than a statement showing the size of plant and conditions under which the one fuel should be used in preference to the other, because with the cost of fuel and particularly the cost of equipment changing so much, any such statement would be obsolete before it was published. As a matter of information, however, it is stated that at the time this plant was first considered the total costs would have been approximately equal with gas or



ARRANGEMENT OF GAS BURNER

FIG. 8.

coal, when the maximum load on the plant amounted to about one thousand five hundred horsepower. At lighter loads, the gas was much the cheaper and at heavier loads the coal showed a saving. Since then, however, a great increase in the price of coal and an equal increase in the cost of coal handling equipment and stokers, amounting to approximately 100 per cent, and an increase in the price of gas amounting to about 50 per cent, have changed the situation so that the costs are even at a much higher load.

The design of the furnace for gas, which was the fuel selected, was determined almost entirely by the conditions present in this particular installation. Only a little weight was given to the gas furnace designs found in Pittsburgh, and in the gas fields of West Virginia, in fact the Pittsburgh designs were entirely discarded, and only the basic principle of one type of burner design, found in West Virginia, used. The burner being the most important part of the combustion apparatus, considerable attention was given to it.

The reasons why the commercial burners now on the market were not used are:

1st. The air and gas could not be easily controlled with any degree of certainty.

2nd. At low ratings or with low gas pressure, trouble from *burning back* was experienced.

3rd. When the burners are shut off, all of the air could not be shut off, most of the burners having a secondary supply of air to prevent the end of the burner from being burnt. This excess air could not be shut off.

4th. The secondary air principle is wrong, and tests of the mixing feature of the burners themselves by the use of smoke and bridge wall temperature investigations, showed that the air through the center of the burner was really a cold core and the steam lines were not broken up.

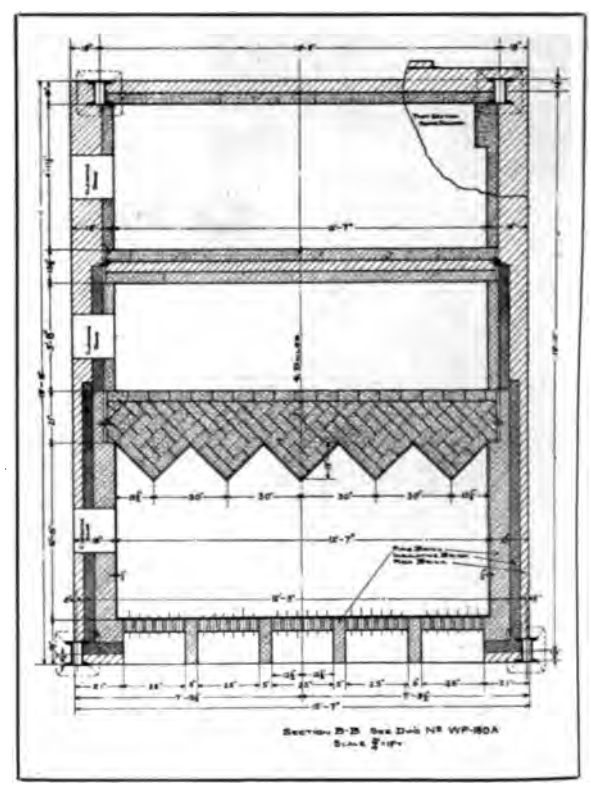


FIG. 9.

5th. The initial cost of the commercial types seemed prohibitive and the cost of renewals high.

In the new design, an endeavor was made to overcome all of the above objections, and up-to-date the results have shown that the new design is a success. The most valuable feature of the new burner is the absolute control of the quantities of gas and air. Another of almost equal importance is the thoroughness of mixing before entering the furnace, without allowing the burner to flare back. Fig. 8 shows that both the air and gas are absolutely under the operator's control, and further, that although the gas and air are kept separate up to within a few inches of the furnace, a mixture with a very fine sub-division is made, the gas and air being separated only by the walls of the small pipe.

No attempt has been made to make the gas and air control entirely automatic. It was felt that neither the air

Prosperity is a great teacher; adversity is a greater.—Hazlitt.

r the gas should be controlled independently by an tomatic device. It has been found that the amount time required for gas and air adjustments is small, d it is believed that the advantage of the simplicity is re than enough to off-set the costs of hand operation. The proper adjustments to determine the correct ratio tween the quantities of gas and air are determined by e use of a single "U" tube. This, as you will notice Fig. 8, is connected direct to the gas chamber between control valve and the mixing nozzles. A schedule the correct position of the air damper has been de- mined by special and operating tests. For the sake simplicity the damper is so marked for any gas pres- re that the damper position is indicated by the same are which represents the gas pressure. The quantity air is determined by the position of the air damper cause the drop in pressure between the boiler room d the furnace is maintained constant at one-tenth of inch of water. This figure was decided upon as a mpromise between a high draft loss through the burner th its disadvantage of causing an increased leakage through the setting, and a very low draft loss, a ght change of which would cause a large percentage change in the quantity of air.

the bridge wall as it was to give more contact surface with the flame and assist in mixing the gases. With the horizontal baffling, a medium height bridge wall, with a slightly raised pillar in front of each burner is all that

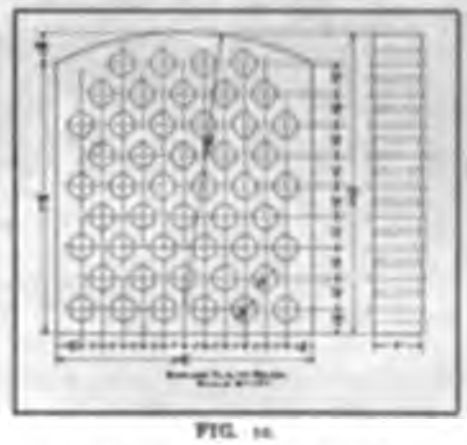


FIG. 10.

is used. This is shown in Figs. 6 and 6a. Of course the roof formed by the "C" and "T" tile is of great assistance to combustion. Much has been written regarding the volume of combustion chamber required

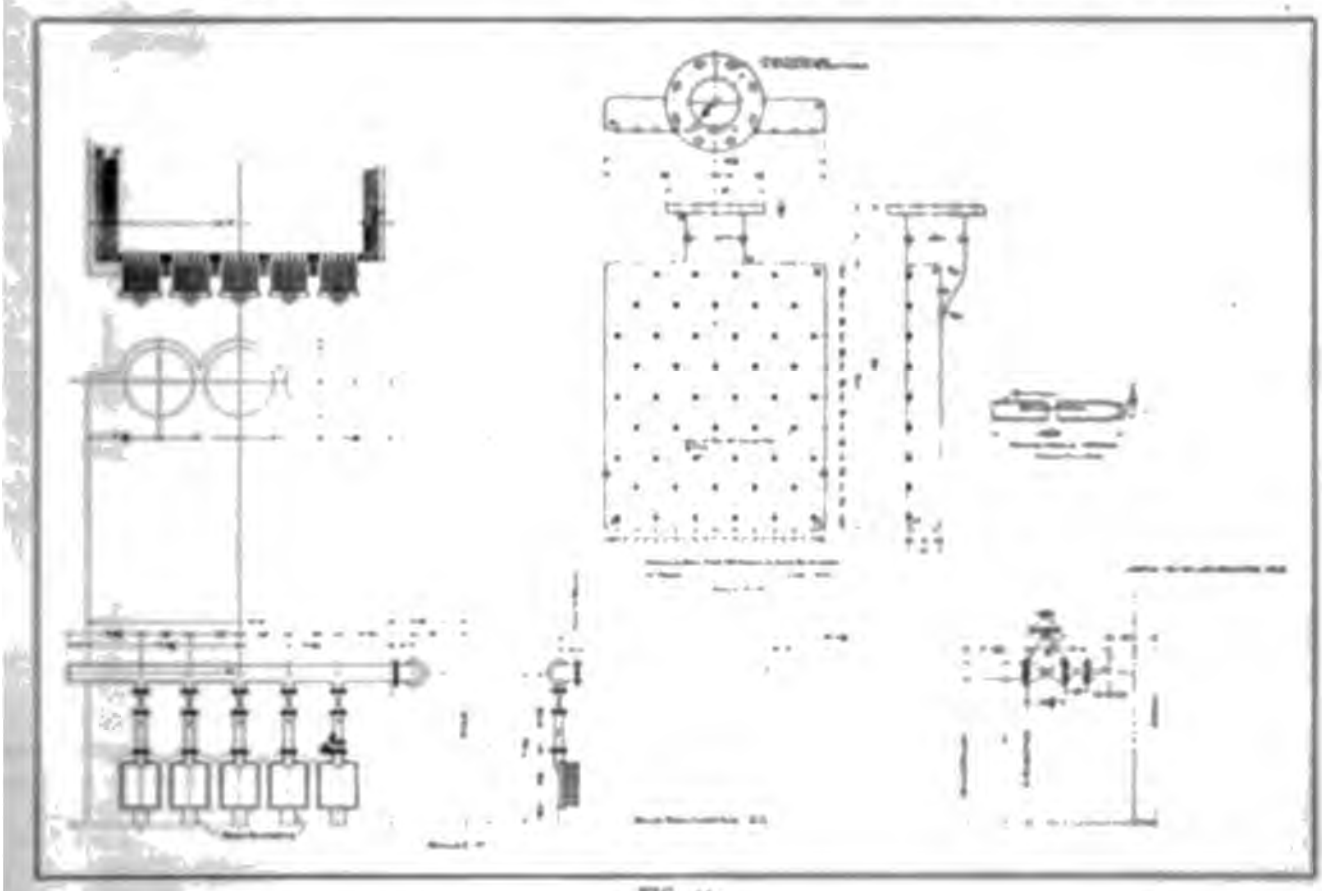


FIG. 11

is all very simple, the side walls being ng insulating brick between the fire red brick. No checker work is used. ical backs the bridge wall which was more combustion space, was rein- V-shaped pilasters, Fig. 9. This as much to increase the strength of

for different capacities. Figures have been given showing that it requires a certain number of cubic feet of space per horse-power in order to complete combustion, but it would seem that with gas as a fuel, these figures are all too high, in fact, it is doubtful whether the question of volume is a very important factor. We know that the two controlling factors of combustion are

is the spirit of which words are embodiment.—Alcott

temperature and mixture. The temperatures are always sufficiently high if all the combustion is completed, as it should be, before the gases come in contact with the cold tubes. Mixture, then, is the factor which must be given the most consideration. To use an extreme as an illustration:—if a gas pipe of, say, two or three inches in diameter were opened directly into the furnace, it is very likely that the flame would extend almost entirely through the different passes of the setting, because the mixing is very poor. If, on the other hand, we might imagine the whole front of the furnace as being composed of Bunsen burners then it is very likely that the combustion would be entirely completed within a few inches and certainly within two or three feet of the front of the furnace where the burners are installed. These, of course, are extremes, but they illustrate the principle. The burner we have adopted is in reality a multiple Bun-

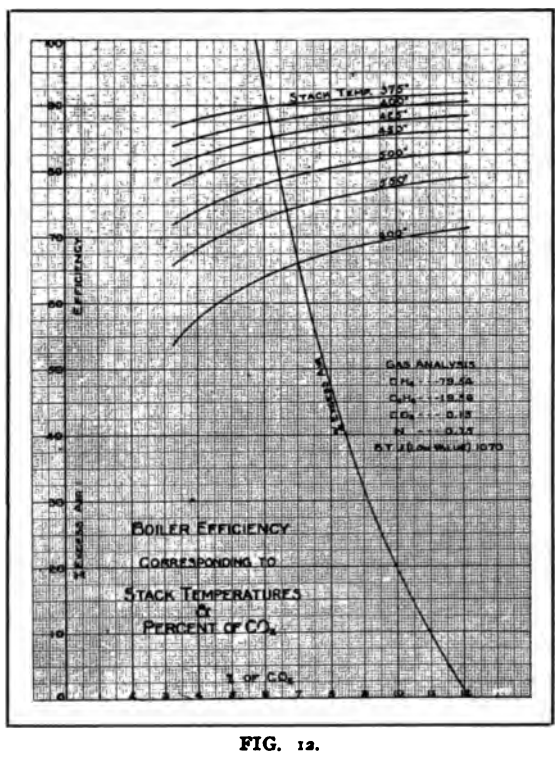


FIG. 12.

sen burner. As shown in Figs. 8, 10 and 11, each burner consists of forty-eight 7/16 in. nozzles delivering gas from the manifold to the 2½ in, air openings.

Economic Performance: The plant under discussion is not very old, but the regular operating performance has proved that there is at least some merit in the installation. Contrary to your expectations, no extended series of tests will be published at this time; however, a statement is included which shows the average monthly efficiencies obtained in actual operation from October, 1916, to and including April, 1917. This data is in one sense the result of a continuous test. A statement is made up every eight hours by the operator for the same period, showing the essential facts for that period. Every pound of water to the boilers is weighed, every pound of water blown or allowed to leak out of the boilers through the blow-down, is weighed and deducted, and every cubic foot of gas metered. Even the radiation in the pipe lines within the plant is charged to the boilers and every pound of this is deducted from the output.

Months	Average Efficiency
October, 1916	78.9
November	77.2
December	78.4
January, 1917	85.2
February	83.5
March	78.0
April	78.2

Flue gas analyses are not made continuously or even periodically, because with the positive burner arrangement it does not seem necessary. During the tests to determine the best burner arrangement, the gas analysis representing good adjustment was about as follows:

CO_2	11.4%
CO	0.0%
O_2	.9%
N.	87.7%

It was found that when an attempt was made to still further reduce the air, CO began to form. Since the efficiency is only slightly affected by an increase in the CO_2 even from as low as 10 per cent if the stack temperatures are kept low no attempt was made to eliminate the small per cent (approximately 5) of excess air which was still present. The chances of decreasing the efficiency by incomplete combustion are probably greater than those of increasing the efficiency by decreasing the amount of excess air below that minimum. Fig. 11 indicates better than I can otherwise describe, the interrelations between air excess, percentage of CO_2; stack temperature, and efficiency.

An average analysis of Pittsburgh natural gas is about as follows:

Methane (CH_4)	79.54
Ethene (C_2H_6)	19.56
CO_2	0.15
Nitrogen (N)	0.75
B. T. U. (low value)	1070

The reactions for *perfect combustion* are:

.7954 CH_4 + 1.5908 "O_2" = 0.7954 "CO_2" + 1.5908 H_2O
.1956 C_2H_6 + .6846 "O_2" = .3912 "CO_2" + .5868 H_2O

Which gives for products of combustion:

1.5908 + .5868 = 2.1776 cu. ft. H_2O Vapor.
.0015 + .7954 + .3912 = 1.1881 cubic ft. CO_2 Gas.
Nitrogen with oxygen air 20.9%; O_2 — 79.1; N_2)
(1.5918 + .6846) — 79.1 ÷ 20.9 = 8.6001 cu. ft.
Adding initial N_2 — .0075 cu. ft. = 8.6076 cu. ft.
Maximum theoretical CO_2% dry gas by Orsat.
100 (1.1881 ÷ 1.198 + 8.607) = 12.135%.

MONTHLY EFFICIENCY RECORD AT THE WILLIAM PENN BOILER ROOM.

Month	Boiler Feed Pounds	Drain and Blow-Down Pounds	Net Steam Generated Pounds	Fuel Gas Cubic-Feet	Efficiency Evaporation Lbs. per cu. ft. F.&A. 212°	Per Cent.
October	6,257,000	29,000	6,228,000	7,977,000	.87	78.9
November ...	10,171,000	33,000	10,138,000	13,251,000	.852	77.2
December ...	16,660,000	43,000	10,617,000	21,867,000	.865	78.4
January 1917	24,240,000	816,000	23,424,000	28,728,000	.94	85.2
February ...	23,803,000	763,000	23,040,000	28,917,000	.921	83.5
March	19,675,000	1,922,000	17,753,000	23,460,000	.861	78.0
April	15,257,000	776,000	14,481,000	18,563,000	.863	78.2

During the months of October to April, inclusive, the average monthly efficiencies you noted were never lower than 77 per cent, and sometimes as high as 85 per cent. The lower efficiencies are due to radiation at light loads.

Commonly we say a judgment falls upon a man for something in him we cannot abide.—Selden.

Also remember that these figures do not represent a few hours or even a day, but are the averages covering whole months.

The efficiency results are not what a corps of expert engineers and chemists can do when watching every adjustment, but what has actually been accomplished by the regular operators while attending to and taking an interest in all their other duties.

Every cubic foot of gas entering the plant has been charged against the boilers. No credit whatever has been allowed for firing up cold boilers or for the heat carried away in the blow-down water. The plant has been considered as the unit rather than the boiler.

The figures you have seen represent the performances during the construction period, when the only instruments available for use were a couple of draft gauges and about a half dozen improvised U tubes. The complete installation of instruments should further improve conditions.

Conclusions: Briefly summing up, the success of the installation is due to:

1. The cutting out of the loss of draft through the damper and substituting the resistance of a longer path through the boilers, obtaining better heat absorption.
2. The design of a durable burner which will give correct mixture under all conditions.
3. The maintenance of the proper interest of the operators.

——Courtesy Engineers' Society of Western Pennsylvania.

AMERICA'S GREATEST ASSET.

Professional Division of the United States Employment Service Assists Experienced Technical Men of the Army and Navy to Find Their Places in Work of Reconstruction.

AMERICA'S greatest assets, the brain power and energy of her thoroughly trained young men, are the commodities in which the Professional Division of the United States Employment Service is dealing. Officers and men of the Army and Navy released from active service are being registered with the Division, and placed in touch with those employers who can best make use of their services.

The Professional Division deals only with those men who are well equipped by education and experience in their particular lines of work. The record of each man is carefully investigated before registration is permitted. Many university graduates in mechanical, electrical and civil engineering, and in chemistry, and other technical men with several years of practical experience, have already been registered. These men who willingly severed their business relations more than a year ago to give their services to their country, are returning to civil life to find changed conditions. Although the industry of the country has great need of their services, neither men nor employers are able, without assistance, to discover each other immediately. To avoid delay in the readjustment processes, not only the labor of the country but also the highly trained directors of industry are being mobilized with the asistance of the Government. The aim is that each man shall fit in that part of our business organization where he can do his best work.

The task of dealing with thoroughly trained men who in many instances can command high salaried positions is requiring the assistance of those technical organizations which they heretofore placed university graduates and experienced men with employers. The Professional Division is seeking to co-operate with all such societies by referring properly qualified men to them, or by obtaining from them data on positions available.

The engineering field appears to present the largest problems of the Professional Division. Thus far, nearly one-half of all the applicants have been qualified for work in various forms of the engineering profession. The temporary lull in general construction work has in part closed one field which, it is believed, will be more available by the time the overseas forces begin a large scale demoblization.

The Professional Division of the United States Employment Service has its New York office at 16 East 42nd Street. Its registrations of experienced men are increasing. Employers seeking such men are asked to inform the Professional Division of the precise nature of the positions which they have available. Only those men who are well qualified to fill such positions are referred to the employer.

ZONING SYSTEM SAVING MILLIONS.

ESTIMATES made earlier in the fuel year, that approximately 160,000,000 car miles would be saved in the coal year through the operation of the zone system for the distribution of bituminous coal, are being fully realized, it has been announced by the United States Fuel Administration.

This system, made possible through the close cooperation of the United States Railroad Administration with the Fuel Administration, has had a large share in bringing the nation's supply of bituminous coal to its present proportions, which, with patriotic economy, will be sufficient for the winter's requirements.

This method of distribution was established so that the coal supply of all sections of the country should normally be derived from mines relatively near, thus preventing abnormal and wasteful transportation movements, and insuring more equal distribution of cars to the mines and the more steady employment of mine labor.

Early estimates were that the movement of bituminous coal affected by the zone system would involve about 300,000,000 tons, or 60 per cent. of the total production. The latest figures, show that 368,858,000 net tons of this kind of coal have been produced and delivered since April 1, 60 per cent. of which is affected by the zone system.

These later figures show that even more than the originally estimated 160,000,000 car miles will be saved in round-trips to and from the mines and that considerably more than the 300,000 additional trips, which the saving in car-miles would effect, will be made. Exact figures have not been compiled, but the early estimate allowed for the 300,000 additional trips being the equivalent of 5 per cent. increase in the production.

Truth is the highest thing that man may keep.—Chaucer.

Mixing Gases

The Mixing of Natural and Manufactured Gas Has Produced Results as Noted in California.

By FRANK S. HONBERGER.

A lengthy paper upon this important subject was submitted to those present at an important gathering of Pacific Coast Gas-men under recent date. The matter presented has been somewhat briefed, though the salient points have been retained.—Editor's note.

WE must make positive the practicability of the use of a mixture of natural gas with artificial gas. Research has been the order of the day in order to bring about a thorough knowledge of what may be expected, and what may be accomplished. The use of natural gas as a constituent of a mixed product is influenced by the lack of sufficient quantity to warrant its continual employment. The first question which confronts its adoption as a portion of a mixture is the possibility of stratification taking place when a gas of .70 specific gravity is added to one of .50 gravity. In order to gain information concerning the diffusion of gas, a method described in Traver's "Study of Gases" was employed by the writer. Quoting from text book, the following statement is made on the diffusion of gases: This term, though employed by Graham in describing the passage of a gas through a porous septa, should more properly be applied to the mixing of two gases brought suddenly into contact over a free surface. The subject was studied by Loschmidt, of Vienna, and the results published under the title of "Diffusion of Gases Without Porous Septa." A glass tube 1,000 millimeters long and 55 millimeters in diameter, was divided in the middle by a thin steel shutter, in which a hole, equal in diameter to the inner section of the tube, was pierced. The two halves of the tube were filled with different gases and the shutter was moved so as to bring them in contact for a definite period of time. The degree to which the gases had mixed was determined by chemical analysis."

The apparatus used to verify the intimate mixing by diffusion and the non-stratification of the constituents of the mixed gases, consisted of 20 feet of 4-in. pipe, both ends plugged and a separating valve in the middle. Natural gas was charged into one-half of the pipe and artificial gas into the other. After charging each end with the gases in question, the separating valve was opened and the gases allowed to intermingle for 15 hours, when heat determinations were made. Results were as follows:

	B. t. u.
Top	658
	650
Middle	648
Bottom	651
	648

The artificial gas of .50 specific gravity was introduced into the upper half of the 4-in. pipe and the natural into the lower portion.

To make positive that no stratification took place, the position of the gases was reversed, the natural gas being introduced into the top, and the artificial gas into the lower half of the testing unit. A tabulation of the work of one test is given below:

	B. t. u.
Natural gas	1,000
Artificial gas	625
Top	810
Bottom	813

It will be seen that a mixture evidently took place, since the lower half had a heat value of 1,000 heat units and the upper a value of 625 heat units. Upon allowing the two gases to intermingle, the heat values are equalized, but three heat units difference in the showing between the upper and the lower ends of the pipe.

Photometric Observation.

After being assured that no stratification took place, considerable research was done to find the results of photometric observation upon various mixtures of natural and artificial gases, and to this end a series of such mixtures were made, ranging from 10 per cent. to 80 per cent. of the natural product. The various combinations were then observed for heating value and candle power, using a Junker's calorimeter and a Queen photometric bar, respectively. With the bar, a certified "Metropolitan Argand burner No. 2" was used—since this burner is designed to give the best lighting results by the use of an air regulator.

A point, however, owing to air regulation, was reached, at which the above burner could not be used and an aluminum open tip burner was substituted. For mixing the gas, a 5-foot gas prover was used. The heating value of the natural gas was 1,050 B. t. u. and the candle power was 9.0 candles. Instead of burdening the reader with a detailed account of the results of the

Principle is ever my motto, not expediency.—Disraeli.

individual cases, a brief summary will present the information acquired.

Per Cent. Nat. Gas	C. P. Art. Gas	C. P. Mixture	B. t. u. of Mixture	Ratio of C. P. in. Mix. to B. t. u. Mix.
10	18.74	19.22	592	30.8
20	16.57	19.51	640	33.1
30	17.55	20.77	700	33.7
40	13.16	19.26	687	35.7
50	17.33	19.50	688	35.3
60	17.48	21.20	748	35.3
70	13.99	21.38	782	36.6
75	14.65	20.50	825	40.2
80	16.40	10.35	871	84.2

An inspection of accompanying tabulation makes prominent the fact that, although there is a constantly decreasing percentage of artificial gas the candle power is maintained up to the addition of 80 per cent. artificial gas. With a constantly decreasing artificial gas content, but a rising heat value, the ratio of the candle power to the heat units remains nearly constant up to a critical or breaking point.

A statement can be made at this point: With a gas of relatively high heating value, the candle power does not seem to depend upon the amount of carbon particles present, but upon the incandescence to which they are brought. This seems to be true up to the just mentioned critical point.

Mixing Large Quantities.

After having done the preliminary investigations upon gas mixtures in the laboratory and decided upon the practicability of their use, the question of mixing of larger quantities and controlling the proportions decided upon, arose. Any one of three distinctly different methods may be used to give the results desired (i. e.), mixing the natural gas in oil gas generators while the generators are engaged in manufacturing artificial gas; using natural gas as an enriching medium for water gas, in place of oil; mixing natural and artificial gas on the way to the storage holders, measuring the natural gas before the mixing takes place. Of the three plans the last one is undoubtedly the most feasible, since in both of the first two, an enormous amount of heat would be required in bringing the cold gas to the temperature of the generating apparatus.

Natural gas as delivered to the meter station is usually at a pressure considerably in excess of that at which the artificial gas leaves the purifying boxes after being forced through them by the exhausters. Where station meters are being used the back pressure from the holders is the same against both the artificial and the natural gases, so that, with the latter delivered to the mixing station at a higher pressure than the former it is necessary to reduce this pressure by permitting the natural gas to expand into an expansion drum—the quantity expanded being governed by a valve in the natural gas supply line. In order now, to maintain the ratios demanded, close attention to the meters registering both gases is necessary. That it can be done with extreme accuracy is indicated by the fact that for months the ratio has not varied 0.2 per cent. either way of the desired proportions.

Napthalene Removal.

In maintaining the heat value of the gas as required by city franchise and also the percentage of the natural product demanded in the mixture, the artificial gas generators are operated at heats which tend to produce considerable napthalene. Before mixing with the natural gas this napthalene is entirely removed in the scrubbing since the natural gas tends only to decrease it in proportion to the ratio of the mixture of the two gases.

Leaving the point of mixing and entering the distribution system especially after the gas has passed through the compressors the decrease in the amount of drippage over a 600 B. t. u. artificial gas is noticeable. It is easily understood since the artificial gas in the mixture has been generated at high heats and the complex oils originally constituting the drippage have been cracked to fixed gases and thus eliminated from the condensate. Not only is this due to the decrease in the artificial gas made, but also to the fact that this article has been decreased in volume dependent on the proportion of natural gas added.

Effect on Meter Diaphragms.

In switching from a 600-heat unit artificial gas to a mixed gas of artificial and natural, the leather diaphragms in the consumers' meters immediately showed the effect of the change and several diaphragms were examined. After making a series of observations upon these leathers a theory was evolved from the deductions made which has probably covered the phenomena noticed. Drippage, or condensate from a meter containing an exceptionally large amount, was examined and found to consist of a considerable quantity of a blue sludge or muck and a small quantity of benzole. This is probably a misnomer since the gravity of this oil was 35.4° Be while true benzol has a gravity of 28°—28° Be at 60° F.

Upon acidifying the sludge with hydrochloric acid it was found soluble and gave evidence of a dark green approaching or blue color. This sludge, upon being heated with caustic potash, lost its blue color and a heavy precipitate of ferric hydroxide was thrown down. Upon leaching the dried leather with carbon tetrachloride and distilling off the solvent, no evidence was found in any mineral oil, though, of course, some animal oil was present. The leather itself was dyed a decided blue. From the foregoing observations, the following course of reaction of the artificial gas upon the diaphragms was deduced.

Artificial gas, coal or oil gas, contains some cyanogen compounds, which consists of carbon and nitrogen. These compounds, coming in contact with water, are dissolved and are naturally found in the condensation or drippage. In contact with the interior of the meters

these liquid cyanogen solutions from iron salts, which are evidenced by the deep green or blue coloring of the sludge and the leather of the diaphragms. In composition these cyanogen salts of iron are probably akin to prussian blue. Further evidences of this action of the cyanogen compounds in the gas is found in the pipe scale, which at time stops small services, or scales and corrodes valve stems in some of the larger mains. All of these pipe scales contain large amounts of prussian blue.

To summarize, the following facts can be accepted: Dry gas—artificial mixed or natural, has no effect upon the diaphragm. It is only when a large amount of condensation is present in artificial gas that the injurious effect is noted since those detrimental constituents of the gas are put into such a form to be chemically active. An artificial gas, entirely devoid of those obnoxious constituents, would have no injurious effect upon the diaphragms, even though it did carry a large amount of moisture. In the case of a mixed gas, the natural gas, which is practically inert, simply acts as a dilutent and also as an absorbent for the excess moisture, in which case the moisture is carried through the meter to the burner. To say that natural gas has an injurious effect upon a diaphragm used with artificial gas is purely a matter of personal opinion. Granted that by drying out the moisture the leather is stiffened and the meter slowed down, can scarcely be said to be injurious. If the leather has suffered any actual injury, such as shrinkage of the tissue, it has occurred before the natural gas has come in contact with it. This has been caused by the astringent effect of the dissolved obnoxious constituents of the gas.

Effect on Appliances.

Coming now to the real subject matter in hand, the effect of a change in the quality of a gas upon the consuming devices in which it is to be used, the best possible manner of treating the problem is to generalize. In itself it is a rather difficult proposition upon which to do any extensive research, for the reason that the problem simply resolves itself into the application of various facts which apply to the phenomena of combustion. Let the person to whom the problem of solving the effect of a change in the heat value of the gas with which he is dealing become cognizant with the bunsen burner and the manner in which combustion takes place, no difficulty is experienced. Whether the burner be a star, a ring—pipe or pedestal—the same general rules hold for the combustion of high or low heat value gases to be consumed by the respective device.

With the change in the quality of gas naturally a different set of conditions come into existence so that a burner adjusted for a gas of certain heat value and gravity must be so altered in adjustment to burn the new gas to be consumed. The factors influencing this change are first the alteration in the composition of the gas, and the next the amount of air necessary to properly consume the new gas—both primary and secondary air must be taken into consideration.

Adjustment of Burners.

With the assumption that the heat value of the new gas has increased, the explanation of any change necessary in adjustment will be simplified. As previously mentioned, one of the factors influencing the change in adjustment of a burner is the composition of the gas. This may be evidenced by the increase in specific gravity, going on the supposition that this increased weight is due to an increased percentage of hydro-carbons and not carbondioxide. A burner usually has been designed to burn a gas of a certain heat value—and within certain ranges, will do so efficiently and economically—but beyond this range, is overloaded. A simple comparison is to imagine a burner to be the fire box of a boiler which has been designed to handle a certain amount of fuel. Introducing into this burner, through an aperture originally designed for a gas of certain quality, a gas of increased calorific power, is identical with increasing the depth of a fire on the grates beyond the ability of the fire box to consume it. Still applying the simile of the fire box, the grate surface is sufficient to properly care for a certain amount of carbon or hydro-carbons. The same is true of the gas burner—it, too, is designed to properly consume a certain weight of gaseous hydro-carbons and beyond this weight it is overloaded, if the orifice or aperture is unchanged. If the slight effect of the increased gravity of the gas upon the volume flowing through an orifice be disregarded, it will readily be seen how a greater weight of combustible will be admitted to the burner with the increased specific gravity of the gas.

The foregoing has been but a brief review of what the conditions would be were an attempt made to use a richer gas in a consuming device designed for a leaner fuel. To meet the change it can readily be seen that the needed alterations consist in simply cutting down the amounts of richer fuel admitted until it approximates the same weight as that of the leaner fuel for which the burner was originally designed. To cut this volume down, if the orifice is adjustable, is an easy matter, if a spud, it can be hammered.

The problem does not, however, consist only in the permanent adjustment of the burner for a higher calorific gas, but in meeting the extreme conditions accompanying the sudden change caused by a variation of from 200 to 500 heat units. With such extremes a happy medium must be chosen which will permit safe consumption until proper economic adjustment can be made. With open burners the danger lies in extinguishing the flame only; with the oven, however, the possibility of an explosion is always imminent, because of the fact that the oven is not designed to carry away the products of combustion or partially consumed gases such as would be formed with an excess of gaseous fuel introduced in the case of gases of high calorific value. The "smothering out" of a flame is the difficulty encountered in oven burners and is the most difficulty with which to contend. To alleviate this difficulty the oven flues must be increased in area as well as adjusting the burners.

Actions of the last age are like almanacs of the last year.—Sir John Denham.

GAS DISTRIBUTION.

BY L. K. WHITEHEAD.

IN writing this paper, I assume that the plant is built and is of ample size to take care of the growth of the business for several years to come. To get our product to the consumer, it is necessary that we have mains, services, meters, etc., and, therefore, I will commence with mains.

Gas mains are of two classes—high pressure and low pressure. High pressure mains are generally laid with steel screw or plain pipe with Dresser Pattern Couplers, and in the last two years welded joints on steel pipes have been used successfully. High pressure mains should be laid with a fall to low points and drips installed, fitted with cocks at the surface of the ground so that the drips can be blowed. Care should be taken that all mains are laid deep enough, so that the services on the long side of the street will fall to the main, also that the bottom of the trench is good solid ground and, in the event that it is necessary to block up the main, we should use brick or rock, but never wood. The best practice for laying high pressure main is, when you do not have sufficient holder capacity, to lay it in a belt around the city and feed back into the low pressure system at convenient points with regulators or reducing valves at a pressure of from four to eight ounces.

In artificial gas manufacturing, high pressure is considered anything above ten pounds per square inch; in natural gas, anything above twenty-five pounds per square inch. The advantage of using high pressure is that you can use smaller mains, thereby cutting down the initial cost, but your chance of leakage will be greater. All high pressure mains, when laid, should be tested with air at about twice the pressure you contemplate carrying on the line, and the test should be left on several hours and notes should be taken of the drop, while the workmen are going over the main with soap suds to discover any leaks that may appear.

Low pressure mains are usually cast iron hub and spigot pipe with lead joints either moulded or lead wool; in some districts, cement joints have been used with more or less success. Cast iron mains should be laid on solid bottom of trench and care taken to give it proper fall, with drips at low points, tapped under the bottom of mains if a pipe type of drip is used. Of course, no tapping will be necessary if a line drip pot is used.

Care should be taken to choose the streets with the least traffic on which to lay important feeders, and the alleys should always be used in the business district wherever possible. In laying our mains, we should put in crosses at the street intersections of ample size to take care of any future business that might arise.

When it is necessary to cross railroads, care must be taken to get the mains deep enough to avoid any vibration caused by heavy trains. A joint should never be directly under either rail. It will pay to go to considerable expense to keep all joints out from under the railroad tracks.

After our mains are laid, our next step will be the services. Services should never be laid smaller than one and one-fourth inch pipe and should be fitted with a curb cock and box and, wherever possible, should be laid with fall to the main. Where the main is four-inch cast iron or smaller, the main should not be tapped larger than one inch, unless it is saddled, and all wrought iron or steel pipes should be saddled for service connections. On low pressure services, the service should come off the main with two street ells, making a swing joint, so as to take care of any variation of the main.

High pressure services are laid the same as low pressure, except the main is always saddled and a service tee is screwed into the saddle and a street ell into the side outlet of the service tee. The ditch is then dug to the curb and the pipe screwed into the street with a curb cock at the curb open. The main is then drilled down through the service tee. When drilling is completed, the drilling machine is removed at the service tee, plugged, and the cock then shut off. This method can be successfully used on all pressures up to fifty pounds, but above fifty pounds, the drilling of the main should be through a gate valve or cock. Where consumers are taken off the high pressure line, an individual regulator is installed just inside of property line. Never put a regulator inside of the building, as it would increase the fire and explosion risk.

After the services come the meters. Meters should have careful attention, as to setting, removing and keeping in repair, as they are the heart of your business. Meters should be set in a convenient, dry, and protected place, as near the main as possible, so as to provide easy access for reading and prevent the fraudulent use of gas. The connections on meters are of three forms, rigid, semi-rigid, and flexible, and the best way is a disputed question with gas-men. I will name the three ways and you may take your choice. The rigid way is with straight iron pipe connections to both ears of the meter; the semi-rigid is one lead connection and one iron pipe connection; the flexible is with both ears connected with lead pipes.

When the laying of mains is completed, a careful record should be made in the nature of a drawing of the street by blocks, showing depths at different points distant from the property line, location of fittings, drips, etc. Services should be treated in this same manner, and the card system for services is being used very successfully by many companies.

Great care should be used in tapping mains or cutting in fittings to protect the workmen from asphyxiation, even if the gas is *not* poisonous. *Always* "Safety fiirst!"

—Southwestern Electrical & Gas Association.

HENRY L. DOHERTY SAYS:

"NAME ME ONE RAILROAD THAT HAS NOT CREATED MORE VALUES FOR THE PUBLIC THAN FOR ITS STOCKHOLDERS. THIS ALSO APPLIES TO PUBLIC UTILITIES."

Apologies only account for that which they do not alter.—Disraeli.

ENTHUSIASM AND ACCIDENTS.

ACCIDENTS often happen through enthusiasm. Who has not been "tinkering around the house," or working on some invention, or repairing some machine, and become literally absorbed in "making it go?" So, one uses makeshift methods, drops tools where they will be in the way, slights details for future consideration, to get the job done, and has many cuts and bruises as unpleasant and perhaps dangerous souvenirs of the occasion. Many men are equally interested in their daily work and handle equipment with an amazing celerity and a gratifying display of energy. They get results, they also get occasional injuries. These men do not deserve censure, they are not careless. There is simply a conflict in their intelligence between the thoughtfulness for the risks attendant upon the work and intense concentration on the result they are seeking to achieve.

For these men we have a keen interest and a word of friendly and well-meant advice. Perhaps a constant thoughtfulness for accident prevention, when engaged in interesting work, will be contrary to the habits of half a life time, but nevertheless the senses will respond with an almost unbelievable readiness when we really try. It pays to be careful.

VIEWING THE TRENCHES.

NOW that the boys are coming home and the intense strain of anxiety has been lessened, those of us whose families have been represented at the front, and the number of such is almost uncountable, can look at a scene vividly portraying "going over the top" as we have learned to call it, without the shudder, and without the fear for our own, that during the war we could not avoid experiencing.

Therefore, the exciting scene, "Over the Top," as it is portrayed at the Hippodrome in New York, not in the form of moving pictures, but with real trenches, real men and real war surroundings, is now found a matter of intense interest, full of thrills that come with viewing such a scene, yet not with the awe that formerly crept over one at viewing the realistic production. Now that all danger is past, our American people should be sure to witness this, in order that one of the greatest features of this greatest war, may become thoroughly understood, before war-scenes have passed out of existence, and have become known only as history.

OXWELDING AND CUTTING.

ONE of the most comprehensive, helpful, and needed volumes recently published, is a manual of Instruction in Oxwelding and Cutting. There are alphabetically arranged definitions which should be known to all welders, therefore, this section of the book will be found valuable as a dictionary of terms.

The author gives a vast deal of information regarding the various phases of autogenous welding, oxy-acetylene process, etc., with a long list of equipment and parts in the construction and repair of which welding and cutting may play a large part.

There are two pages of index, including pipe-welding which is divided under sub-heads as follows: Butt-welding; Heavy tube-to-flange or pipe welding; Making 45 degree branches; Making Tees, etc., etc.

Many illustrations are shown of repaired, and welded parts of one type or another, while pages 71 and 72 are given over exclusively to pipe-welding, and therefore apply directly to the gas field. Welding of "Headers" is treated on page 111.

The work is published by the Oxweld Acelytene Company, and not a manager, or his assistants, having welding in charge, should fail of securing a copy. The way to accomplish this is to write to the Oxweld Acetylene Company, Newark, N. J., mentioning this magazine.

LOOK AFTER YOUR OWN INTEREST.

MILES STANDISH sent John Alden to ask the beautiful Priscilla to become Mrs. Standish. She hemmed and hawed and blushed prettily and finally said no, but she wouldn't mind eating breakfast with John himself every morning for forty or sixty years. So John got a marriage license for himself.

James Blaine had James Garfield make an eloquent speech nominating him for president at the Republican Convention held in Chicago some years ago, so history tells us. But the delegates hemmed and hawed and finally said no, but we'd like to have your picture on the campaign buttons. So Garfield instead of Blaine moved into the White House.

John Patterson wanted some of his salesmen to stay in the office at noon to take care of any trade that came in. One day one of the salesmen decided he'd get his stenographer to stick around for him. The stenographer did, and as luck would have it—just that noon a big customer came in and made a big purchase. And Luck hemmed and hawed and said no, I prefer to stick with you, Mr. Stenographer. So Hugh Chalmers got his start.

A sure recipe for failure is to let others do your work for you. There are things in this world you cannot delegate. Priscilla will not have it, and Success is just as finicky.

For instance—no one can do your own thinking for you—No one can do your own study for you.

When the war broke out the world's supply of dye stuff was cut off. Why? Because everybody had allowed the Germans to do all the thinking about aniline dyes.

You have to do your own thinking YOURSELF.

You can copy somebody else's answer when he gets it worked out on his slate—but that won't help you on the next problem.

We give advice, but we cannot give the wisdom to profit by it.—La Rochefoucauld.

The Auto and the Gas Field

How to get Efficient Tire Service and to Minimize Tire Depreciation While Keeping Track Thereof.

A RECORD system is most desirable in connection with the use of automobile trucks and light automobile conveyance service, one which provides for a reading of the speedometer to be entered upon a Tire-Change Card, having blanks for the car number, tire number, etc., thus to keep track of the service accomplished from the various makes of tires.

One method suggested is that two different makes should be started new on the two rear wheels, and two different makes, new, on the front wheelso f a truck, comparison being made between the two front tires, and between the two rear tires, not, however, between front and rear. One form of card in use is that which was put into service by, and is used regularly at the garage of a large institution.

TIRE CHANGE	
Speedometer Reading	Car No
OFF	ON
Wheel	Wheel
Tire No	Tire No
REASON Blow Out	FROM Running Board
Puncture	Repair Rack
Repairs	Stock Room
Adjustment	Car No Wheel
DATE	CHANGED BY

TIRE CHANGE CARD STYLE "A".

A card is made out for every new tire purchased. The tire number is entered, make, description and size is noted, and then the card is filed for use when the tire is first installed, and from that time on a record is kept whereby to know exactly what mileage is secured, how often blow-outs have occurred, how many punctures, have taken place, and what other repairs have been necessary, etc., etc.

The original tire change card remains in vogue so long as the tire is not removed from the wheel, but a new card is made out for the substitution tire, the former card acting as a memorandum for its tire though removed, up to the time it is again placed on a wheel, when a new card with its new data, but bearing the same tire number is made out, and placed on file with a former card, thus keeping tab on the tire throughout its entire life, and finally, if there be such, the adjustment is noted on the card, or a report of its junk value.

It is not difficult to note just how the card should be filled in, in order to keep a proper record, and the tire should never be removed, or changed from one wheel to another without the fact being noted on the tire-card applying to that specific tire.

We have been referring to *"Tire Change Card,"* Style "A," but now would refer to a *"Ledger Tire Card,"* Style "B," to which the memoranda from card "A" is transcribed. By this method Style "A" card becomes what in a sales office would be termed the "Journal," while card "B" acts as its name implies, as a ledger card, containing the full data collectively entered from cards "A" throughout the life of the tire.

No._____

Make	Size				Tread			
Date On	Wheel	Car No	Speedometer Reading	Date Off	Speedometer Reading	Elapsed Mileage	Total Mileage	Remarks

LEDGER TIRE CARD STYLE "B".

Location of Tires on Car No._____

Right Front	Left Front	Right Rear	Left Rear	Running-Board	

LOCATION CARD STYLE "C".

Whatever credit may come at the end of the life of a tire, whether by an adjustment, or scrap sale, should be noted on the ledger card, from the final journal card "A."

In order to keep track of a tire, Style "C" card is made out, as its blanks would indicate, thus at a glance a tire can be located, and furthermore, "Location Card," "C" aids as a check on the other record cards.

At regular intervals, all tires are invoiced, thus if the position of a tire is not as indicated on the "Location Card," it is at once apparent that the operator of the car, responsible for it, or some one without authority has made a change, omitting to record it. Furthermore, it becomes a simple matter to look up a tire noticed anywhere at a distance, on a machine, where "Location Card," "C" is used, without having to observe the number of the tire.

Facility of action comes by habit.—Timothy Titcomb.

There is, of course, great advantage, in a systematic following up of tires in an establishment where trucks are used, and where men are sometimes careless, or feel inclined to discard a tire that still has good life in it, in order to get a new one.

If the employe knows that the office is keeping tab on the tires, the influence is worth while. Furthermore, there is an excellent chance to get greater mileage out of a tire through careful handling, where a system of "tabs" is kept, and the operators of cars know that such system is kept up to date.

It requires but little time to keep up the record, but it requires watchfulness on the part of the office, or the driver will become indifferent, or may purposely omit to send in data.

It might not be a bad plan to offer a premium to drivers who accomplish more than a certain amount of mileage out of tires on cars of a certain weight, and that are used for similar purposes.

The concern using the card we illustrate, operates well on to fifty cars of various sizes, used for various purposes, and it would be simply impossible to arrive at any definite results regarding tires, or to induce care in the use of tires, or to accomplish lengthy use of tires, were it not for their employing this simple but direct method which would apply to use on the part of any gas company, whether operating few or many trucks.

The entire surface of "Tire Change Card" "A" is shown in our illustration, however, only the upper portion of "Ledger Card" "B" is shown broken away; on the original of this card there were eleven spaces in which to make necessary entries from Card "A." There were fourteen entry spaces on "Location Card" "C," but for convenience sake we are showing simply the upper section broken away. All three of these cards in their original form were the size of the regular card file card.

ACCIDENTS THAT COULD HAVE BEEN PREVENTED.

A WORKMAN placed a box of safety matches in his pocket in which were several loose matches. When he withdrew the box one of the loose matches in his pocket came in contact with the chemically coated side of the box and caused the entire box to ignite. The result was a badly burned hand.

This accident calls attention to the fact that under certain conditions the so-called safety match may become extremely dangerous. More than one serious accident has resulted from carrying loose matches in the pocket. They are especially to be feared when they are safety matches and there is something in the pockets to cause ignition.

While unloading a barrel from a truck a workman's arm was pierced and torn by a protruding nail.

The protruding nail hazard has been in the past a very common one but so many and so varied have been the warnings against it that it is gradually on the decrease. It has not disappeared, however, and great care should be exercised that it may be entirely eliminated.

A workman while wheeling bricks from an elevator ran the truck into a rake that had been put on the floor directly in the path of the truck. The collision of the truck with the rake caused the truck to overbalance and the result was that the workman sustained a broken wrist.

The importance of keeping tools in the racks provided for them cannot be exaggerated.

A workman engaged in casting a lead joint in an overhead position erected a temporary scaffolding by placing a board across the ends of two steel barrels, one of which had no head on it. He stepped on the end of the board that was over the headless barrel and it tipped downward, caused him to fall and to sustain burns about the face and neck.

No matter how slight the elevation is a stable platform or scaffolding should be used to stand on and this is especially urgent when molten metals are being used.

PAYS LARGE BILLS.

THE petroleum industry being closely allied to the gas industry of the United States is accredited by the general Liberty Loan Committee in New York with having raised $28,484,000 in contributions to the Fourth Liberty Loan. The government applied the money thus provided to the payment of certain bills incurred by the Navy Department, crediting to the petroleum industry 60 eagle class submarine chasers two destroyers, 100 six-inch naval guns, 100 three-inch naval guns, 60,000 six-inch shells, 100,000 three-inch shells, 2000 depth bombs, and 8 torpedoes.

This record, and a fact now made known, that the Germans could not operate their submarines nor their airplanes according to the schedule proposed, during the last portion of the war, through lack of petroleum and its products, while the Allies were supplied, lead to the question, Is it any wonder that the petroleum industry in this country is a little "chesty" these days?

CURE DESTRUCTION BY PRODUCTION.

THE optimist says, "The only cure for destruction is production. The only way to offset wholesale *annihilation* of world production, is to create and develop new *resources* on the same colossal scale.

"For a generation at least this stupendous program of re-creation will have to go forward at top speed. And it will set a new world-pace for all time.

'Men and women will turn out twice the work in half the time, and find a way to do it better and easier. Farmers will make two bushels of wheat grow where one grew before. Merchants will do more business and make more money on lower prices and closer margins. Everybody will work. And the industrious will earn more, save more, give more, than they ever did before.

"All this will be done because it has to be done. It is the only way to mend the broken world and hand it back to humanity decent and free.

"Get into the running now."

It is worse to apprehend than to suffer.—La Bruyere.

Team Drivers as Auto Operators

Valuable Data Collected by One Experienced in Training Auto Truck Drivers.

GEORGE M. HOWARD,
Transportation Engineer, Louisville, Ky.
Suggested as "100%" Measure.

IF anyone has any patent on selecting and training motor truck drivers we have never heard of it; at any rate, we have none. We are glad, however, to relate some of the experiences we have had.

We began studying different drivers years ago when selling motor trucks. A certain concern owned a fleet of motor trucks and was having all kinds of trouble with drivers. The drivers would speed the trucks and abuse them in every conceivable manner. Finally, it reached a point where something had to be done. As we had sold this company most of their trucks and hoped to sell them more, it was up to us to provide good drivers for them. They were operating as we remember about fifteen trucks and fifty teams.

The Superintendent of Delivery didn't like trucks very well himself, and this may have had something to do with the poor drivers. However, the General Manager of the company gave us authority to go as far as we liked, and the only provision he imposed was that of reducing the cost of operating the trucks.

After making a detail study of the whole delivery fleet trucks and teams, these are some of the facts we observed of their drivers.

The truck drivers were young men from eighteen to twenty-six years of age, had only been working for the company from one week to eight months. In each instance they had had former experience on pleasure cars and trucks, most of them pleasure car experience only They had held from two to ten different jobs in the last three years and had no one dependent on them, as a rule

On talking to these drivers we found they knew a great deal about how motor trucks should be built. Some of them wanted "cut outs," others complained that the motors were too small, and so on. They were all being paid good wages, but in each instance, they thought they should receive more money, as they were working very hard. We don't doubt but from their point of view, they were right, but they were not delivering the goods.

Now, this concern treated their employees fairly, as we found from talking to their team drivers. Most of the team drivers had been with them for a number of years

So, after talking to a number of the team drivers and observing the way they handled their teams, and from the record each of the team drivers with the company had the superintendent helped us pick out twenty team drivers as our candidates for truck drivers. They had tried this plan once before but gave it up because they were not able to teach the teamsters the knack of driving. The superintendent assured us that we would fail.

However, it never took longer than two days to teach a teamster to drive and take better care of his truck than any of the truck drivers they had. There isn't any sleight of hand or trick about teaching a wagon driver how to drive a motor truck. There are just two things necessary to teach a driver to drive and they are, knowing how yourself, and knowing you know, and the other, your subject.

Not long ago we were in the office of a superintendent going over his methods, etc., when a man applied for a position as driver. The superintendent informed him "there was nothing doing," and went on talking to us How much better it would have been if this superintendent had given him a blank to fill out in regard to his former experience, by whom employed, etc. Then, when the superintendent needed a driver he could have gone over these applications and picked out the best man. This plan, if followed, will always provide good material to pick from and will save time and trouble in selecting new men.

We should consider the experiences of the allied armies and what they have encountered in selecting and training drivers. During the first month of the war it was the custom to select men for drivers who had formerly had pleasure car experience, or who could drive. As a result a great deal of trouble was experienced in regard to accidents and mechanical troubles. Finally, the army officers decided to select good careful men and train them as drivers. As a result, comparatively little trouble is now experienced in that manner.

As a rule a motor truck displaces from two to ten wagons and as a result, there would be as many teamsters out of employment, from whom it should be no trouble to select a man careful, reliable, a hard worker and of good habits.

It isn't as hard to train a teamster to drive a truck as might be expected, if certain facts are borne in mind As a rule, the teamster is very nervous and it is as important to overcome this nervousness as it is to attempt to teach him to drive the truck. We have often taught team drivers to operate trucks who have failed, for weeks to make any progress toward learning to drive.

We are all as God made us, and oftentimes a great deal worse.—Cervantes.

If the driver is to care for his own truck we have generally found it best to go over the entire truck with him explaining all of the details, allowing him to do all of the lubrication, etc.

Next, to get as well acquainted with the driver as possible, is important. As soon as the truck is loaded and ready to start we insist on his doing all of the operations no matter how simple they may be, such as turning on the switch, setting the spark and gas levers, cranking the motor, etc. The sooner you acquaint him with all these details the sooner he will begin to rely on himself. The sooner he finds he can do these simple things the sooner he will have confidence in himself, which is vitally important if he is ever to learn to drive. Our experience has been that it does very little good to show a man how to drive; he must actually do it himself. For this reason we always allow him to take the steering wheel at once

Now, there is an old saying, that you will never learn how to dance if you look at your feet, and it is just as true when learning to run a truck. The driver must have a mental picture of what is to be done, otherwise, while he is looking down at his hands and feet, he will neglect the steering—the result being an accident.

Allow your pupil to run the truck for a mile, if necessary, in first speed, or until he has lost all of his nervousness and has perfect confidence in himself. It may be well to stop and start the truck several times, always in first speed. When stopping give him some particular object to stop at. At any event, it is vitally important for him to overcome all worry before taking up any new steps in the operation of his truck. We do not think we can emphasize too much the importance of not allowing your pupil to look down at his feet and hands. The other steps in driving can be readily taught and with very little trouble, if he has learned the first operations thoroughly.

Another point in favor of team drivers for truck drivers is that, as they know nothing of the mechanical operation of the truck, they will not be as apt to "tinker" with carburetor and ignition. The modern motor truck is so constructed that very little attention is necessary outside of lubrication and when repair or adjustment is necessary, it should be done by some one with experience not by a man receiving driver's wages. We do not mean to convey the idea that drivers should not be well paid Far from it, they should be well paid and paid for what they do.

Recently, we showed a concern where, by paying their drivers for the work they did, they were able to cut their cost of delivery in half. This concern was paying their drivers at the rate of $3.50 per day. Each truck earned $30.00. By paying their drivers additional for each ton hauled some of the drivers earned $6.00 and the truck earned $50.00 per day.

Lost time is one of the most important items in truck operation and drivers should be shown how to save every minute possible. It is not always the driver's fault, though, that time is lost. At any event, lost time should be classified and can be divided into a number of subdivisions, such as: Lost time is not completing the trip in the shortest time or in unloading. The driver may or may not be responsible for lost time in loading or unloading. These operations should be studied and conditions noted. However, as a rule, he is always responsible for not making the trip in the shortest possible time.

Another advantage in selecting team drivers is that they as a rule, know how to arrange their loads, whereas men not having any experience in cartage will have to be taught this important feature. Another advantage the teamster has is that of knowing the city or the best routes to take to a certain point; all these things would have to be taught a man not actually familiar with cartage.

If you expect to have an efficient delivery department it is vitally necessary that you have efficient drivers.

One thought we hope to impress on you, is select men that have formerly made a success at doing some one thing and stuck to it for a reasonable length of time Then, after you have trained them to be good drivers you should have no trouble in keeping them, provided you treat them right; you will have greater efficiency where it is needed the most—namely, in the human element.

WHICH SIDE ARE YOU ON?

NOTHING, perhaps does more to hold a man in the favor of an employer than his willingness to cooperate with his fellow-workers. A man often shows his caliber by his willingness to assist in working out a plan which did not originate with him, and of which he may not fully approve. It is impossible that we should all think exactly alike on all business moves. But some plan must be adopted, and when it is adopted every man and woman connected with the concern should do his or her best to make that plan work. If it doesn't work, don't let it be said that you were the stumbling block. Perhaps your plan was the better one, but there may have been good and sufficient reasons why the firm did not adopt it. In most cases it is not a question of moral right or wrong that is involved, but rather one of personal opinion. In showing a spirit of antagonism in such circumstances, a person simply demonstrates his own small-mindedness in a most ludicrous manner. —Exchange.

THREE PRODS.

You may have a reputation for starting things, but the man working next to you has a reputation for finishing things.

The manager is a man who won his position as the one who went ahead.

Wear your best manners all the time. This trying to put over good manners on special occasions shows that you are not used to wearing them.

Have a Red Cross service flag in every home, add a cross for every child.

Constructive Problems

Have You Ever Asked Yourself These Questions — Note Others' Answers.
"System" Asks and Answers.

EACH of the eight questions listed here is a common management problem. At one time or another you have doubtless sought for an answer to every one of them, as they have arisen in your relations with your employes. That's why you'll probably be specially interested in the answers to these questions, given below, by nine executives. Each executive has met at least one of the problems.

1. How can I make a future for minor employees—and make them see it?

2. How can I correctly delegate detail?

3. How can I keep my whole force on its toes?

4. How can I keep my best men straining at the leash?

5. How can I let a subordinate know his idea is wrong - without discouraging his initiative?

6. How can I judge the quantity and quality of work when it varies in kind?

7. How far does it pay to let a man make mistakes?

8. How—and when—shall I compliment an employe on good work?

How I Make a Future for Minor Employes.

Where this question is answered I believe you will usually find a growing, successful organization. Where it is still unanswered you will see a concern which is not taking full advantage of all its opportunities; that concern can't do it, for it hasn't the men capable of pushing it to the limit.

When a man comes into our business—we're not so big that we have lost the personal touch—I find out whether his purpose is to grow up with the company or just to draw his present pay. If he wants to grow up with the company I am willing to consider him further. I tell him it will take him 10 years to learn our business through and through. Women need three years to go as far as it's worth our while to teach them, and I tell them so. If the new employe comes in at all, he or she comes in on this basis.

We don't expect all these people to stay with us. But if one out of three sticks we feel well repaid.

In this way we've started in right on the first day. The new employe knows that his real value to us—his big value—cannot come until he knows the business all the way through. And he knows that if he stays until he knows the business there is a real career before him.

We put the new employe—nearly always a youngster—to work in a department with instructions to go after the department head's job. "Get so good there that I'll have to make you boss or transfer you to another department," I tell him. "That's the way we want you to go after it."

And that's exactly the way he does go after it. There have been more instances than I could count on my fingers where I have transferred a new man because, in justice to him, I should have had to put him in place of the department head had I left him there.

These new men know that I'm holding the job out before them like the traditional carrot before the donkey. They know that until they have worked well through the business they can't get the big jobs. But because they know it they are not disappointed when they are transferred.

By the time a man has been with us a few years, and has worked through several departments, he is usually worth a lot to us. And we pay him accordingly. Meanwhile, what has been the situation?

Our youngster has held a dozen or so minor jobs throughout the plant and office. He has gone at them with a snap that is lacking in a man who feels that he is permanently in one job. And because he has a future that the permanent minor employee has not, he has done better work on the job for less money. A good bookkeeper, for instance, may cost $150 a month; there is little ahead of him but bookkeeping. But the boy who came to work two years before and has been transferred three or four times since will do the same work better for $100—and for his age and experience be getting well paid, too.

In short, our method of making a future for minor employes is to have no permanent minor employes. When we want an executive we have only to reach down into our force of "minor employes," and promote him, a more able and profitable man for our business than we could possibly hire outside. And while we have been developing this executive he has been doing minor work better than we could get it done otherwise.

PAUL E. RYAN,
Assistant General Manager The Osborn Mfg. Co.

Every man in our employ knows where he stands in his department and what his future outlook is. We try to fit each man into his place in the line of promotion, and to keep that line open and moving ahead. We try also to fill all better jobs by making promotions from among our own people, and to hire only young fellows to start in at the bottom. Whenever an opening occurs, all those below the vacancy in line are moved up, but should some

particular man not show the ability to go ahead, he might be sidetracked and others advanced over him.

Ordinarily, priority of employment would determine a man's rank, but if he fails to hold up his end we insist that he must not block the line. If he is not capable of going on he is either side-tracked or asked to resign. I have in mind a clerk in one of our departments who has been with us five or six years, and is a thoroughly good clerk; but he has not a particle of executive ability. He can remain where he is, while other men will be promoted over his head, as we cannot allow him to block the line for young men of greater ability.

The same is true of some of the departments in which we employ women. We find it generally necessary to place the executive work in the hands of men. Although the women may be excellent clerks they cannot expect promotion to the executive positions except possibly in very occasional instances.

This method of establishing a line of promotion gives the beginner a chance to see what is ahead of him, and keep each man alert to hold his place in the procession. Of course, there is always the possibility that an employe who is sidetracked will quit, but if he is not good enough to hold his place in line, we are willing to have him go.

Unless a man has ability to fill the jobs ahead of him we feel that we would rather have him step out than to block the progress of those behind him. This method keeps the employes on their toes all the way down the line. When promotions occur, they see the possibilities ahead, and are more than ever anxious to make good.

JABOB D. COX, JR.,
Vice-President The Cleveland Twist Drill Company.

How I Delegate Detail.

When four years ago, I was thrown into the management of a large mercantile organization without warning and without commercial experience—I had been a mining engineer—I felt that to learn the business I must first become thoroughly familiar with all the details. So, in spite of my knowledge that executive work should not include detail, I handled everything I could until I felt that I was beginning to know something about merchandising.

As soon as possible I trained each of the other employes to take some responsibility. Each person was assigned specific duties.

We next wrote down each job and the time it should take. This enabled us to schedule the work in the most effective way, and to keep everyone busy. Standard practice books helped me to pass on the detail to others.

Once rid of the mechanical detail of running the business I set about shedding executive detail. And now I have succeeded at this fairly well because of a profit-sharing plan. Each store manager in our concern is now working on an arrangement by which he gets, each quarter, one half the gain in net profit over a three months' period selected from 1917.

It has been costing us a lot of money for supervision, but this plan is helping to reduce this expense. It causes the men to do a little thinking for themselves, and makes them carry out instructions carefully and quickly. We are sure that it has successfully shifted supervisory detail downward. And that, after all, is the hardest kind of detail for the executive to pass on, I have found.

N. C. GROCH,
General Manager, The Matthew Smith Tea, Coffee, and Grocery Company.

How I Keep My Whole Force on its Toes.

Punctuality and regularity of attendance may often be taken as a valuable indication of an employe's interest in his job and in his employer. And if good attendance is stimulated, it reacts to cause greater interest, I believe. With this in mind we try to make sure of good attendance.

Instead of penalizing employes for being absent or late, we reward them for being present or on time. Our bonus plan for constant attendance, punctuality, and effectiveness as originally put into effect provided for a payment of 2 per cent. of his salary to any employe who had no absences over a period of six months, with 1 per cent. additional if the record showed no tardiness, and 2 per cent. for effectiveness as shown by the unit cost of his output.

On January 1, 1918, however, we changed the plan to put the attendance and punctuality on a monthly basis, instead of requiring a perfect record for the six months' period. Under the old plan, when an employe's record was once broken there was less stimulus for him to keep it up to the mark for the rest of the period. Now when the record is broken for one month, there is still just as good a chance to make a perfect record in the future.

For the six months during which the old plan was in effect, 53 employes out of 67 who were eligible qualified in one class or the other, but only 30 made a perfect record for both attendance and punctuality. We expect that record to be improved considerably under the new plan.

The bonus now is figured each month on the employe's record for the previous calendar month. A perfect record for attendance and punctuality during one calendar month entitles him to a bonus of 1 per cent. of his salary for that month. A perfect record for two months or more entitles him to a bonus of 2 per cent. He continues to receive 2 per cent. bonus each month until his good record is broken.

The general effectiveness of employes' work, as shown by the unit cost of production, we can hardly figure accurately by the month. This bonus we still pay at the end of each six months. Any saving in the cost of doing business up to 3 per cent. of the total salaries paid during the previous six months we divide among the employes, share and share alike. If the saving amounts to more than 3 per cent., the company gets the next 3 per cent. Any saving beyond 6 per cent. the employes and the company divide.

The saving we determine at the end of the season by figuring the total number of transactions handled, at the average cost of the three previous years. If the expense for the current season is less than this, the difference represents the saving. To be eligible for the bonus an employe must have been on the payroll for at least two full

There is no good in arguing with the inevitable.—Lowell.

months during the season, and must still be on the payroll at the end of the season.

To keep this side of the bonus plan prominently before the workers at all times, a chart four feet by six has been placed where all can see it, comparing the unit cost by months for an average of the last three years with the present year. Vertical columns show the months and a zigzag red line, dipping toward the bottom of the chart for a decrease in the unit cost for any month and rising for an increase, shows the three-year average. A similar black line showing the cost for this year is marked up immediately after the close of each half month, so that the employes can tell at a glance how the present season compares with the previous three-year average.

The game is to keep the black line below the red line. Whenever it goes below the employes get the first benefit, under the bonus system, and that of course increases their interest in the business.

R. T. RICHARDSON,
Secretary, O. W. Richardson & Company.

How I Keep My Best Men Straining at the Leash .

For a long while we searched for the best way to keep our highest grade employes reaching out after more work, and after the opportunity to do better work. I believe that the plan we use now has met the difficulty to everyone's satisfaction.

Our means has been a certificate which we issue to some of our highest grade men—department heads and others in responsible positions. This certificate is issued in denominations of $100 and upward, just like our capital stock. It has no value, however, except to the owner. as it is not transferable. It entitles the holder to a sum of money equal to the earnings on stock of that value, and runs for one year.

The whole secret of the method's success is that the certificate runs for one year. It is revocable by the board of directors for cause, but we have never yet had good reason to call one in.

When a department shows a good gain for the year the man at the head knows that he will receive his full proportion of the earnings of the company, and that he is likely to receive a few certificates more than he had before. If his department has not progressed he may have fewer issued than last year. He is kept on his mettle all the time, for he feels that as far as earnings go he is a stockholder. The plan has worked out well for employe and employer.

GEORGE B. LOGAN,
President, Logan-Gregg Hardware Company.

How I Let a Subordinate Know His Suggestion is Wrong.

If an employe comes to me bubbling over with an idea which I am convinced will not be practical, at the beginning I am just as enthusiastic as he is. I tell him that I am impressed with the idea, but that I want to take time to look into it further. That gives me a chance, at our next discussion, to tell him that his main idea is all right, but to show him some point where it will not work well, or some other method that is better.

Since he feels I am in sympathy with him I probably can make him see his error; if I had come out flatly at first and told him it was all wrong, he might have felt that he was not being given a square deal. He would probably have been discouraged so far that he would not submit any further ideas, although his next suggestion might be one of real value.

A. D. SAUNDERS, JR.,
Manager, Three Star Slide Company.

How I Judge the Quantity and Quality of Work.

Our organization is sometimes classed as big; we have about 1,200 employes. But it isn't too big for me to be acquainted with nearly every employe in it. I consider that one of the most important parts of my job. And I know pretty well just how every one of those employes is getting along.

Whether or not we admit it, we all judge the value of employes, and their work, by using someone else as a yardstick. When we pay Williamson $22 a week it is usually because we figure his value as between that of Jarvis, who draws $20, and Sheridan, who gets $25. I believe that the process is unconscious in most instances; still, it is the process we use.

Every man in executive work is constantly weighing his employes by this method. And when an employe's work varies in kind the man directly over him can nearly always tell just about what he is worth. We take advantage of this by means of a systematic routine.

When an employe comes into our organization a card with his name and department goes into my tickler file three months ahead. When it comes up my secretary sends it to the department manager or foreman for progress information. The department head's judgment of the man—no matter how difficult it is to separate into standardized parts—is likely to be accurate.

The employe's name then goes into our file and goes out to the departmental executive on January 1 and, in some instances on July 1. Before it goes out we rubber stamp it with a form on which are listed in a column: ability, accuracy, discipline, education, neatness, promptness, reliability. Across the top are four other columns, blank below, headed: very good, good, medium, and poor. The department head makes seven checkmarks to give his opinion of the employe's value.

Along entirely different lines is our aim to put the whole organization on piece work rates or bonuses. And I believe that eventually we shall succeed in putting most of our employes on that basis.

I believe that with careful study you can put almost any job on a fair piecework rate. But it takes study. I have collected figures for as long as three years on some jobs before I have felt able to install either a piece rate or a bonus.

My idea in brief, is that while work may vary widely in kind there are usually two—perhaps three or four—tendencies which check against each other. By taking them all into consideration and using them as arithmetical factors, a formula is usually obtainable. Perhaps an example out of our experience will make this clear.

A work of real merit finds favor at last.—Alcott.

In our packing department one shipment may consist of boxing two tea-kettles; the next may be filling a case with several hundred items. Again, a dealer may buy a dozen pocket-knives, which weigh two or three pounds, or he may order two dozen flatirons which weigh 200. It seemed almost impossible to get a fair price rate here. One man might select—as often as he could—small jobs which require great care; another might specialize on heavy jobs.

After collecting information for a long while I worked out a bonus method that has increased the pay of our packers an average of 10 per cent. or 15 per cent. And it has cut down our packing force a good deal more than that. We do not tell the men the rate we pay, for if we did they could "beat" it; they know, simply, that we keep a record of the work they do, and that if they work hard all week there's likely to be $2 or $4 extra in the envelope on Saturday. This is perhaps not the best plan for common practice—men like to know what their bonus is so they can figure it for themselves and try to increase it—but in this instance the conditions were unusual.

Our investigation showed us that if a man packed a large number of boxes, his tonnage usually was low. If, on the other hand, he packed a small number, his tonnage was likely to be high. Sometimes, however, a favorable combination would give a man a good figure in both. That man, the foreman would usually tell us, was above the average in ability.

Now we figure each box that a man packs at a given rate. For every ton over a specified tonnage, we credit him with an extra bonus. We figure this on every man every week. If his earnings at this rate fall consistently below his wages, we drop him. If his earnings rise above his wages, we split the difference with him.

That example is, I feel, typical. I believe that if an executive collects information long enough, and then takes the various influences into consideration, he can work out an arithmetical formula by which he can judge the output of the great majority of workers employed to do irregular jobs.

C. J. WHIPPLE,
General Manager, Hibbard, Spencer, Bartlett & Co.

How Far it Pays Me to Let a Man Make Mistakes.

The mistakes which a man can make without becoming an unprofitable employe must be appraised in each instance with reference to all the circumstances. That at least has been my experience.

If the employe seems capable, but makes a lot of errors I usually incline to the belief that he is misplaced. Then it is up to me to see that he is shifted to a department where he can make good. I am slow to let any man go. If he is doing his best, I prefer to work with him and try to bring out his ability.

Not long ago a boy went to work in our cashier's office. I had known him for a long time. I knew he was absolutely honest, and eager to make good, but he was continually in hot water because of errors. Anyone could see, however, that the mistakes he made were caused by his anxiety to turn out work too fast.

I warned the youngster that carelessness never pays. I advised him, too, to attend night school to improve his very poor handwriting. He took my advice and his work is getting more satisfactory every day. I am sure that he will make a good employe soon.

In another instance a girl who had been employed to take the place of an enlisted man was getting badly behind with her work. I asked her about it and she told me that her slowness was caused by her lack of acquaintance with the names she had to handle. She was willing to stay on Saturday afternoons, however, and work while the others had their half holiday. In fact, in an effort to catch up she had been doing that very thing. She hasn't quite caught up yet, but the spirit she showed made me decide to keep her.

I think that these two instances are typical of my method of handling the employes who make errors. I generally try to see all their good points. It's easy enough to see their faults.

GEORGE R. LINN,

How—and When—I Compliment an Employe on Good Work.

The condition we have to fight hardest in our efforts to keep men on their toes is the mental slump to which nearly everyone is subject. These moments of mental uncertainty are dangerous pitfalls in industrial organization, and the constant problem is to avoid them.

This we try to accomplish by keeping all our men mentally alert all the time. If one man begins to doubt his possibility of growth, advancement, and development in the organization, a little ulcer has been formed which interferes greatly with the general spirit of the whole concern. One of the very best ways in the world to maintain this alertness I have found, is to let men understand that I am interested in what they are doing; that I am awake to results accomplished and am willing to reward them for valuable and faithful service.

One of the greatest discouragements a good man can get is the feeling that something really worth while which he has done has passed unnoticed by his chief, or has been treated as trivial. We try, therefore, to avoid making that mistake.

"A kind word at the right time is often worth more than gold," strikes me as a mighty good working motto. It is recognition of merit—of results accomplished—that keeps men on their toes. It inspires in the good employee the desire to get ahead.

I remember one time when I set one of our department heads at a task which involved conscientious investigation and lots of hard work. On the date the report was due he came to my office with his written report. Before handing it to me he said, in effect, "I've gone over this from every angle, and I know conditions accurately. I recommend that we do so-and-so."

I knew that man was reliable, and I knew that his recommendation was sound. "All right," I said. "We'll do that. And send your report to the files, will you? I'm satisfied by what you've told me that you're absolutely right."

It was several months later that the first mention of that happening came to me from someone else. Then another department head told me that the other man had carried it to him. "That surely makes me feel the

It is by presence of mind in untried emergencies that the native metal of a man is tested.—Lowell.

chief is on the square," he had said. "I'll certainly do my best for a man like that." And his work had shown it, too, over the whole period.

A grave danger, however, comes in complimenting a man too much, or to an extent that justifies him in believing you should pay him more than he is worth. Words are poor, indeed, if they do not result in material recognition. The best form of material recognition is increasing the man's salary check.

W. A. CURTIS
Vice-President and General Manager
Montgomery Ward and Company.

WAR CRIPPLES.

A WRITER for the "Ambassador" touched upon the fellows who will return from the front, crippled. What he had to say was so excellent that we are constrained to ask the same questions, namely:

"What are we going to do with the one-armed, one-legged, one-eyed men when they come back from the war? How are they to live and be supported?" The writer says:

"This subject is at the present time giving some of our able thinkers quite a little concern, but as they consider it seriously they see light in the thought that men who use their faculties to the best advantage can get along with much less than many suppose.

"I remember seeing an armless man once do a number of stunts with his toes and most of them he did better than many men could do them with their hands.

"There is an armless billiard player who plays balk line better than the American amateur champion.

"There is an armless golfer who scores as well as most professionals and much better than most amateurs.

"All of which seems to indicate that a man can get along without almost any part of his body excepting his head if he uses that to advantage.

"So it may not be as bad for the cripples after all if they are given an opportunity and have the desire to think.

"But how about the fellows who are not cripples, who have not been to war—who have done their bit at home—who have worked through days of chance to achieve and have made no progress—what are we going to do with them? Are we going to help them or are we going to leave them in the trenches in which they're mired?

"It seems to me now is the time for every employer to look over his organization and analyze his employees to determine whether their positions cannot be bettered. He would better do this, not only because of interest in his employees, but because of self interest.

"Labor and capital must get closer together—must know each other better—must be prepared to work out the problems together. Labor must be shown that capital is interested in its welfare for reasons other than mere profitable return.

"A warehouse man employing twelve men on a floor, lost a floor foreman, called to the colors. The first questin was, who shall have the foreman's job, and the additional five dollars a week the foreman's job paid.

"There's Burns," said the boss. "He's been with us for ten years. Why not advance him?"

" 'Can't be done,' " said the superintendent. 'Burns would have them all by the ears in no time. It's hard enough to keep him in his place now, but give him a little authority and he'd override the entire organization.' "

"Too bad, isn't it? Here's a good man, a capable man; the chance comes and because he has certain characteristics, or the superintendent thinks he has, he is "passed up" when there is a chance for advancement.

"I happened to be in on the conference, so I asked the superintendent, 'Did you ever tell Burns what his real fault is?'

" 'Oh, yes,' " he replied, " 'we've told him a number of times that he talked too much.'

" 'But did you ever give it to him in dollars and cents?' I asked. 'Did you ever talk to him in words that appeal? Don't you suppose that if he knew a loose tongue was costing him five dollars a week he might put on the soft pedal?'

" 'Five dollars' fine," said the judge to the man who talked back, and when he talked on the judge said 'ten' and 'fifteen' and by the time he'd gotten to 'twenty-five' the man had stopped talking. The idea finally got to him and he realized that what he had to say wasn't worth what it cost him to say it.

"Now it seems to me that if when the superintendent first realized that Burns had all the earmarks of a good foreman except speech regulation, if he had taken Burns off once a week or once a month and told him just how his failing was holding him back, that Burns might have changed.

"A month ago I was talking to a successful manufacturer of pianos. 'Two years ago,' he said, 'I was building pianos. I was building good pianos and I was making money—as much money as any man is entitled to make. One day I was going through the shop and I stood for a minute watching a man who had been with me for a number of years. He was doing about the same kind of work he had been doing for five years and doing it in about the same way and the thought came to me, is Jack getting all out of himself that he can, and then and there I decided to try to build men.

" 'For twenty-four months I've been building men, and I've had more real satisfaction out of my business than at any time since I started it.

" 'I'm making better pianos than I did two years ago. I'm making more money. My men are making more money. They're better workmen, and they're better satisfied?'

"All of which seems to indicate that there is an angle of approach that may be studied to advantage.

"And while we are considering what is to become of war cripples, let us give a little thought to the cripples at home."

They that will not be counselled cannot be helped.—Benjamin Franklin.

OFFICE MEMORANDUMS.

QUITE recently we dropped into the office of one of the leading manufacturing concerns in an eastern city, there in the middle of an office occupied by many people, was a Dictaphone. While we sat talking matters of business, I kept my eye on this instrument of time-saving. I saw one and another of the employes of the office go to the Dictaphone, and picking up the mouthpiece, say a few words, then hanging up the mouthpiece, pass on to other matters in hand.

I became so interested and at the same time so curious to know what this all meant, that I made inquiry, and found that memorandums were being dictated to the instrument. For instance, Mr. "A" wanted a memorandum to reach Mr. "F." Instead of going to Mr. "F.'s" desk and perhaps failing to znd him, thus losing valuable time, it was found that the Dictaphone memo was a far better way. Mr. "A" spoke into the Dictaphone the words, *"Memorandum, Mr. 'F' from Mr. 'A.' It is important that the shipment of rods to John Doe & Company should catch tonight's freight. Promise has been made."*

Mr. "B" I heard dictate a memorandum to be placed in the "tickler" for himself, to come to his desk several days later, while others dictated memorandums to others of the establishment, etc., etc.

At the conclusion of each hour in the day, a typist stepped to the Dictaphone, removed the record, ran off the memorandums on separate slips. These were delivered then by office-boy to the different desks named in the memorandums, or to the filing clerk having in hand the "tickler" system of the office, as the case might be.

There are many ways by which this system could be made effective in a plant where communications must pass from operating departments to various desks in the office, or from office desks to manufacturing departments, and between desks, as we have noted.

Imagine the time saved by this method, over that of verbally transmitting memorandums, or writing memorandums by hand on the part of those whose day's schedule of work is already sufficient for eleven hours, but is crowded into eight. Furthermore, written memos are surer than verbal ones.

Possibly the reader may have known the Dictaphone only as a device for the transmitting of correspondence through the voice and record from writter to typist. To such the foregoing is a suggestion along another line. The thought may be helpful to some of our readers who are conducting large offices and important manufacturing plants.

If a Dictaphone is used in the office of the superintendent of a plant, whereby to transmit matter to desks in the general office, and shipping department, the records are taken from the Dictaphone to the transcriber's desk in the general office, thus many memorandums are conveyed at one time, rather than many memorandums being carried from the superintendent's office by many trips. In addition, this plan keeps the general office in *surer* touch with the departments in the factory, than through means frequently in vogue.

THE KITE MUST HAVE JUST ENOUGH TAIL TO FLY.

IN the days of boyhood we learned that too little or too much tail to a kite was the forerunner of disaster to that world-widely known Benjamin Franklin flying machine, and men, like the kite, must have just enough work to keep him in good trim. He who overworks is like the kite with too long a tail, while he who underworks is like the kite with too short a tail.

What people need, is in their every day matters to keep both mind and body normally active. It is a known fact that men who have been active in business, and who give up their business interests along in life, frequently live but a short while thereafter, indicating that business activity is good for all. Let's, therefore, not seek out the inactive jobs, but instead, those that, if you please, demand and force activity.

The athlete soon loses his agility, and ability to maintain his record, if he lets-up on constant exercise. Just so the man who falls into idle ways in business, or the shop, or whose mind is set on getting out of as much as possible of that which requires activity on his part, is sure to find the pendulum of his life shortening in its swing. "Keeping everlastingly at it brings success." This same applies to business conduct, and to advertising as an important factor in such conduct. *Don't let up*—"Out of sight, out of mind," and "out of mind" when the buyer is ordering, spells eventually *out of business.*

GRADE "19."

The B. F. Goodrich Rubber Company is not showing favoritism, but on the square are seeking to serve the natural gas and gasoline industry with a gasoline-resisting rubber called Grade "19" for couplings. The letterhead of the Rubber Company pictures the four forms of rubber couplings for the four standard types of couplings, namely, Dresser, Dayton, Hammond and Custer, giving each equal prominence with the others.

The point with the Goodrich Company is, best of service to the industry, and square deal to the four manufacturers of couplings. Goodrich Grade "19" is, we are informed, now being used by many gas companies, among which are the following:

The East Ohio Gas Company, The Manufacturers Heat & Light Company, West Virginia & Maryland Gas Company, Louisiana Gas Company, Lone Star Gas Company, Oklahoma Natural Gas Company, Iroquois Natural Gas Company, Southwestern Gas & Electric Company, Ohio Fuel Supply Company, Hope Natural Gas Company.

Apology is only egotism wrong side out.—Holmes.

THE WORLD'S GREAT INVENTIONS.

FOLLOWING is given a fair list of the world's greatest inventions and who made them. This list covers the great majority of great inventions; that is, those inventions that have revolutionized the world; and it is suggested that this list be kept for future reference.

The steam engine has been called the greatest of inventions. It broke the shackles from slaves. It mingled the marts of the world. It made neighbors of the antipodes. Newcomen, a native of Devonshire, obtained the patent for the first partially successful steam engine; Watt, a Scotchman, perfected it; Cuynot. Murdock and Trevitick brought forward the locomotive; Stephenson, an Englishman, was the first to apply the locomotive steam engine to railways for passenger traffic; France, England, and America applied it to navigation.

The telegraph, which brings us the daily history of the world, was invented by an American, Professor Morse, who also suggested the Atlantic cable, which was subsequently laid by that American merchant-scientist, Cyrus Field, assisted in "mooring the New World alongside the Old" by Lord Kelvin, the prince of physicists. Graham Bell, the chief inventor of the telephone, was born in Scotland and grew to fame in America. A young Italian, Marconi, gave wireless telegraphy to the world.

Cyrus McCormick, a native of West Virginia, produced the reaping machine, which harvests the food of the world. Meikle, of England, brought forth the threshing machine; thus was famine banished. Eli Whitney, of Massachussetts parentage, invented the cotton gin; Hargreaves made the spinning jenny; Arkwright supplied its efficiency with his famous spinning frame; Kay introduced the fly shuttle in weaving. Brunel, who devised the knitting machine, and Cartwright, inventor of the power loom, were British citizens. Thus was the world clothed.

Daguerre, a Frenchman, presented us with photography. Our own Edison brought forth the motion picture to delight and instruct the eye and the phonograph to please and teach the ear.

By the use of the compound microscope, Pasteur, the French biologist, as early as 1857, demonstrated a connection between microscopic organisms and disease. Edward Jenner, the discoverer of vaccination, and Harvey, the discoverer of the circulation of the blood, were Englishmen. An American taught the world the use of anaesthetics. Our dentists excel all others. They are employed by many crowned heads.

The French cut the Suez Canal, and the Americans joined the Atlantic and the Pacific at Panama.

The decimal or metric system is a gift from France.

The method by which we make our steel is that of Sir Henry Bessemer.

Many of the fruits and vegetables, of which we eat an enormous quantity, were brought forth by our own peerless Burbank.

Lavoisier, the father of modern chemistry, was a Frenchman. Linnaeus, the founder of botany, was of Swedish origin. To Hutton, of England, we are indebted for geology; to Maury, of Virginia, for the physiography of the sea; to Descartes, of French parentage, for analytical geometry; to Comte, of France, for sociology.

UNCLE SAM AN EDUCATOR.

NOT only has a Bureau of Education been established by the United States Government at Washington, whereby to extend the work of our national government into the general fields of the public school and higher educational institutions, but the Administration has been and is conducting specialized courses in some of our leading educational institutions for instructing in "employment management," and invites employers of labor to suggest men and women from their own organizations as candilates for this course, the idea being to so educate employment managers as to make them competent to employ and place individuals in positions they are best fitted to fill.

In other words, each man should be hired to do the thing he is best fitted to do. We have passed the age of inefficiency, and have merged from a periol of war, requiring the most extreme efficiency known in the matter of war conduuct, the handling of men, the handling of equipment, etc., into a period of efficiency in peace-time methods, producing of products, use of time, etc., etc. There must be no square pegs in round holes.

The introduction of the employment manager into industry, and the standard of services of an employment department, is acknowledged to be one of the greatest movements now taking place in the manufacturing industry of this country. Courses are being conducted at Harvard, in co-operation with the Massachusetts Institute of Technology, Boston University, in Boston; Columbia University, New York; University of Rochester, Rochester, N. Y.; Carnegie Institute of Technology, and the University of Pittsburgh, Pittsburgh, Pa.; University of Washington, Seattle; and the University of California at Berkeley.

The courses of instruction in the various schools run from six weeks to two months, and the classes are conducted by the foremost authorities in the country on the various subjects covered.

The materials presented on the subject of employment management covers the organization and equipment of an employment department, the employing of the workers, the training of the workers, the payment of the workers, the control of working conditions, effects to keep the work up to standard, and the government of the shop. There are no charges for the course, except the outlay for living expenses of students and about $15.00 for books and supplies. It has been arranged to begin new classes as soon as each previous class is graduated so application for admission to the courses in any of the above named schools may be made at any time by addressing Captain Boyd Fisher, 717 Thirteenth Street, N. W., Washington, D. C.

If a man is worth knowing at all, he is worth knowing well.—Alexander Smith.

Government Recommendations

To Effect a Saving of Natural Gas in Carbon Black Manufacture Where Necessary to Meet Domestic Shortages.

The following official communication is published by request of the United States Fuel Administration and careful consideration of those matters brought to the fore is urged.—Editor's note.

THE coming winter will witness probably the greatest shortage in natural gas for domestic purposes that has ever existed, due to the enormously increased demands made upon the natural gas industry by the war and on account of a possible coal shortage which has diverted coal users to the use of gas as fuel. Every possible means is being adopted by the United States Fuel Administation to effect a saving of this commodity for domestic consumption at every point possible along the lines of supply by eliminating wastes and unnecessary expenditure.

Appeals have been made to the Fuel Administration by representatives of a number of communities to curtail the use of natural gas in certain lines of industry so that there will be a sufficient supply to meet domestic requirements during cold weather. Most of these communities obtain their supply of natural gas from the West Virginia fields and in this section there is a considerable quantity of gas being used in the manufacture of carbon black which commodity constitutes one of the largest single drains upon the gas fields.

The Fuel Administration takes the position that where natural gas is available for domestic and industrial purposes its unrestricted use in the manufacture of carbon black is regarded as a wasteful practice. Owners of some of the carbon black plants, recognizing the need for conservation, have shown a willingness to co-operate with the Fuel Administration and have voluntarily agreed to curtail the use of natural gas. A saving of approximately $15,000 worth of gas per day has been made by their voluntary action.

There are instances, however, where gas wells are so remote from public utility lines and from manufacturing plants that it is practically and economically impossible to utilize the gas for any other purpose and these plants are not considered wasteful of natural gas in using it for the manufacture of carbon black. The Fuel Administration is not unmindful of the fact that gas, now unavailable on account of isolated conditions or low pressures, may be and probably will be used in the near future for domestic purposes as is being done in the old Indiana field.

In the American trade the term "lamp black" is usually understood to be a soot deposited by smudge processes and made from oil, rosin, or some other solder or raw material, whereas carbon black is a term applied to a material deposited by the actual contact of a flame upon a metallic surface. Carbon black is now made by the wasteful process of incomplete combustion of natural gas, that is the gas is simply burned in the open and the flame impinging against a metal plate making the deposit known as carbon black. From 1⅛ to 1½ lbs. of carbon black are made from every 1,000 cubic feet of gas burned. This is a very considerable waste of gas and utilizes only a small percentage of the carbon content of the gas.

The total quantity of natural gas used for carbon black in West Virginia manufacture is more than 26,000,000,000 cubic feet annually. This amounts to about ten times as much gas as was used in the city of Louisville, or the equivalent of ⅛ of the domestic natural gas consumption in the United States. It has been proved by experts in industrial research that with correctly designed appliances the yield of carbon black can be made three times as high as that usually obtained by the wasteful process of incomplete combustion and in addition thereto to save a usable commercial gas.

Following are reasons why the manufacture of carbon black may be more attractive than use of natural gas for public utility service.

1. **No transmission lines necessary**—The plants are located in the fields close to the leases, and sometimes on the leases themselves, so that the ordinary gathering lines are the only transmission equipment necessary, and these are so short as to not even require the use of gas compressors. This, of course, makes a marked difference in leakage, due to short lines, as well as installation cost.

2. **Uniform load**—A natural gas plant operating as a public utility can use its total equipment only about one-third of the time. That is, it has a load factor of only about 34 per cent. The carbon plant load is uniform every hour in the day and for every day in the year. With the same wells and gathering line equipment it can, therefore, handle approximately three times as much gas as it could if it were selling its gas to the public as a public utility service.

3. **The proximity of the carbon plants to the wells**, with the resulting short lines, make it possible to carry

Strong reasons make strong actions.—Shakespeare.

lower well pressure than can ordinarily even be reached by contiguous public utility companies having their wells discharge into lines to compressor stations. This, in most cases, gives the carbon plant the advantage in pressure over the adjacent competing public utility plant.

4. In a number of instances carbon plants have been located where it would not be feasible, with present prices for natural gas, to lay lines in order to transmit the gas into the public utility transmission system.

5. The carbon black plants do not carry reserve acreage, as a general rule, and this lowers the capital necessary for the enterprise.

6. The plant hazards are much less than those in a public utility plant.

7. The investment necessary for each 1,000 cubic feet of natural gas handled will be about ten times larger in a public utility plant, as explained in further detail in the next section.

Small capital in carbon black plant as compared to public utility plant. It is not ordinarily appreciated that the investment necessary to render natural gas service is very much greater per consumer than for any other utility service. That is, the investment per consumer in natural gas properties, from gas leases to domestic meters, is:

1. 300 per cent. more than in electric plants, thus requiring $4.00 investment in natural gas plants to $1.00 in electric plants for each consumer.

2. 150 per cent. more than in water works plants, thus requiring $2.50 investment in natural gas plants to $1.00 in water works plants for each consumer.

3. 100 per cent. more than all of the Bell Telephone Toll Lines and Bell Exchanges in the United States, thus requiring $2.00 investment in natural gas plants to $1.00 telephones for each consumer.

4. 50 per cent. more than in ordinary manufacturing gas plants, thus requiring $1.50 investment in natural gas plants to $1.00 in manufacturing plants for each consumer.

The investment, from reserve acreage to domestic consumer's meters, in a natural gas plant rendering public utility service and selling on an average of 100 M. cubic feet of natural gas per domestic consumer per annum, will be about $220.00 per consumer, or $2.20 per M. cubic feet of gas delivered per annum.

The investment in a carbon black plant per M cubic feet of natural gas that may be used per annum, taking into account all of the favorable factors enumerated in the preceding section, will be only 20c per M cubic feet.

This is an unappreciated factor that must be reckoned with in future natural gas service standards.

SIMPLE, BUT UNEXPECTED.

"So you sent a dollar for that advertised appliance to keep your gas bills down. What did they send you?"

"A paperweight."

CHECKING NATURAL GAS WASTE.

E. A. SPENCER, JR., field inspector of oil and gas of the Appalachian conservation division of the United State Fuel Administration, who has spent more than two months past in West Virginia, states that the oil output in West Virginia is being conducted with very little waste, while that of natural gas has a wastage of more than 200,000,000 cubic feet daily.

"The natural gas waste," said Mr. Spencer, "is because of leakage in transportation lines, open-flow wells, blow-drips in the lines and carelessness of workmen. At least one-third of the loss is from the open-flow wells, there being no disposition on the part of the owners to save their gas by plugging the flow and, there being no gas-line connections with such wells, the owners are only interested in saving their oil, their wells being connected with oil lines and oil selling around $4 a barrel.

"These open-flow wells are largely in remote districts which cannot be reached with gas lines economically. The rest of the enormous waste of natural gas is in the manufacture of gasoline by the compression process, whereby at least 50 per cent of the gas is lost. The rest of the wastage comes from blowing the water drippings from the gas lines, leakage of lines and carelessness of workmen.

"The conservation division of the fuel administration has been conducting an educational conservation campaign in West Virginia for several months with good results. It is teaching gas conservation in schools and by circulating gas-conservation literature. In West Virginia there are many consumers who get their gas free and it is those people to whom the fuel administration is appealing strongest for conservation. This educational campaign, it is estimated, has resulted in the conservation of at least 25,000,000 cubic feet of natural gas daily."

Mr. Spencer said the oil and gas conservation division of the United States Fuel Administration will be preserved after its parent body has been disbanded, it being the intention of the Government to connect the oil and gas division permanently with that of the United States Bureau of Mines.

THREE STORIES.

DID you ever see the fuss a chicken makes immediately after its head is cut off? It's dead but it doesn't realize it.

The sailors were served with soup in a restaurant. One turned to the other and said: "Bill, we have been sailing on soup all our lives and never realized it."

An Irishman agreed to quit fighting with his adversary when the other man said *sufficient*. After some vigorous pummeling the Irishman's opponent had enough but forgot the word. So he continued the fight and finally the Irishman gave up. Twenty minutes before he had the other man licked but didn't realize it.

We ask advice, but we mean approbation.—Colton.

AROUND THE BELT

New Wells, New Pipe Lines, New Contracts, Additions and Extensions. A Fund of Valuable News Gathered for the Journal Through Many Sources.

TRADE PERSONALS

BISHOP, T. K., is Manager of the Wyoming Gas Company, whose plant was recently completed and is now supplying Basin and Greybull, Wyo.

CALDWELL, WALLACE L., formerly Chemist for the Pittsburgh Gas Testing Company, Pittsburgh, Pa., recently accepted appointment as City Gas Inspector, Birmingham, Ala.

NELSON, OSCAR, at the annual meeting of the stockholders of the Monroe Gas Company, Monroe, La., was elected Vice-President of the concern.

JONES, B. Ross, has been appointed manager of the Doherty oil properties in Mexico, succeeding Fred V. Burns, resigned. Mr. Johnson's headquarters will be at Tampico. For the last three years he has been with the land and leasehold department of the Empire Gas & Fuel Company, covering Southern Texas.

HANCOCK, K. M., is Superintendent of the Orleans Oil & Gas Corporation, which has been incorporated to do business in New Orleans, La.

ST. CLAIR, STUART, geologist, of Winchester, Ky., is engaged at present in investigation work at Bartlesville, Okla., for the Treasury Department. The work undertaken relates to the oil and gas production of the State of Oklahoma.

TARBELL, SWIFT, of the staff of the Prairie Oil & Gas Company, Tulsa, Okla., who has been in France with the Y. M. C. A., is reported to be on his way home from overseas. He will take up his former duties with the Prairie Company upon his return.

WEAKS, GEORGE G., has been elected President of the Monroe Gas Company, Monroe, Louisiana.

WICKETT, F. H., of Chicago, has been elected President of the Orleans Oil & Gas Corporation recently formed in New Orleans, La.

DECEASED

GROSS, PHILIP C., of the staff of the Empire Gas & Fuel Company, Bartlesville, Okla., and who later entered the service, died at Fort Williams recently.

WALSH, HUGH F., Field Foreman of the Manufacturer's Light & Heat Company, Hundred, West Va., recently succumbed to an attack of Spanish influenza.

PER CUBIC FOOT—RATES

INDIANA—Middletown

The Middletown Gas Company has advanced its rates 25 cents per thousand, bringing the price for natural gas up to $1.25 per thousand for the first 2,000 feet, and 75 cents beyond that amount.

KANSAS—Fredonia

The Fredonia Gas Company has secured permission to increase its rate to domestic consumers to 50 cents per thousand, less 10 cents for prompt payment of bills.

Topeka

Under an order of the U. S. District Court, rates for natural gas in Missouri and Kansas have been increased 80 cents per thousand in cities where 60 cents per thousand was charged previously, and to 70 cents where a rate of 50 cents was in operation. The Kansas Natural Gas Company, it has also been ruled, is to receive 40 instead of 57½ per cent. of its income, and the distributing companies will receive 60 instead of 42%.

NEW YORK—Corning

The Crystal City Gas Company has adopted a straight line meter rate for natural gas for fuel, light and power reduced from 58 cents to 45 cents per M cubic feet. Minimum monthly charge reduced from $1.16 (2,000 cu. ft.) to 45 cents (1,000 cu. ft.), subject to prompt payment discount. Prompt payment discount reduced from 5.5 cents to 5 cents per M cu. ft.

Pulaski

The Pulaski Gas & Oil Company has changed its basis for charges from step rates as follows: 62.5 cents per cubic feet for less than 40,000 cugic feet per month; 50 cents per M cubic feet for 40,000 to 80,000 cubic feet and 40 cents per M cubic feet for 80,000 cubic feet or more to flat rate of 77c per M cubic feet. Effective December 1, 1918.

OHIO—Marietta

The River Gas Company has advanced its rates to 26 cents net. Belpre and Newport also served by the company, are included in the raise.

Wapakoneta

The new rate schedule adopted by the Dapakansta Gas Company is as follows: For the first 5,000 cubic feet, 45 cents; for the next 20,000 cubic feet, 50 cents; for the next 5,000 cubic feet, 60 cents; for all over 30,000 cubic feet, 70 cents per 1,000 cubic feet, no consumer to be permitted to use more than 35,000 cubic feet in any one month. A summer rate of 50 cents per month is also provided.

As we advance in life, we learn the limits of our abilities.—Froude.

OKLAHOMA—Cushing

The Creek County Gas Company has been authorized to increase its rate for industrial gas to 15 cents per thousand.

PENNSYLVANIA—Harrisburg

The following companies have filed notices indicating rate increases in the territories served by them: Sligo Natural Gas Company, Penn Central Light & Power Company, Eldred Home Gas & Fuel Company, Eastern Pennsylvania Light, Heat & Power Company, and Slippery Rock Heat & Light Company.

TEXAS—Brownwood

The Lone Star Gas Company, it is reported is working out a plan for a pipe line from the gas fields located west of Brownwood to Fort Worth. It is said also, that the Empire Gas & Fuel Company is considering supplying natural gas from these fields to the Texas Power & Light Company. The latter company now distributes artificial gas in this city.

Texarkana

Authority has been given the Southwestern Gas & Electric Company to increase its rates to domestic consumers to 40 cents per thousand.

ITEMS OF FINANCE

NEW YORK—Buffalo

The Public Service Commission has authorized the Iroquois Natural Gas Company to acquire 3,010 shares, par value $100, of the outstanding capital stock of the Erie County Natural Gas Fuel Company, at a total cost of not more than $144,480. The remaining 1,740 outstanding shares may be bought for not more than $37 each. The order provides that the Iroquois Company shall offer holders of the 1,740 shares $37 each for them, and that it may purchase all offered within 60 days.

Le Roy

The Pavilion Natural Gas Company has filed with the Public Service Commission, Second District, a petition asking for consent to increase its capital stock from $100,00 to $600,000.

The Pavilion Company operates a natural gas plant in Wyoming, Genesee and Livingston counties and the petition states that its properties and franchises are worth to exceed $600,000. The company desires to increase its capital stock to discharge indebtedness of about $300,000 contracted during the past three years for improvements and extensions. The indebtedness, it is stated, is held by stockholders who are willing to accept the company's stock.

It is also claimed that money has been expended from incomes for increasing the company's facilities and that there are surplus funds available for distribution to stockholders amounting to $240,000 and that stockholders are entitled to a distribution of the surplus in the form of capital stock.

New York City

The Board of Directors of Standard Gas & Electric Company has declared the regular quarterly dividend of one and one-half per cent. (1½%) on the preferred capital stock of the company, payable December 16, to stockholders of record November 30, 1918.

PENNSYLVANIA—Pittsburgh

The financial report of the Pittsburgh Oil & Gas Company for nine months ended September 30th, shows earnings of $721,845; expenses, $423,684; tax reserves, $25,352; amortization reserve, $59,576; dividends during period $120,000, and net surplus $93,233.

INCORPORATED

LOUISIANA—New Orleans

The Orleans Oil & Gas Corporation has been incorporated with the following officers: President, F. H. Wickett, of Chicago; Secretary and Treasurer, W. E. Lawrence, of New Orleans; Superintendent, K. M. Hancock.

WEST VIRGINIA—Clarksburg

Under the State laws of West Virginia the Tennessee Oil & Gas Company, has been granted a charter to operate in Tennessee. Capital stock, $50,000. Incorporators: S. C. Paul, H. C. Owen, C. F. Kenny, C. L. Wagner and I. T. Wood, all of Pittsburgh.

GENERAL

DISTRICT OF COLUMBIA—Washington

A portrait of Henry L. Doherty, painted by De Tayhe, was presented recently to the Doherty Men's Club, whose rooms are at 1329 K Street, in this city. The presentation was by R. R. Choate of the Crew-Levick Company, and was accepted for the Club by Harry D. Williams, who is head of the New Business Department.

KANSAS—Elk City

The Union Oil Company has drilled in a 30,000,000-foot well in its No. 1 on the Lewis farm, in Section 27-31-13.

Oil Hill

For the conservation of worn-out boilers, the Empire Gas & Fuel and associated companies will shortly start the erection of a complete boiler plant at Oil Hill, Kan. It is planned to rebuild every boiler at a minimum cost, and it is anticipated that no new boilers will have to be bought for some time.

When a man asks your advice, he generally wants your praise.—Chesterfield.

Kansas City

The 18-inch gas pipe line connecting the Wann, Portland, and Bigheart fields was recently completed and placed in commission. The line has been under construction for over a year. It is something over thirty-one miles long, of which the greater portion was most difficult of construction on account of the long stretches of rough country through which the line passes. Much blasting was necessary, and it is said that as high as fifteen tons of dynamite were used in the trenching work.

St. Louis

According to findings of the Fuel Administration, more than $9,000,000 worth of natural gas was wasted during the past year in Missouri and Kansas cities, due to leaks. This means that 27 to 73 per cent. of natural gas delivered is lost through leaks in pipe lines and mains.

Wellsville

Milligan and others have a 1,000,000-foot gasser in their No. 3 on the S. A. Seyler land in Section 4-16-21, two miles southeast of town.

KENTUCKY—Louisville

The United States Fuel Administration has issued an order restricting the consumption of natural gas at Louisville, Ky., to one thousand cubic feet a day per consumer in periods of cold weather when the demand exceeds the available supply from West Virginia. At other times no restrictions are imposed. Application of the order will be under the direction of the Kentucky Fuel Administration. The National Fuel Administration also suggests that arrangements be made between the company and the city of Louisville whereby the company's gas manufacturing plants would be used in periods of emergency.

Louisville

A twenty-five mile pipe line is planned by the Louisville Gas & Electric Company to pipe gas from the fields in Floyd County to the company's West Virginia line. 12,000,000 cubic feet per day have been contracted for.

LOUISIANA—Bastrop

The Morehouse Gas Company, it is reported, has closed a contract with the Indiana Glass Company under which the latter is to be supplied with 4,000,000 cubic feet of gas per day, for the manufacture of glass containers.

Bossier Parish

In the Elm Grove District, the Texas Company completed a 35,000,000-foot gas well in No. 2 Giddens, Section 17-16-11. The well was brought in at 840 feet and had 340 pounds rock pressure.

Monroe

The Monroe Gas Company, at its annual meeting of stockholders, re-elected the former directors, and Guy P. Stubbs to take the place of Louis Lock, deceased. The officers for the ensuing year will be: George G. Weaks, president; Oscar Nelson, vice-president; Carl McHenry, secretary-treasurer.

Morehouse Parish

The Morehouse Oil & Development Company is setting six-inch casing in its well No. 3, N. E. corner Section 33, T 22 N. R. 5 E., at 2,260 feet.

The Texas Company has started rig for its well No. 1 in this Parish. Sec. 9 T. 21 N. R. 5 E.

The Morehouse Oil & Development Company has started rig for its No. 4 well in Section 35 T. 22 N. R. 4 E.

Union Parish

In the Monroe District, the Thrift Oil Company completed a 7,000,000-foot gas well at 2,150 feet in No. 1 Jules Park, Section 38-20-4E.

NEW YORK—Fremont

Drilling operations are under way on the farm of Frank Bardeen. Leases covering 3,500 acres of land in this vicinity have been filed, and the development work is progressing rapidly.

OHIO—Ada

The Ada Natural Gas & Fuel Company has taken over the property of the Ada Water, Heat & Light Company.

OKLAHOMA—Bartlesville

The following officers were recently elected by the Doherty Auxiliary: Mrs. R. H. Robinson, president; Mrs. H. R. Straight, vice-president; Mrs. Hudson Layton, secretary; Miss Elsie Wallace, special representative of the social welfare department.

A recent examination of the payrolls of the various Empire Gas & Fuel and affiliated companies shows that the employes now number 7,246 men and 398 women. In February the figures were 6,649 and 214 women. These men and women are employed in all the general and branch offices, in the various fields and the refineries.

Butler County

In the Rose Hill District, the Lucky Eight Oil Company's No. 1 Piper, in Section 13-29-3, found 750,000 cubic feet of gas at 1,860-80 feet.

The Texas Company's No. 5, on the Bush farm, in Section 24-29-5, is flowing 24 bbls. and yielding 3,000,000 feet of gas from sand at 2,788 to 2,930 feet.

The Empire Gas & Fuel Company has completed a 10,000,000-foot gasser in its No. 1 test on the Shellbank land in Section 24-27-8 at a depth of 1,100-30 feet.

Creek County

White & Black have a 2,000,000-foot gasser in sand at 3,000 to 3,030 feet in No. 2 on the Davis farm, in Section 1-17-7.

Kay County

In the Blackwell District, the Empire Gas & Fuel Company found a 6,000,000-foot gas production in sand at 2,265-90 feet in No. 4 on the Williams farm. Section 32-29-1 east.

The Empire Gas & Fuel Company has a gasser in its No. 7 on the Harvel farm in Section 6-28-1 east, in sand at 2,195 to 2,208 feet.

Advantage is a better soldier than rashness.—Shakespeare.

The Blackwell Oil & Gas Company's No. 2 on the U. S. Smelters land, in Section 15-27-1 west, is a 2,000,000-foot gas well from sand at 702-12 feet.

Le Flore County

In Cameron District, the American Indian Oil & Gas Company finished No. 1, Tucker, in Section 22-7n-26e, in sand at 1,600 to 1,730 feet. The well is a 750,000-foot gasser.

The Le Flore County Gas & Electric Company has a 6,000,000-foot gas producer in No. 1 on the Rufus McClure farm, in Section 23-7-26, in sand at 1,490 to 1,640 feet. The same company's No. 2 on the Esther Hill farm, in Section 27-7-26, is good for 3,500,000 feet of gas from sand at 1,660 to 1,800 feet. The company also drilled one good for 1,400,000 feet on the Susan Todd farm, in Section 27-7-26, in sand at 1,510 to 1,690 feet.

The American Indian Oil & Gas Company's No. 1 on the Izora Hill farm, in Section 28-7-26, is good for 22,000,000 feet of gas from sand at 1,770 to 1,920 feet, and the same company got a 16,000,000-foot gas well on the Orval Hill farm, in Section 28-7-26, in sand at 1,645 to 1,810 feet.

In the Heavenor District, the American Indian Oil & Gas Company, drilling for gas, got a failure on the segregated coal lands in Section 19-6-27.

Muskogee County

E. M. Arnold has a 7,000,000-foot gas well in his No. 1 Barnett, in Section 34-16-15, Haskell Stone Bluff District, in sand at 1,131-39 feet.

Noble County

In the Billings District, the Humphrey Petroleum Company and Gillespie & Guffey's No. 3 on the Neil farm, in Section 15-23-2 west, is an 8,000,000-foot gas well in sand at 1,010 to 1,011½ feet.

Okfuskee County

In the Weleetka District, the Kingwood Oil Company's No. 2 on the Beaver farm, in Section 4-10-12, is a 2,000,000-foot gasser from sand at 964-915 feet.

Okmulgee County

In the Tiger Flats District, A. R. Preston's No. 1, Snakeya in Section 9-13-12, is a gas well good for 15,000,000 feet from sand at 2,054-61 feet.

J. H. Rebold's No. 1, Harjo, in Section 16-13-12, is doing 15,000,000 feet of gas from sand at 2,103 to 2,138 feet.

Osage County

The Middle State Oil Company's No. 1 in Section 25-34-9, is a 5,000,000-foot gas well in sand at 2,030-47 feet.

The Echo Oil Company drilled a 2,000,000-foot gasser in sand at 2,005-63 feet in No. 2 in the center of the west line of the northwest quarter of Section 6-24-10.

W. J. Knupp has a gas well in No. 2, in Section 17-27-11.

The Enterprise Transit Company's No. 1 in Section 31-27-12 is showing 5,000,000 feet of gas from sand at 1,745 feet.

Pittsburgh County

In the Featherstone District, the Quinton Relief Oil & Gas Company drilled into a 35,000,000-foot gas production in sand at 1,497 to 1,620 feet in No. 1 on the Riddle farm, in Section 12-7n-18e.

Pontotoc

The Lomore Oil Company's No. 3 Robinson, in Section 36-1s-5w, is good for 8,000,000 feet of gas from sand at 650-665 feet.

Pawnee County

In Northwestern Black Bear District, the Otoe Petroleum Company's No. 1 on the Brown farm, in Section 28-23-3, was abandoned as dry at 2,305 feet.

The Fortuna Oil Company is shut down at 2,385 feet on No. 1, Homartha, in Section 33-23-3. A 1,000,000-foot gas showing was found in sand at 2,340-41 feet.

Stephens County

The Wichita Gas & Fuel Company has drilled in several very good gassers in a new field in this county. Report has it that the gas from this field will be piped to Duncan and Marlow.

Tulsa

The Roxana Petroleum Company has a 6,000,000-foot gasser in No. 5 on the Schroeder farm, in Section 18-22-3, in sand at 1,921 to 1,927 feet.

In the Red Fork District, Billingslea and others have a 4,000,000-foot gasser in No. 3 on the Hardridge farm, in Section 20-19-11, in sand at 1,670 to 1,714 feet.

The Skiatook Gas Company has a gasser good for 8,000,000 feet in No. 4 on the Lowery farm, in Section 11-22-13, in sand at 1,790 to 1,793 feet.

The Southwestern Petroleum Company's No. 1 Mitchell, in Section 11-22-13, is making 800,000 feet of gas from sand at 1,210 to 1,301 feet.

The Tulsa Fuel Company's No. 2 on the Justice farm, in Section 36-22-13, is good for 1,500,000 feet of gas from sand at 1,316-54 feet.

PENNSYLVANIA—Allegheny County

In the Ingomar pool, M. M. Walley & Company drilled a test on the Wilson lot through the gas sand, developing a fair gas pressure in that formation.

Butler County

In the Zelienople District, the American Natural Gas Company has a third sand gasser at its test on the John Barnes farm.

Greene County

In the Bristoria District, the People's Natural Gas Company's No. 2 on the M. Henneman farm is a gasser in the fourth sand. In the same district the Philadelphia Company got a Gordon sand gasser on the A. F. Phillips farm.

Admiration is an art which we must learn.—George P Upton.

TENNESSEE—Scott County

It is reported that in the territory being tested for natural gas and oil, one gas well which was drilled in a year ago is holding up production sufficient to supply adequately a number of industrial concerns. Several good oil wells have also been completed in this field.

Warren

The Bell Oil & Gas Company recently took over the properties of the Globe Oil Company, the Ohio Oil Company, the Warren Petroleum Company, and the Northwestern Oil Company. The capital stock of the Bell Oil & Gas Company is said to be $1,000,000.

Washington County

In West Bethlehem Township, the Greensboro Natural Gas Company has a small gasser in the salt sand on the James Ansfield farm.

TEXAS—Austin

Oil companies operating in Texas are required to file each quarter the gross amount of their production in the State. This is for the purpose of forming a basis for State taxation, but it is also valuable in safeguarding the public against extravagant statements made by promoters. The reports are filed with the State Comptroller at Austin, and are there on file for public inspection. These statements of production are sworn to, and form an interesting report of the success of operating companies. The Texas plan is one of the best to check wildcat promotions and stock selling schemes by unreliable oil companies.

Eastland County

The Prairie Oil & Gas Company's No. 2 in the Terry land is showing 1,000,000 cubic feet at a depth of 3,235. The company's No. 1 on the same property is making 30,000,000 cubic feet of gas and is spraying oil at 3,250 feet.

The Mid-Kansas Oil & Gas Company's No. 1 Cook is making 6,000,000 feet of gas at 1,900 feet and is complete at this depth.

Eastland County

The Texas Company has a good gasser in its No. 3 on the Duffer property located west of Ranger.

Fort Worth

The Texas & Pacific Coal, Oil & Gas Company's No. 1 on the Rice property is reported as having a volume of 30,000,000 cubic feet.

Galveston

It is reported that the 12-inch line from the Ranger field to the coast at Galveston has been abandoned by orders of the government. This line was to be built by the Prairie Pipe Line Company under government orders in order to supply ships with crude oil more quickly. The armistice disposed of the need for the line and it has been dropped. The pumps and pipe line which had been ordered will probably be used for other lines between the Ranger field and Oklahoma.

Potter County

The Hapgood Company's No. 1 Masterson is making 3,000,000 feet of gas and a showing of oil at 2,000 feet. This test is located north of Amarilo.

Young County

The Roxana Petroleum Company's No. 1 Good reached the top of the sand at 4,023 feet and is showing 1,000,000 cubic feet of gas. The outside pipe is being pulled.

WEST VIRGINIA

According to the report for the fiscal year ending June 30th, 1918, gas production in West Virginia was 16,040,535,000 cubic feet less than for the fiscal year 1917. Consumption of natural gas in the State was 1,844,000 less than for the 1917 period, and the amount of gas sent out of the State was 6,577,555,000 less than during 1917.

Braxton County

In Salt Lick District, the Burnsville Oil & Gas Company is drilling at 2,200 feet on the O. N. Hinkle farm.

Doddridge County

In Greenbrier District, the Wayland Oil & Gas Company has the rig completed for another test on the W. L. Slusser farm.

In Grant District, the Manufacturers Light & Heat Company has a stray sand gasser at a second test on the H. B. Davis farm.

Harrisville

According to report, the Imperial Oil & Gas Products Company will shortly acquire the municipal gas plant. The company will sell its product at 27 cents per thousand.

Harrison County

In Union District, the Reserve Gas Company has completed a test on the W. J. Oldaker farm. It is a gasser in the fifth sand. In the same district, the same company is drilling a test on the C. L. Andrews farm.

Lewis County

In Freeman's Creek District, the Reserve Gas Company's test on the Leo Rauch farm is a fair gasser in the Gordon sand.

Marshall County

In Liberty District, the Patterson Glass Company has developed a gasser in the salt sand at its test on the Hugh Matthews farm. In the same district the Manufacturers Light & Heat Company has a light gasser in the same formation at a test on the George Chambers farm.

Marion County

In Mannington District, the Manufacturers Light & Heat Company is testing No. 2 on the William Troy farm in the 30-foot sand.

Men cling to what they see through, like an insect to a pane of glass.—Train.

Monogalia County

In Battelle District, the South Penn Oil Company completed No. 5 on the Fox heirs' farm. It is a gasser in the fifth sand.

Located in Clay District, the Carnegie Natural Gas Company's No. 4 is a gasser in the fifth sand.

Tyler County

On Indian Creek, McElroy District, the Hope Natural Gas Company completed in the Gordon sand a test on the Hiram Ferrell farm. It is a light gasser in that formation.

Wetzel County

In Church District, the Philadelphia Company has a light salt sand gasser at its test on the Addison Main farm. In the same district the Manufacturers' Light & Heat Company has a crooked hole at its test on the J. D. Horner farm.

In Church District, the Carnegie Natural Gas Company drilled a second test on the W. H. Earnshaw farm through the fourth sand. Nothing was found in the fourth sand but a light gas pressure developed in the Gordon sand.

In Grant District the Philadelphia Company's No. 4 on the H. L. Morgan farm is a gasser in the Big Injun sand.

In Clay District the Hope Natural Gas Company drilled its test on the Josephus Rice farm through the fifth sand. Nothing was found in that formation and only a light gas pressure in the fourth.

WYOMING—Basin

The natural gas plant of the Wyoming Gas Company is now in operation and is supplying its product in this city and in Greybull. The company is under the management of T. K. Bishop.

Riverton

The Producers & Refiners Corporation, it is said, is planning an absorption gasoline plant in connection with its distribution system which will supply Riverton with gas from the company's well twenty-three miles south of town.

NETHERLANDS—Velsen

It is reported that natural gas has been discovered at Velsen (province of Overijsel), Netherlands, to the extent of 15 cubic meters per hour. The gas being supplied to the commune at .08 florin (about 4 cents) per cubic meter.

ONTARIO—Bridgeburg

In an effort to conserve gas here, the Provincial Natural Gas Company has announced that no more gas may be burned in furnaces.

WASTE OF NATURAL GAS.

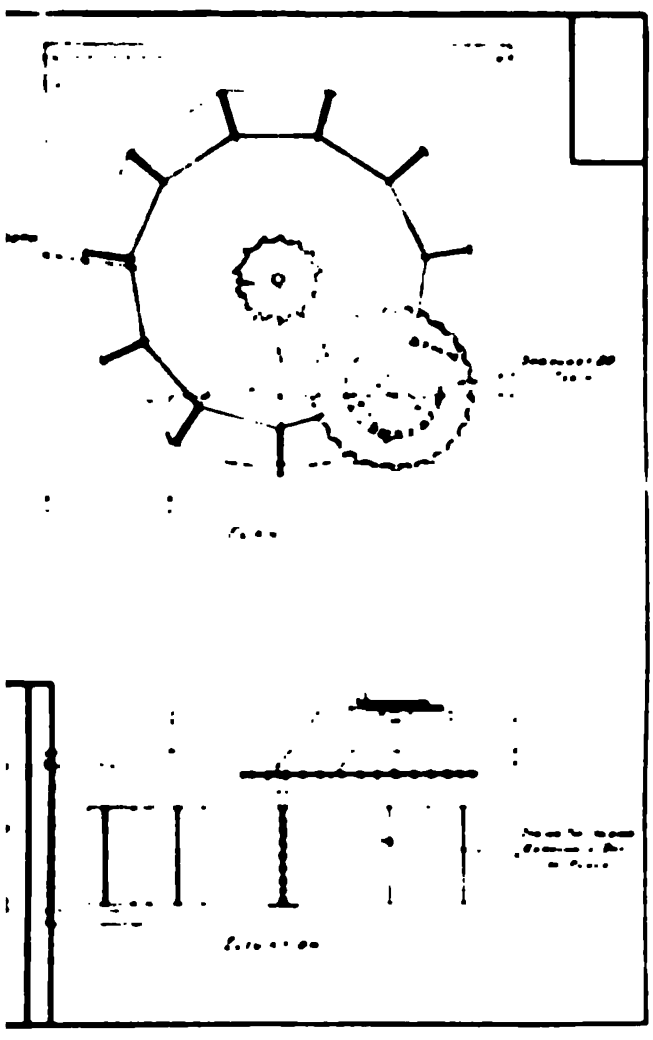
NATURAL gas valued at $9,000,000 was wasted in one year in a certain group of cities and towns in Kansas and Missouri, according to figures compiled by experts of the United States Fuel Administration. Efforts are being made to prevent further waste and to determine whether the fault for this wastage rests with the wholesale or distributing companies. Arrangements have been made to have all wholesale meters in the affected district checked by the Bureau of Standards.

COUPON CUTTING MACHINE

F. W. Burrell, Cashier, Joplin Gas Co., Joplin, Missouri

The drawing herewith shows a coupon cutting ma ne attachment

The idea of the machine is to save time of sorting stubs o their thousands at the time same are receipted by ting dial to any number from one to eleven. All stubs on number one to one thousand will go into box num one, one thousand to two thousand in box number , and so on up to and including ten thousand. Set g of dial only requires second of operator's time and



h stub has gone to its proper box the operator removes half of the coupons in the box and places them in the usual order face up and in front of the machine, thus making a saving of time and bridging the gap between offices. If you should want to refer to any stub after clearing the day work can be done more quickly.

The distributer can be attached to any machine where a short time as all that is necessary is to remove the dial which can be done in a few seconds. The machine is 18 inches square and takes up no more room than a 18 inches square when not in use. It may be removed leaving eleven

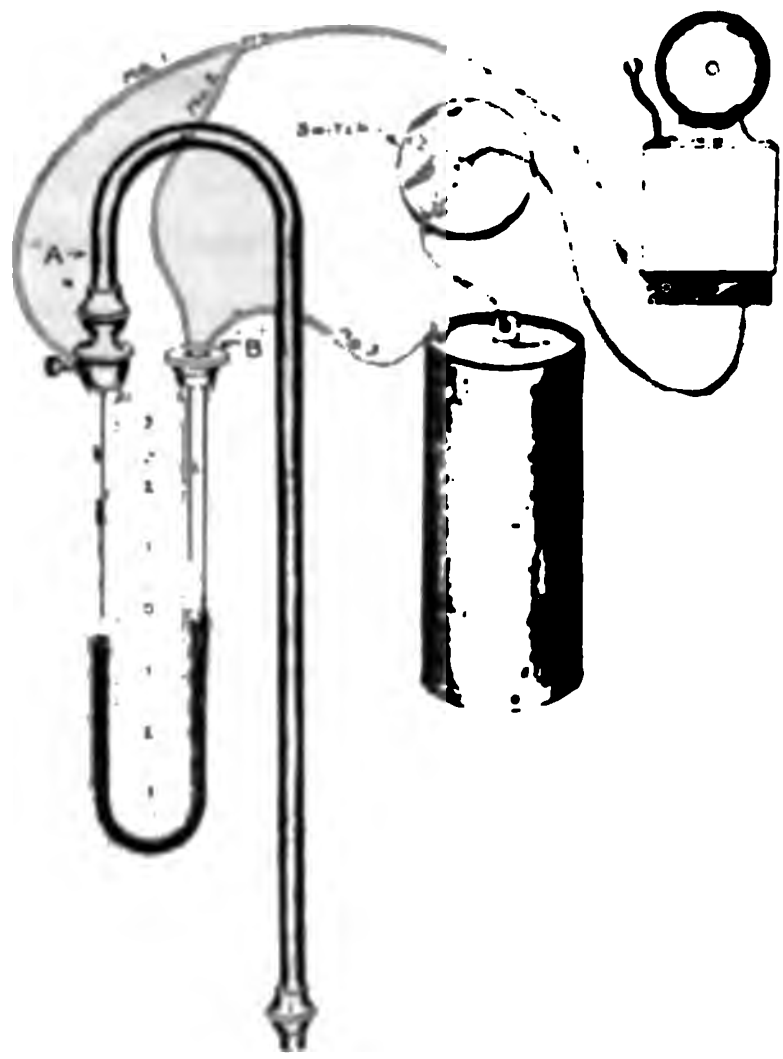
COMBINATION GAS GAUGE AND SIGNAL BELL

C. C. Tucker, The Lee Gas Co., Macomb, Ohio

This wrinkle was submitted by Mr. Tucker who has used it for years, but it may be new to others.

Solder a piece of No. 14 bare copper wire to end of gooseneck marked "A". Cut wire off so that when goose neck is in place and fastened to the "U" tube the wire will stop at a point just short of 2 inches zero, this will equal 4 inches. Then drill two 1/16" holes in the vent cap, one on each side of the vent hole.

Take two No. 18 insulated copper wires, clean in sulation from No. 2 wire for 1/2" and from No. 1 wire



SPEED IN USING BLOTTING PAPER.

M. A. Rady, The Logan Nat. Gas & Fuel Co., Wellington, Ohio.

In entering readings, consumption, etc., on gas bills the time consumed in handling a blotter can be cut in half by cutting a strip from the end of a blotter the width of a finger, with a rubber band fasten same over the end of the second finger of the writing hand and with ten minutes' practice work can be turned out with speed and ease.

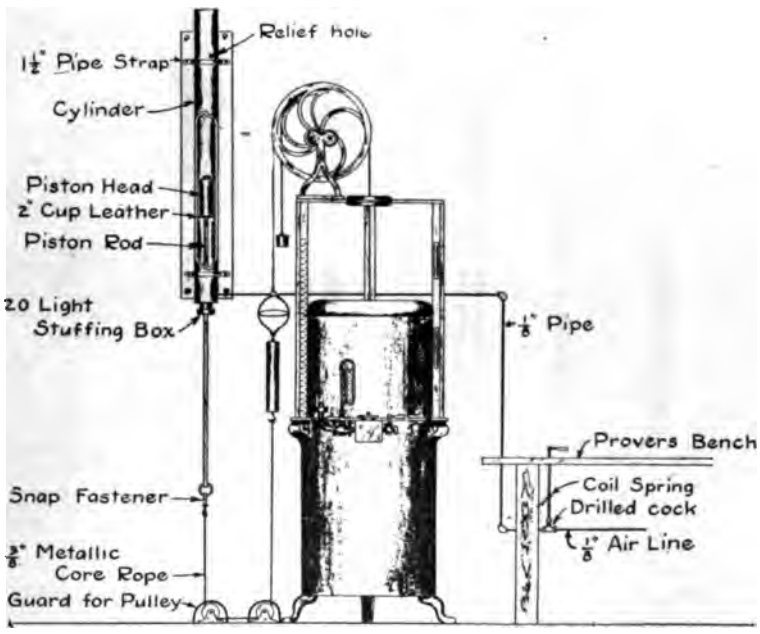
Though I have been using the above stunt for about five years, yet it may be new to some.

DEVICE FOR RAISING METER PROVER BY AIR.

A. H. Fricker, the East Ohio Gas Company, Youngstown, Ohio.

This arrangement saves time and labor, for the man using it can work prover much faster than pulling it up by hand.

It is not expensive to make; the cylinder consists of 2" brass tubing, and piston is made of 1½" lead pipe swedged out to fit the inside of the cylinder. The lead pipe is filled with lead and drilled through the center. This gives the piston enough weight to make the return



DEVICE FOR PULLING UP METER PROVER

for another pull. The piston rod is 5/16" steel, polished to prevent friction in the stuffing box. The leather is of common 2" cup leather, such as used in test pumps.

The valve is placed below the prover's bench, as shown on the air line and an extension rod to extend up through the bench with handle on top of same. The valve is drilled through the side in such a manner that when opened the air enters the bottom of the cylinder and when closed, permits the air to escape through the drilled hole.

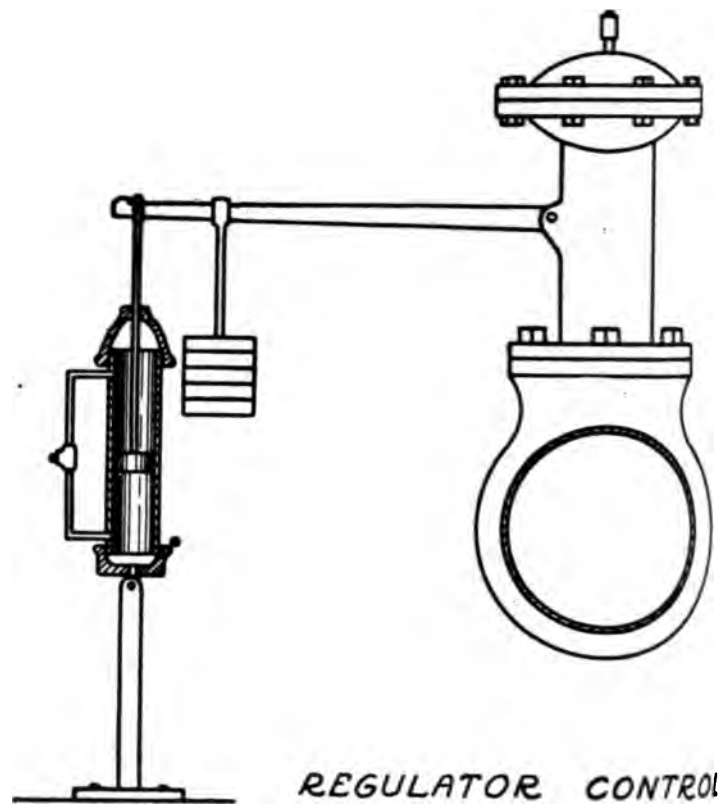
A spiral spring is attached to the extension rod under the bench to shut valve off when handle is released; this spring prevents possible opening of valve by accident, unless the prover wishes to do so.

The cylinder should be about 10" longer than the scale on the prover. A hole is drilled near the top of cylinder so that when piston is raised high enough to pull prover up to its limit, it will be above this relief hole, thus permitting the air to escape below the leather from the cylinder.

REGULATOR CONTROL.

R. B. Lloyd, Superintendent Lines, H. O. Ballard, Superintendent Production, Wichita Natural Gas Co., Bartlesville, Okla.

This wrinkle consists of an old piece of working barrel with a solid cap on the bottom end and a reducer on the top end, with a ¾-inch piston rod extending from the regulator arm to the piston ring inside the barrel, with a ¼-inch by-pass extending from the bottom to within 5 inches of the top, with a common brass cock in the by-pass. The barrel is filled with any kind of heavy oil. This is to keep a regulator from opening or closing too



REGULATOR CONTROL

far when the regulator is inclined to stick. The by-pass cock being closed to allow but a small amount of oil to pass. Should the regulator stick up and finally loosen, it will not allow the weights to drop fast, but to lower slowly. The same thing applies, should the regulator lever stick down.

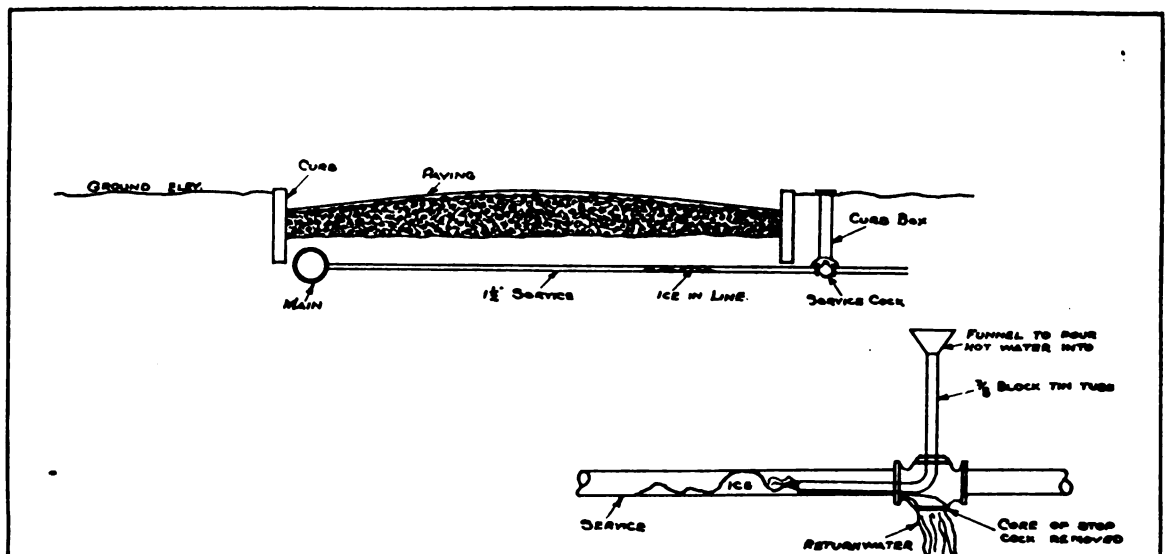
This works very effectively whenever there is an uneven flow through the regulators, like glass plants or close to an orifice meter.

THAWING OUT SERVICE LINES WITHOUT CUTTING PAVEMENT.

A. W. Gavin, Assistant City Superintendent, Iroquois Natural Gas Co., Buffalo, N. Y.

The attached sketch suggests a method of thawing out a service pipe, frozen between stop-cock and main-line, without cutting piping or pavement.

This is done, as shown in sketch, by removing core of stop-cock, inserting ⅜-inch block tin tube and applying water; the water is driven back through core of stop-cock by the pressure of gas as the thawing progresses.



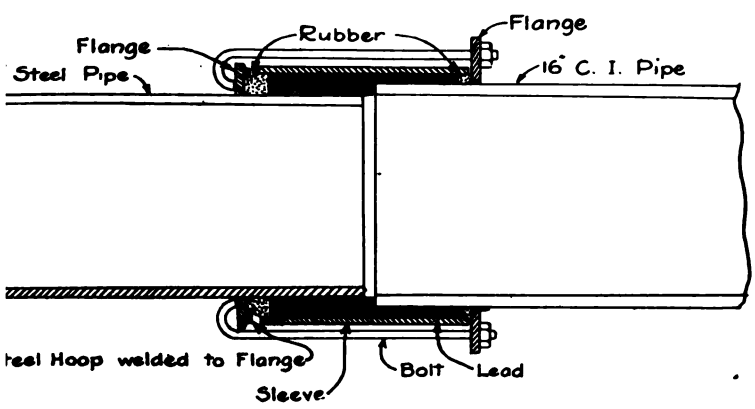
THAWING OUT SERVICE LINES.

STOPPING LEAKS ON LEADED SLEEVE JOINT.

F. Dooling, The East Ohio Gas Co., Cleveland, Ohio.

The difference in O. D. between cast iron and steel pipe make it necessary to use rubbers of different thickness. The flanges and "J" bolts were home-made.

This method has given satisfaction and is vouched for by Mr. Dooling.

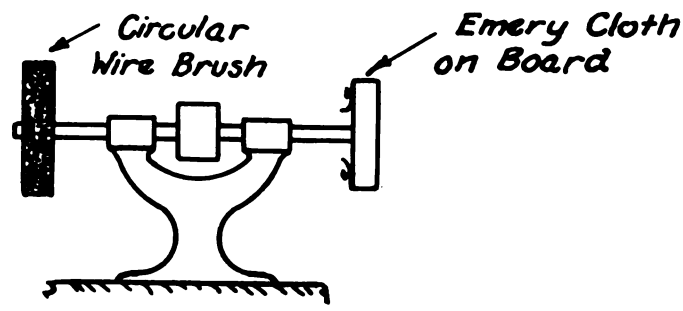


SHOWING METHOD OF STOPPING LEAKS.

VALVE GRINDER FOR TOBEY METERS.

J. R. Gilbert, Fort Worth, Texas.

A piece of board covered with emery cloth and revolved by a power attachment makes a cheap grinder for valves and valve seats of tobey meters.



VALVE GRINDER.

TO CLEAN HARD PAINT FROM METERS.

J. R. Gilbert, Fort Worth, Texas.

A circular wire brush revolved by power makes a useful device for cleaning hard paint from meters.

USE STAPLE IN PLACE OF TACK.

Wm. Heazlett, Shop Foreman, Peoples Natural Gas Co., Latrobe, Pa.

The photo is of a little staple which I use for fastening rubber rings together when putting on split sleeves where lines are broken. I find they will hold against a very high pressure.

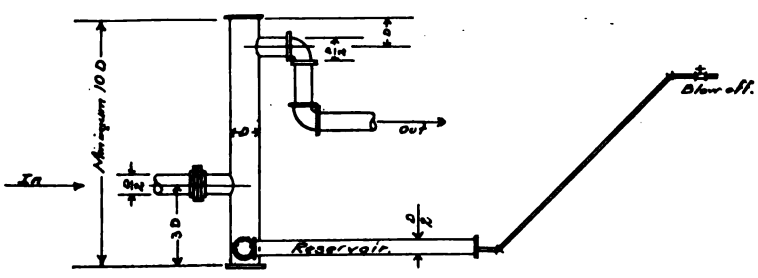
STAPLE FOR FASTENING RUBBER RINGS TOGETHER.

The old way of using tacks is not very satisfactory as the pressure blows the tacks loose and the tacks do not make a good job, but the staple holds the ends in a perfect circle as you will see in the photo, while tacks leave a loose end. The staple should be about two and one-half inches long and made of soft wire, with tongs long enough to go through the rubber and turn enough to make it impossible to pull out.

DRIP THAT STOPS MORE LIQUID.

Elting Henderson, Station Superintendent, Midway Gas Co., Taft, Calif.

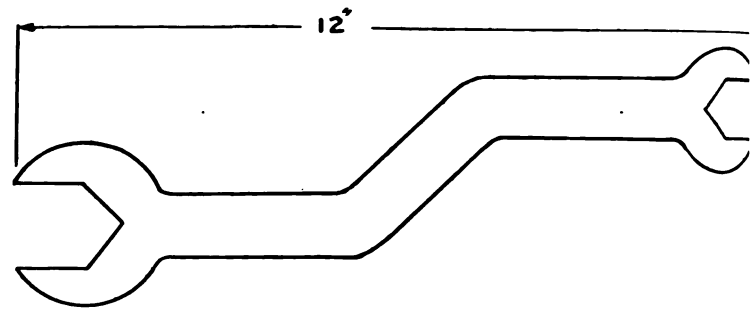
The sketch of a drip for use on gas line explains itself. We find that this type of drip stops a larger percentage of the liquid in our gas lines than any other type we have ever used.



DRIP FOR STOPPING LIQUID.

METER LEAD WRENCH.

V. A. Goble, the East Ohio Gas Co., Ravenna, Ohio.



METER LEAD WRENCH

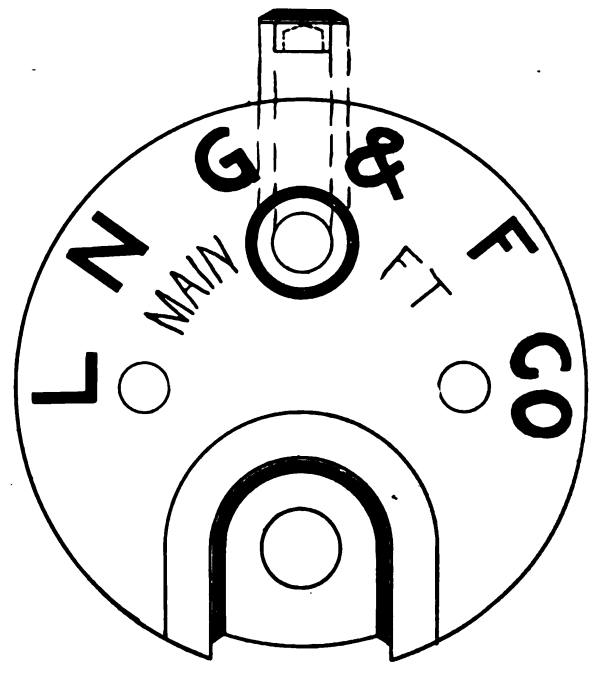
This wrench prevents the damage done to brass couplings on meter leads caused by the usual method of using a pipe wrench.

STAMP THE NUMBER OF FEET OF PIPE IN EACH SERVICE.

W. A. Ashley, Supt. The Logan Natural Gas & Fuel Co., Chillicothe, Ohio.

This drawing shows a curb box top with a button made of brass attached thereto. On this button is stenciled the number of feet of pipe put in any given service.

The number of feet of pipe is placed on this button by the fitter when he cuts out the pipe for the service.



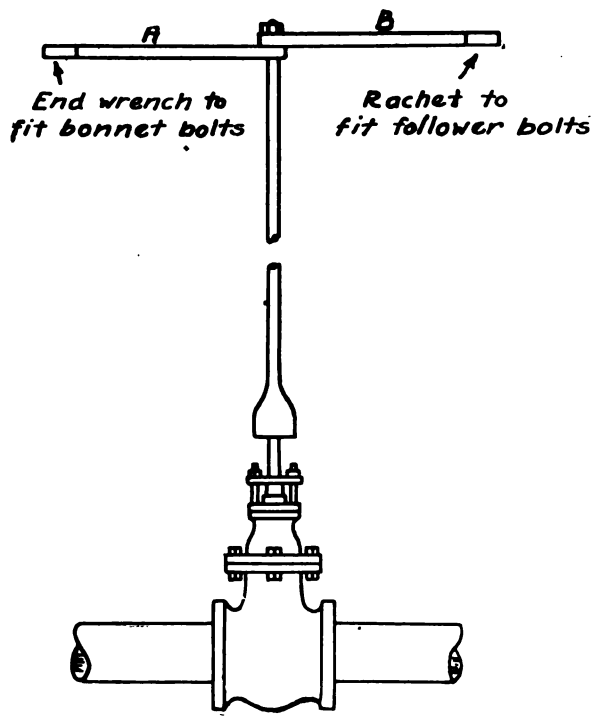
STAMPING NUMBER OF FEET ON CURB BOX TOP.

The object of this is to enable you to find the exact location of the main line should you have an occasion to locate the same. It would also be a great benefit in locating fittings on intersections of the different streets which is a great help in making an inventory of a plant.

COMBINATION SOCKET AND GATE BOLT WRENCH.

Len Ryan, Blackwell, Okla.

This wrench combines all of the tools necessary for operating or repairing gate valves. The socket wrench (C) fits a 2½-inch square nut which is placed on the stem of the gate. The top end of (C) is finished square

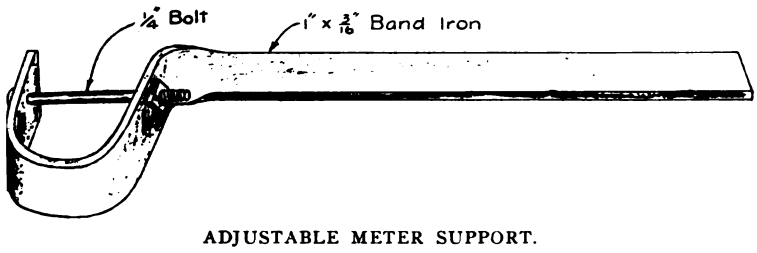


SOCKET AND GATE BOLT WRENCH.

to take wrenches A and B for use as handles. The wrenches are locked by a nut on C. A is an open end wrench which will fit the bonnet bolts, and B is a rachet wrench which will fit the follower bolts. One of these combinations left at each gate pit would prove a time and trouble saver in emergencies.

ADJUSTABLE METER SUPPORT.

O. C. Hartsough, The East Ohio Gas Co., Canton, Ohio. P. Kennedy, The East Ohio Gas Co., Cleveland, Ohio.



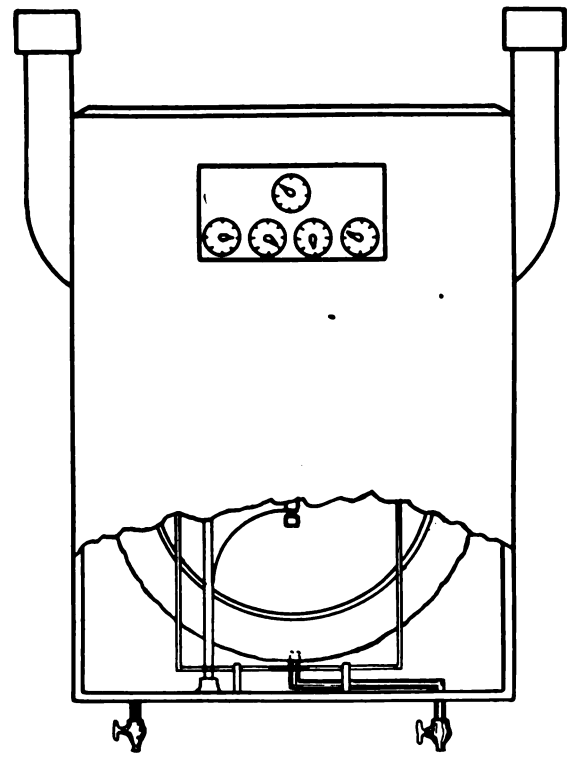
ADJUSTABLE METER SUPPORT.

This meter support is attached to the riser of the service and is set at any height desired. It gives more satisfaction than the old style meter spuds which were always liable to get loose.

DRAIN FOR METERS.

J. R. Gilbert, Fort Worth, Texas.

Attach a small brass pipe to the under ring of the diaphragm and run under and around the leather to avoid rubbing. Attach small cocks on the outside and make all



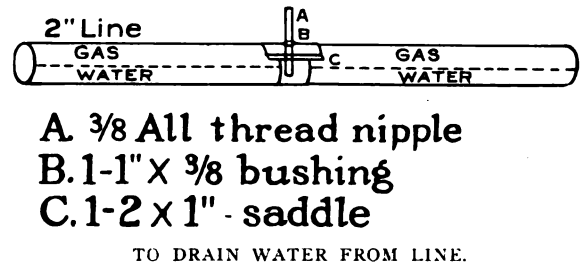
METER DRAIN.

joints absolutely tight. To drain the meter, open cocks and the gas pressure will soon force out the condensation. This device is useful especially on large meters.

TO DRAIN WATER FROM LINE.

Corwin Andrews, Agent, The Ohio Fuel Supply Company, Baltimore, Ohio.

The drawing shown is of an appliance used to drain water from the line. This is not original with me, but I



TO DRAIN WATER FROM LINE.

have used it with considerable success. It can be screwed into top of service line and the gas pressure will lift the water through the ⅜" all thread nipple.

STANDARD METER SETTING.

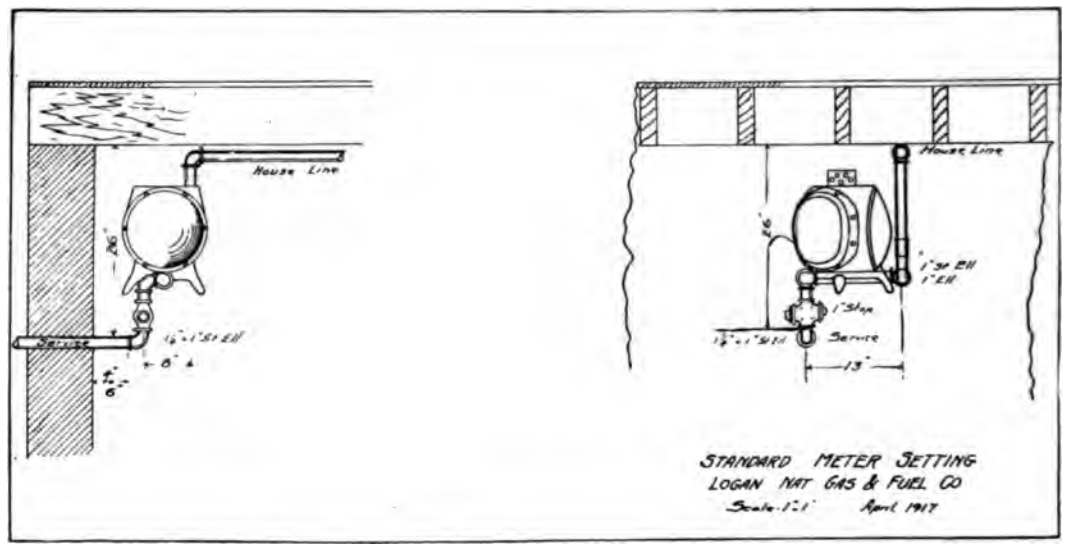
W. A. Ashley, Supt. The Logan Natural Gas & Fuel Co., Chillicothe, Ohio.

The object of this drawing is to make a standard for meter setting, a copy of which should be furnished to each fitter, who is doing this kind of work. By following the outlines specified you can connect the following sizes of meters:

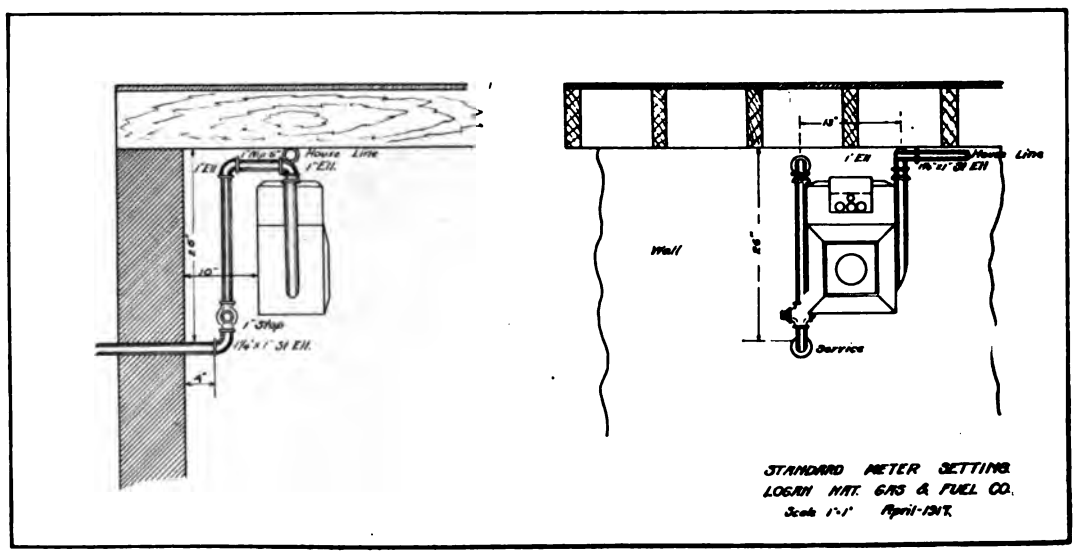
3—Light)
5— ")
10— ")
20— ")

By reversing the risor from left to right you can set a Tobey or Westinghouse meter by making a few minor changes of fittings.

This would be a great saving to the gas companies in labor and material and would be a help to the fitter as well as to the party who makes the inspection.



STANDARD METER SETTING.



STANDARD METER SETTING.

TO REMOVE HEAVY BOULDERS.

James J. Cummins, Pressure Department, The Ohio Fuel Supply Co., Columbus, Ohio.

In running a trench, we often came against a boulder and it must be removed or destroyed.

A simple method is to loosen the soil from under the boulder, next slip a heavy plank under it. Then or more men lift on each end of the plank and hoi boulder to the surface.

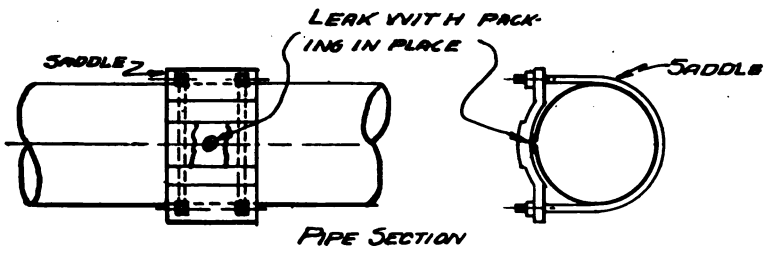
A boulder weighing from 500 to 600 pounds can e and quickly be removed in this manner.

TO REPAIR A LEAK.

Ed. Canny, Main Line Man, Kansas Natural Gas Co., Columbus, Kansas.

Easy way to repair leaks on high or low pressure and especially on pipe that is pitted and rusted. T

blind saddle made to fit pipe, some rope asbestos about ¼ inch in diameter, roll in a tight circle until you have a pad a little larger than the leak to be repaired, then take some roof cement paint or asphaltum and cover the



METHOD OF REPAIRING LEAK.

pad to fill seams with same. Then take another pad a little smaller than the first, use paint or asphaltum as before, stick second pad to center of the first, stick both to saddle and place over leak, tighten saddle and leak is repaired.

"IMPROVED DISC FOR GATE VALVES."

H. P. Zieschang, The Ohio Fuel Supply Co., Columbus, Ohio.

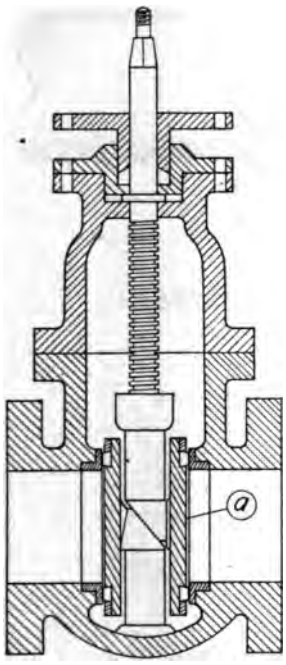


Fig. 1

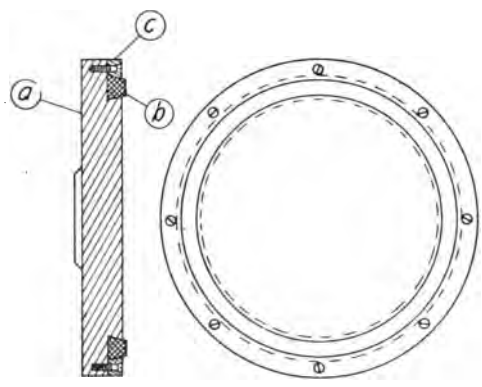


Fig. 2

DISC FOR GATE VALVES.

The cut shows a gate valve in which the disc "A" carries a rubber ring "B" held in place by a follower ring "C". The rubber ring is to be made from some of the compositions which have been so successful as gaskets for pipe line couplers, such as Paranite C or Goodrich 19. The compressibility of this rubber will make it possible to obtain tight closing of the gate even under bad conditions of grit, etc.

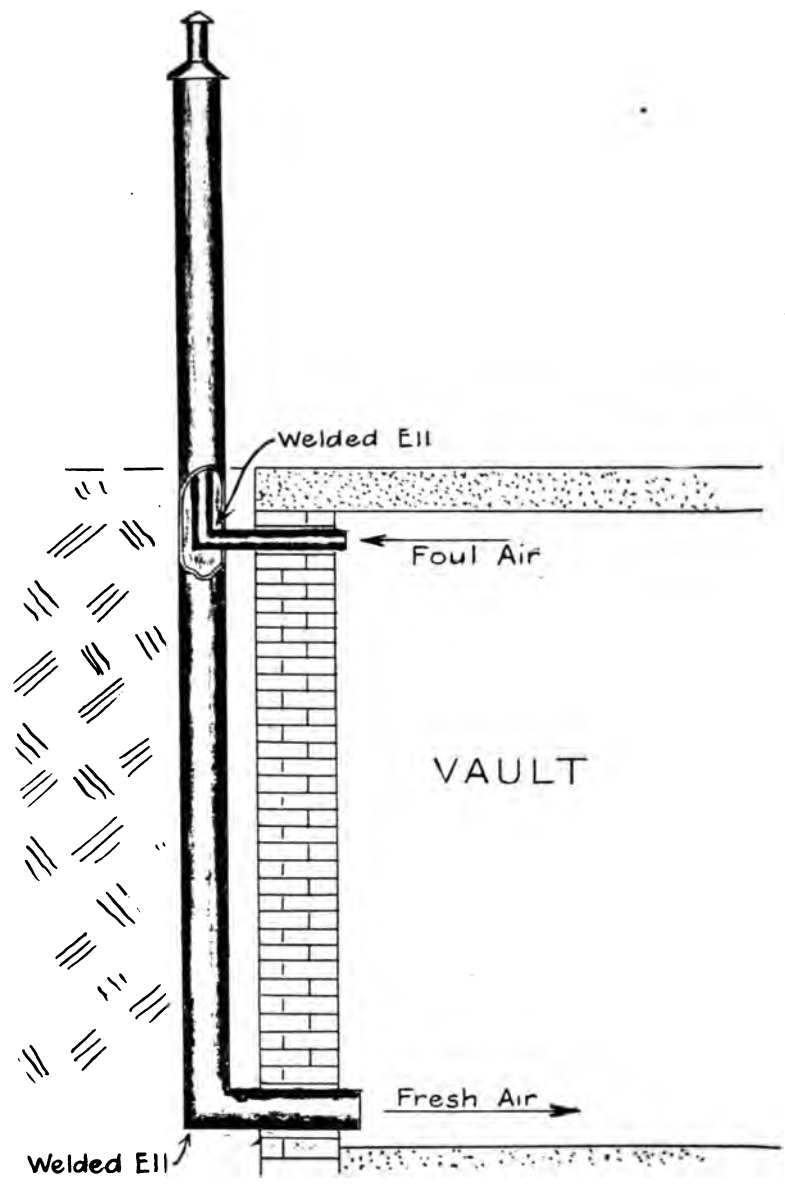
To prevent the sliding of the rubber ring over the seat face the wedge arrangement is to be of the type in which the closing movement is along the axis of the pipe.

A NEAT COMBINATION WELDED VENT.

A Vent that Dispels the Certain Objection of Property Owners as to Having Too Much Unsightly Pipes Before Their Property.

The East Ohio Gas Company, Cleveland, Ohio.

This vent can be made up of different combinations, that is: Fresh air vent, 8″ and foul air vent, 4″; fresh air, 6″, foul air, 3″; fresh air vent, 4″, foul air, 2″.



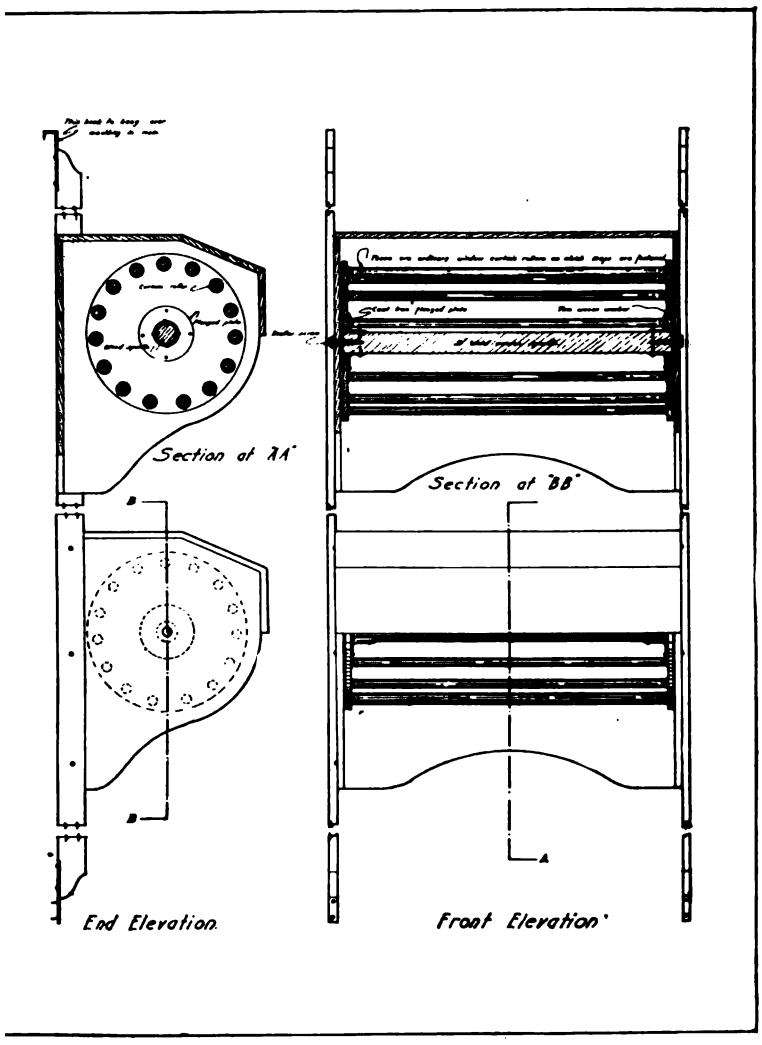
COMBINATION WELDED VENT.

The fresh air vent is cut at the point where foul air vent enters, and a hole cut for the foul air vent; and then welded together after foul air vent is inserted. The foul air vent should extend up three (3) feet above the top of the fresh air vent. Place a spider near the top of fresh air vent to hold foul air vent in place and cover both vents with galvanized iron. This vent will always remain plumb and rigid, thus preventing the unsightly feature of vents leaning in opposite directions.

MAKING HANDY MAP CASE.

S. A. McCune, Land Agent, Arkansas Natural Gas Co.

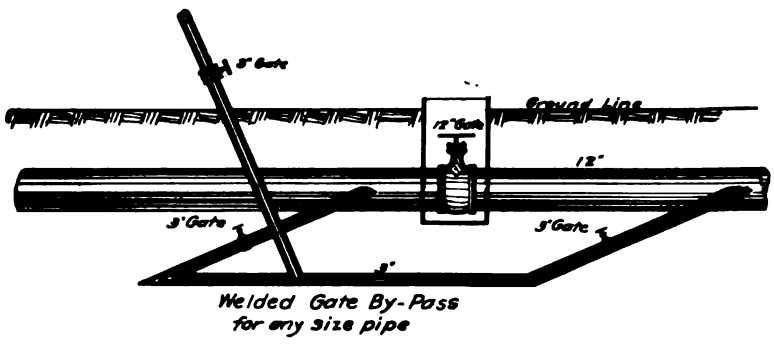
The one illustrated will hold 15 maps.



HANDY MAP CASE.

WELDED BY-PASS AROUND GATE VALVE.

H. C. Hutchings, Construction Foreman, Wichita Natural Gas Co., Bartlesville, Okla.

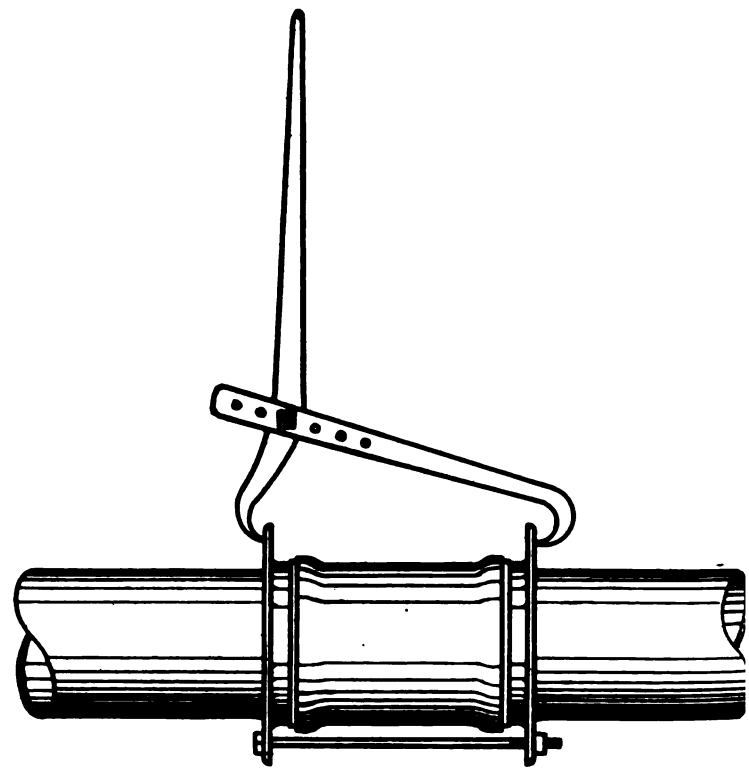


WELDED BY-PASS FOR GATE VALVE.

The ordinary gate valve by-pass is so expensive that this wrinkle was devised. It merely consists of nipples screwed into both sides of any ordinary screw or flanged gate valve and by the use of the Oxy-Acetylene process, welding the by-pass connections into both nipples and installing a side gate on each connection and completing the by-pass around the gate. If desired, a blow-off nipple with a gate on it can be welded into the by-pass.

TONG FOR COMPRESSING RUBBER COUPLING.

E. H. Cyphert, Pipe Line Foreman, Wichita Pipe Line Co. Bartlesville, Okla.



TONG FOR COMPRESSING RUBBER COUPLING

This wrinkle consists of a bar of iron ¾-inch by 2-inch by 4 feet long and one piece the same size, 18 inches long, bent to the shape of a common canthook. Whenever the rubbers will not allow the followers to go together so that the commonly used bolt is too short for threads to start; by hooking this device over the coupling and pulling the leaver, it will compress the rings so that taps may be easily started.

FLASH LIGHT BATTERIES.

A. H. Fricker, the East Ohio Gas Co., Youngstown, Ohio.

For a Five-Cell light, use a 5.3 Volt bulb and when same commences to get dim, use a 3.8 bulb until battery is played out. For Three-Cell light, after bulb becomes dim, use the same size bulb as that used in a Two-Cell light. Use a little judgment as to the proper time to change bulbs to prevent breaking same.

This amount will give double the ordinary amount of service from your batteries.

NOTICE CARD.

O. M. Baldwin, The East Ohio Gas Company, Kent, Ohio.

This card is handed out at the time application is made for a meter. The applicant is instructed to read the card carefully, so that there will be no delay about setting the meter when the gas man comes to do so. These instructions are printed on a card of suitable size.

BE SURE TO READ THIS.

TO AVOID DELAY IN HAVING GAS TURNED ON KINDLY OBSERVE THE FOLLOWING DIRECTIONS.

First—See that all gas appliances have solid connections: that is, use pipe instead of hose for connecting stoves, grates, etc.

Second—Do not connect any gas appliance unless it has a proper flue connection.

Third—Be sure that all openings in gas lines are plugged or capped.

Fourth—Place an independent valve on riser to your gas range or heating stove.

Fifth—Examine each opening where stove pipe connects to chimney to see that it is free of soot and other obstructions.

The above directions are to insure safety and our employes are instructed not to set a meter unless these directions are complied with.

FORMS FOR KEEPING RECORD OF PROPORTIONAL METERS.

C. W. Kramer, Engineering Department, Arkansas Natural Gas Company, Little Rock, Arkansas.

Form No. 140-A is self-explanatory, and, after a meter has been tested in the field, the report is sent to the Meter Department. The form is in duplicate, in book form, and duplicate copy is to be retained by the Field Inspector. These test records are filed according to their consecutive number.

Form No. 629 is the Meter Department's record of the meters. The face of the card is used to show the make, size, capacity and location of meter. The reverse side is used to keep a record of the tests, and on it is entered the date of the test, the consecutive number of the test slip (Form 140-A), the condition—fast or slow—in which the meter was found and left, also the initials of the person who ran the test.

The card is filed according to the district in which the meter is located, and, in that sub-division, according to the serial number of the meter.

ARKANSAS NATURAL GAS CO.

METER TEST REPORT.

Date....., 191....

.....

LOCATION .....

MAKE..... SIZE..... No..... CAPACITY.....

READING BEFORE..... AFTER.....

BAROMETER..... TEMPERATURE GAS..... ATMOS.....

GRAVITY..... INCHES WATER.....

FLOWOMETER TEST.

Vol. Per. Hour	Inspection Test	Final Test	Condition
Cu. Ft.	Per cent.	Per cent.	
			MATERIAL USED.
			REMARKS.
			ARKANSAS NAT. GAS CO.
			Inspector.

Form No. 140-A.

METER CAPACITY. No.

GAUGE, No. RANGE.

Location	Consumer	Date	Set Order	Rem. Ord.

TEST RECORD.

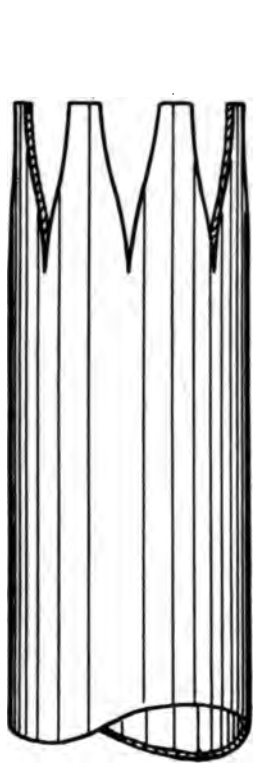
Date	No.	Found.	Left	By	Date	No.	Found	Left	By

Form No. 629.

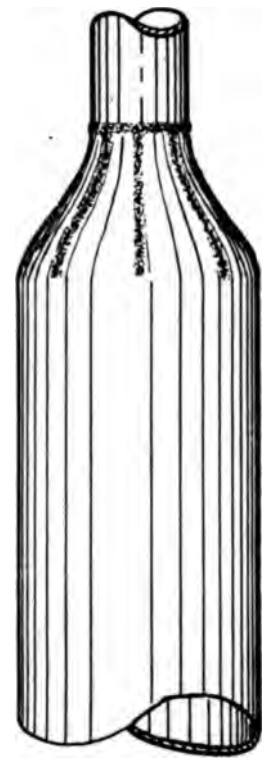
WELDED SWEDGE NIPPLE.

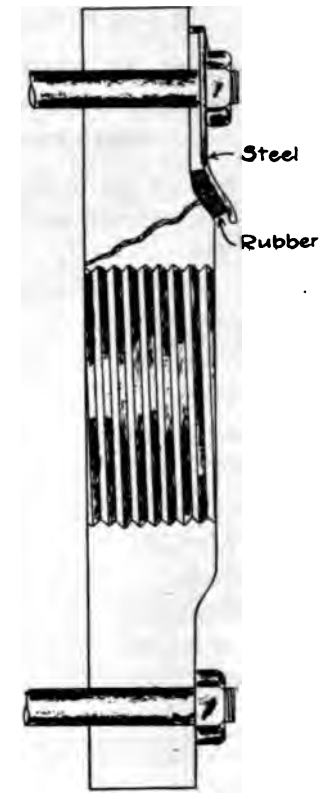
John Fink, Warehouse Clerk, Empire Gas and Fuel Co., Bartlesville, Okla.

This wrinkle consists of a piece of scrap pipe, any desired length, which has been cut to the shape of an orange peel with the points of the lips cut off to fit any size pipe wished. After which, it is heated in a forge and the lips are bent into the size pipe desired to swedge to and welded together with the Oxy-Acetylene process.



ORANGE PEEL SWEDGED NIPPLE





CROSS SECTION

TO STOP SAND-HOLE LEAK.

STOPPING A SAND-HOLE LEAK IN A 16-INCH GATE FLANGE.

J. Sullivan, the East Ohio Gas Company, Cleveland, Ohio.

This interesting wrinkle was accomplished about four years ago. The leak developed from a sand hole on the flange of a 16″ gate. It was not feasible to remove the gate, so a steel plate was formed long enough to include two of the bolt holes on the face of the flange, and formed as shown on the cross section. The surface of the flange where a strip of soft rubber was placed, received a heavy coat of shellac. It has never required any attention since it was put on.

LOYALTY—THE ESSENTIAL POWER OF MAN.

G. R. Carpenter, United Fuel Gas Co., Charleston, W. Va.

The greatest qualification a man can have is that of loyalty, yet some men will drift from it.

It requires real effort to organize a body of men to hold that principle of remaining loyal, and to have each man feel that he is not only an employe, but a part of the organization. Loyalty is nothing more than honesty.

Many times to uncover this hidden quality it requires patience and tenacity of purpose. A mass or body of men as a whole are slow to take up new ideas. The greatest building force I find is self-interest. Men are like soil to be tilled. If taken care of with touch of improvement it well pays for your trouble, but if you fail to show that interest you lose in returns.

Every man with ambition to advance should proceed on an honest and true foundation of his own merits, and to have that foremost in mind of which he aspires, and make steps for himself. Truly he is to be benefited by ideas of bigger men, but he should not try to impersonate some one else, if so, his own judgment is of less value.

A man should not be ashamed to own that he is in the wrong. There is great practical benefit in making a few mistakes and being followed up by sharp criticism. The practice of persistent loyalty shows your associates or employes your most essential purpose. With these principles you impress them with your personal interest in their welfare.

If you show interest and encourage better results, you can get them. Just as soon as men learn that you notice what they do as well as that which they do not do, you inspire ambition. Most men like a few words of praise. It is inspiring and gives them a strong mental vibration. It encourages them to take pains with their work.

TO PREVENT LONG MAPS FROM TRAILING.

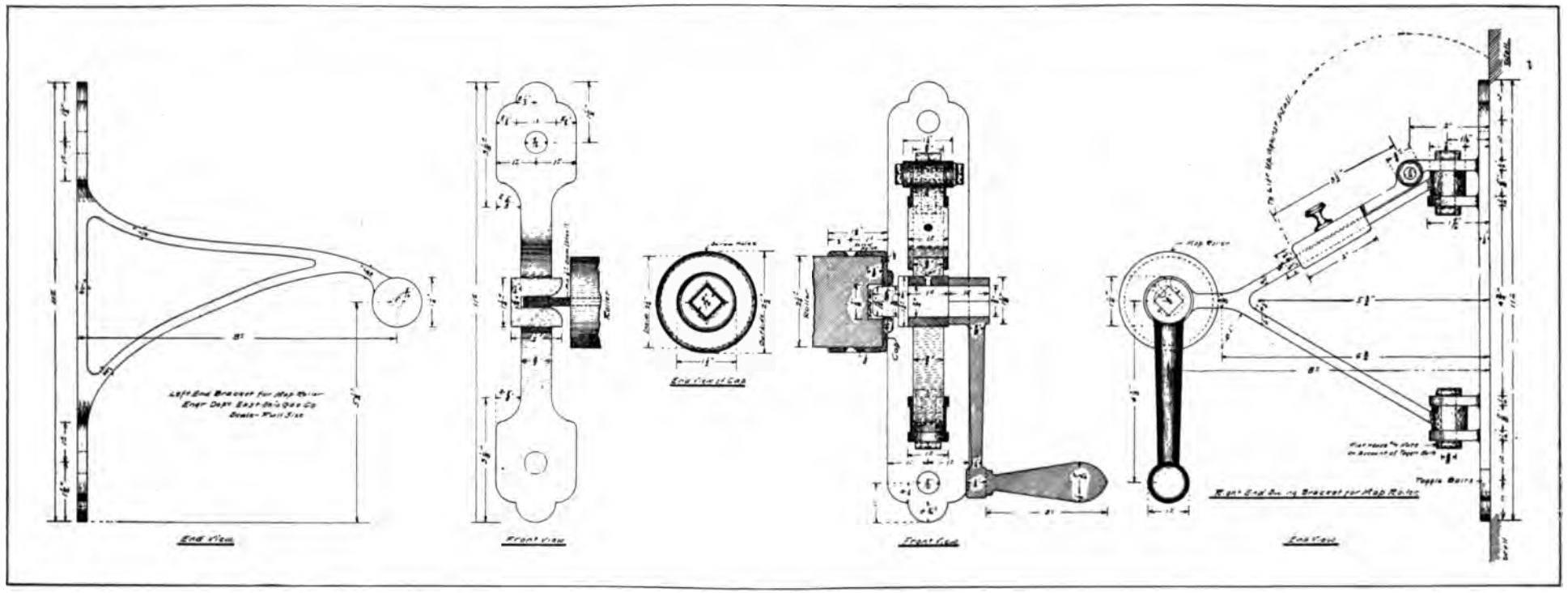
The East Ohio Gas Company, Cleveland, Ohio.

Some very large maps, more than twelve feet long, made some arrangement necessary that would roll them up at the bottom to keep them off the floor, when a view of the top of the map was desired.

The maps are arranged on the tin spring map rollers in the usual manner in the nest up at the ceiling. At the bottom of the map, we used a split cork pine cellar 2¼ inches in diameter. In the left end of the roller, a pin is driven of ¼-inch diameter. This pin enters a hole in the brass bracket at the left end of the roller. This bracket is securely fastened to the wall and does not swing. At the right end of the roller, a brass cap was put on with a ¾-inch square hole in the end of same. The bracket at the right end of the roller swings in a circle and the square end of the crank shaft meshes into the square hole in the cap on the end of the roller. A latch that drops down on the arm of the bracket holds it in the proper place. The tension put on the spring of the tin roller up in the map nest is fully strong enough to unroll and raise the map when you wish to do so. A slight jerky motion of the crank of the bracket will set the dogs in the roller above just as easy as the present way of doing it by hand.

The operator, standing near the swinging bracket, can easily stab the pin on the other end of the roller into the stationary bracket at the left end, on account of the light weight of the cork pine bottom roller, swing the right end bracket into place, drop the latch, and then turn the crank.

This wrinkle solved a problem that had caused considerable damage to the bottom of the large maps from trailing on the floor when in use.



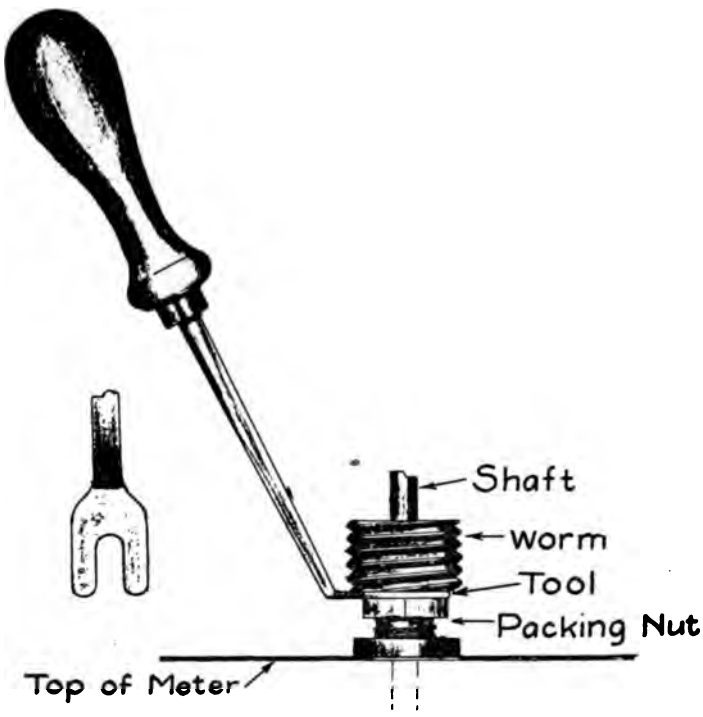
DEVICE TO PREVENT MAPS TRAILING ON FLOOR.

TOOL FOR STARTING METER PACKING NUT.

Wm. Taylor, The East Ohio Gas Co., Cleveland, Ohio.

This little tool is very handy for putting pressure on the packing nut in the top part of a tin meter, to overcome the resistance against the nut caused by the packing below.

The worm is generally of such size that it is difficult to get nut started with the fingers. This tool overcomes this trouble.



TOOL FOR HOLDING PACKING NUT

METHOD OF EXTINGUISHING BURNING GAS LEAKS.

Franklin L. Kellogg, Field Foreman, Ontario Gas Company, Honeoye Falls, N. Y.

When a leak in a buried gas line has been ignited and allowed to burn for some time, it will be noticed that whenever the flame issues from the ground, the ground and surrounding material will attain a very high temperature. By deluging this highly heated material with water, a cloud of steam will arise and smother the flame of burning gas. Where the pipe line is above ground, it is sometimes advisable to pile stones or other refractory material about the flame and wait for same to heat, before applying the water, in order to have enough heated material to vaporize the same.

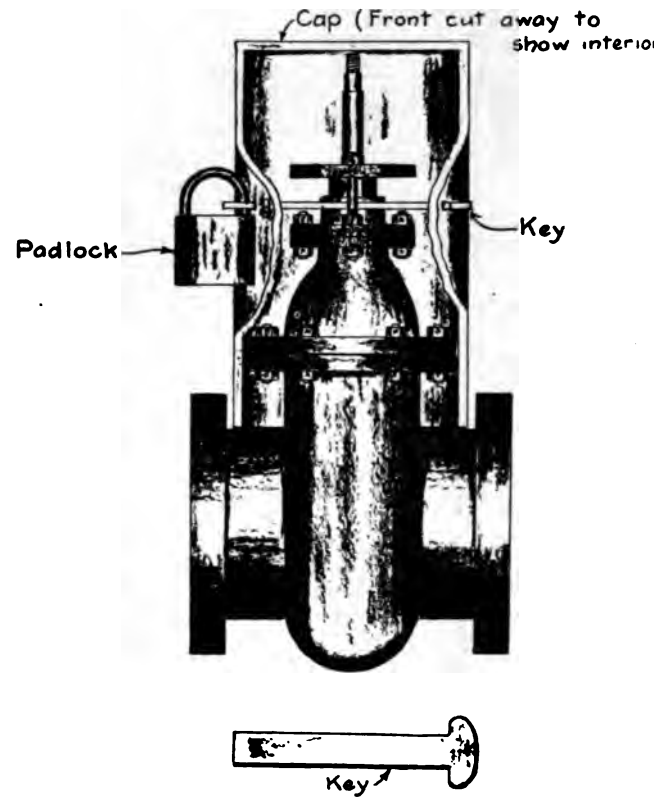
The size of the fire will determine the proper treatment. The writer has used the above method in several cases and has found it to be very simple and satisfactory.

LOCK AND CAP FOR GATE VALVES.

W. G. Hagan, The East Ohio Gas Company, Cleveland, Ohio.

This method prevents any tampering with valves.

This cap was used on an 8-inch gate valve and is made of 6-inch pipe with a cover welded on top. Slots are cut in the sides to permit the key to extend through and between stuffing box and bolt. The key is made with a "T" head and has a hole at the other end to allow the ring of the padlock to pass through.



LOCK AND CAP FOR GATE VALVES.

PREVENT REVERSING OF INLET AND OUTLET OF METER.

G. C. Reed, Telephone Foreman and Meter Inspector, Lone Star Gas Company, Fort Worth, Texas.

Place a check valve in the neck of the outlet on meter. If meter is in normal position, the flow of gas keeps this valve open. If meter is reversed to prevent the registering of gas, this check valve is closed by the pressure of the in-coming gas, thereby effectively cutting off the supply until meter is reversed in proper position. It would be almost impossible to detect the presence of this valve.

CAPACITIES OF SMALL ORIFICES.

For Testing Casing-Head Gas Wells.

Capacities given in cubic feet of 8 oz. Gas, (Gravity 1.00) per twenty-four hours.

To correct to gravities other than 1.00, use correction factor given in Table.

SIZE OF ORIFICES.

Inches Water	¼"	⅜"	½"	¾"	1"	1¼"	1½"	1¾"
0.5	980	2,210	3,950	9,000	16,360	26,600	40,900	60,650
0.6	1,070	2,420	4,320	9,870	17,920	29,050	44,300	66,550
0.7	1,160	2,620	4,670	10,620	19,360	31,400	48,400	71,000
0.8	1,240	2,790	4,980	11,350	20,620	33,550	51,550	76,650
0.9	1,310	2,950	5,270	12,010	21,840	35,500	54,600	81,100
1.0	1,380	3,110	5,550	12,690	23,040	37,450	57,600	85,700
1.1	1,450	3,270	5,840	13,310	24,200	39,300	60,500	90,000
1.2	1,510	3,410	6,100	13,890	25,240	41,000	63,100	93,900
1.3	1,570	3,550	6,340	14,460	26,300	42,700	65,750	97,700
1.4	1,630	3,690	6,580	14,990	27,260	44,300	68,150	101,000
1.5	1,690	3,810	6,810	15,520	28,220	45,900	70,550	104,800
1.6	1,750	3,940	7,030	16,020	29,160	47,400	72,900	108,000
1.7	1,810	4,050	7,250	16,510	30,060	48,900	75,150	111,300
1.8	1,860	4,170	7,450	17,000	30,940	50,300	77,350	114,600
1.9	1,910	4,300	7,660	17,490	31,780	51,600	79,450	117,800
2.0	1,960	4,410	7,860	17,970	32,620	53,000	81,550	121,000
2.1	2,010	4,510	8,060	18,410	33,420	54,400	83,550	123,950
2.2	2,050	4,620	8,260	18,820	34,220	55,600	85,500	126,900
2.3	2,100	4,730	8,450	19,250	35,000	56,900	87,500	129,850
2.4	2,140	4,830	8,630	19,640	35,760	58,100	89,400	132,400
2.5	2,190	4,930	8,800	20,040	36,500	59,200	91,250	135,200
2.6	2,230	5,030	8,960	20,450	37,200	60,400	93,000	138,000
2.7	2,270	5,120	9,130	20,850	37,900	61,500	94,750	140,600
2.8	2,310	5,220	9,310	21,250	38,600	62,700	96,500	143,200
2.9	2,360	5,310	9,480	21,600	39,300	63,800	98,250	145,800
3.0	2,400	5,400	9,650	22,000	40,000	65,000	100,000	148,100
3.25	2,490	5,610	10,050	22,850	41,600	67,500	103,000	154,100
3.5	2,590	5,820	10,400	23,700	43,200	70,000	107,800	160,100
3.75	2,680	6,030	10,760	24,550	44,700	72,500	111,700	165,900
4.0	2,770	6,240	11,120	25,350	46,200	74,900	115,200	171,400

CORRECTION FACTORS FOR GRAVITIES.

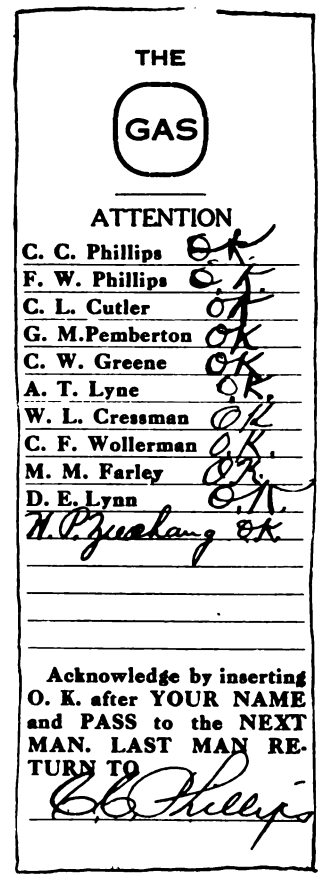
To be Used with Tables of Capacities of Small Orifices.

Gravity	Multiplying Factor	Gravity	Multiplying Factor
.70	1.195	1.00	1.000
.71	1.187	1.01	.995
.72	1.178	1.02	.990
.73	1.170	1.03	.985
.74	1.162	1.04	.981
.75	1.155	1.05	.976
.76	1.147	1.06	.971
.77	1.140	1.07	.967
.78	1.132	1.08	.962
.79	1.125	1.09	.958
.80	1.118	1.10	.954
.81	1.111	1.11	.949
.82	1.104	1.12	.945
.83	1.098	1.13	.941
.84	1.091	1.14	.937
.85	1.085	1.15	.933
.86	1.078	1.16	.929
.87	1.072	1.17	.925
.88	1.066	1.18	.921
.89	1.060	1.19	.917
.90	1.054	1.20	.913
.91	1.048	1.21	.909
.92	1.043	1.22	.905
.93	1.037	1.23	.902
.94	1.032	1.24	.898
.95	1.026	1.25	.895
.96	1.021	1.26	.891
.97	1.015	1.27	.887
.98	1.010	1.28	.884
.99	1.005	1.29	.881
		1.30	.887

"THE GAS CIRCLE."

C. C. Phillips, The Ohio Fuel Supply Co., Columbus, Ohio.

Being vitally interested in all phases of the natural gas industry, this department has formed an organization for the purpose of increasing our knowledge of this business. The members each contribute $3.00 a year to cover expense of subscriptions to various gas magazines, government bulletins and other literature of interest in this connection. All expenditures are put to a vote of the members and must have the approval of the majority. When any article of interest is read by a member it is promptly brought to the attention of all members. To be sure all members receive each magazine, bulletin or clipping, etc., the organization has had slips printed like the enclosed and nothing is filed until it has been noted and O.K.d by all the members.


THE GAS

ATTENTION

C. C. Phillips O.K.
F. W. Phillips O.K.
C. L. Cutler OK
G. M.Pemberton OK
C. W. Greene OK.
A. T. Lyne O.K.
W. L. Cressman OK
C. F. Wollerman O.K.
M. M. Farley O.K.
D. E. Lynn O.K.
H. P. Buelang OK.

Acknowledge by inserting O. K. after YOUR NAME and PASS to the NEXT MAN. LAST MAN RETURN TO C. C. Phillips

CIRCULATING GAS LITERATURE IN A COMPANY.

METHOD OF CLEANING MERCURY.

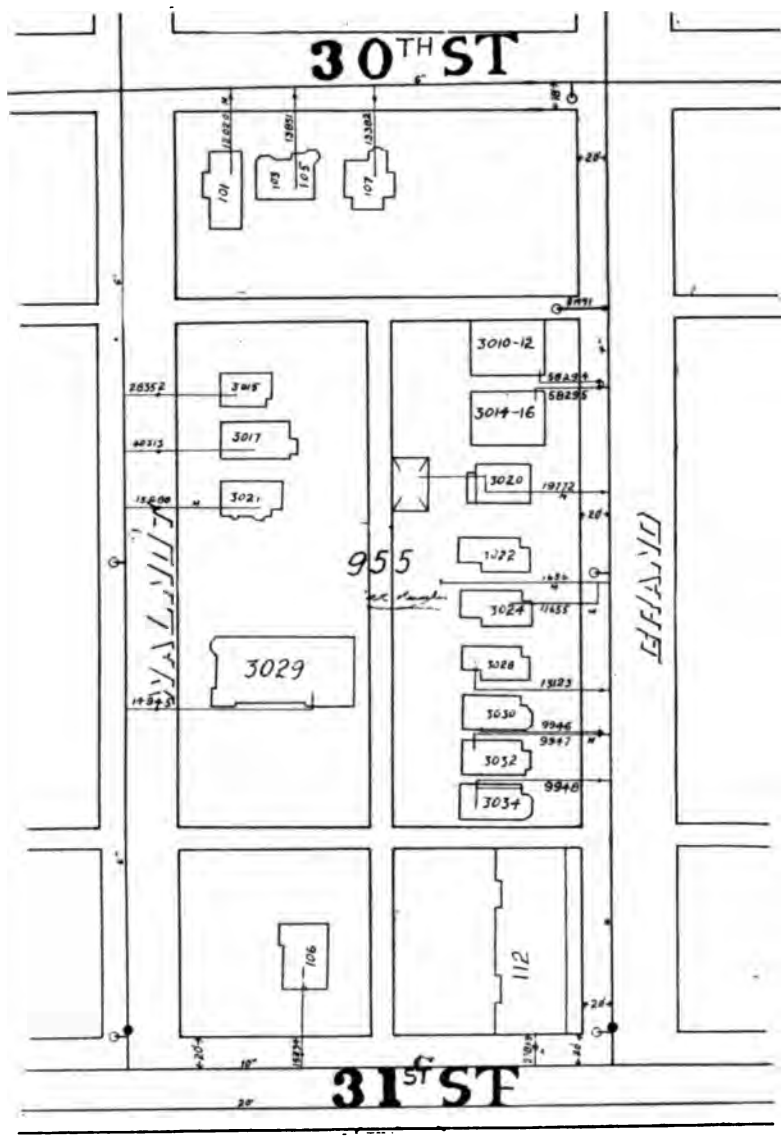
Frederick P. Doyle, Asst. Chief Engineer, Midway Gas Co., Taft, Calif.

When adjusting an orifice meter gauge, used for measuring casinghead gas, it was found that some oil had been carried over from the main gas line to the chamber containing the mercury. In an attempt to clean the mercury by using water it separated into minute globules each apparently coated with a thin film of oil. After a few washings with gasoline the mercury was thoroughly separated from the oil and the globules immediately united to form one mass of clean mercury putting it in proper shape for use in the gauge and at the same time saving it.

LOCATING ACCOUNTS FOR METER READERS.

Robert W. Goodnow, Assessor and Collector, Water Department, Kansas City, Mo.

The accompanying sketch is of a system which we have adopted to locate our accounts in our meter readers' route books and meter rate ledgers, and while it is not entirely a new idea might be of assistance to some other city or company, so we are enclosing a sketch of the same and a short explanation regarding its workings.



TO LOCATE ACCOUNTS FOR METER READERS.

We are finding this a much simpler and easier method of locating our accounts than our old method, which was done by giving an account a tap number and then a license number, locating the account by the license number. A brief description of this block system idea is as follows: We have taken a large map of the city of Kansas City and have numbered every city block: in large tracts of land have left spaces so that additional numbers can be added when the same are platted.

We start in at one corner of this city block and set up our accounts by street number; the attached drawing being a copy of our service map for block No. 955: we read down one side of the block, then read the cross street number, then read backwards on the named street and back to the point of beginning, viz:

3015 Walnut St.	1006 E. 31st.	3034 Grand.	107 E. 30th St.
3017 Walnut St.	1012 E. 31st.	3032 Grand.	105 E. 30th St.
3021 Walnut St.	then to	3030 Grand.	101 E. 30th St.
3029 Walnut St.		3028 Grand.	
then to		3024 Grand.	
		3022 Grand.	
		3020 Grand.	
		3016 Grand.	
		3012 Grand.	
		then	

If at any time a new service is made anywhere in this block, the meter rate ledger sheet and the meter readers' route sheet is printed on the addressograph and then put into the route book and ledger just where it belongs. The stencil on the addressograph, meter readers' route book and the meter rate ledger are all set up in this same order. We believe this is better than any account number or tap number system of locating these accounts.

In thickly settled districts within four city blocks, there are at times as many as 200 water meters, and sometimes even more gas meters. Kansas City has over 60,000 water services; 43,000 approximately are metered services and 3,000 are made up of public buildings, flush tank connections, fire protection services, vacant stores and houses, which leaves approximately 14,000 live flat rate accounts, and these are houses of under 8 rooms.

Sample of Addressograph Plate

R. W. GOODNOW
MAIL TO CITY HALL

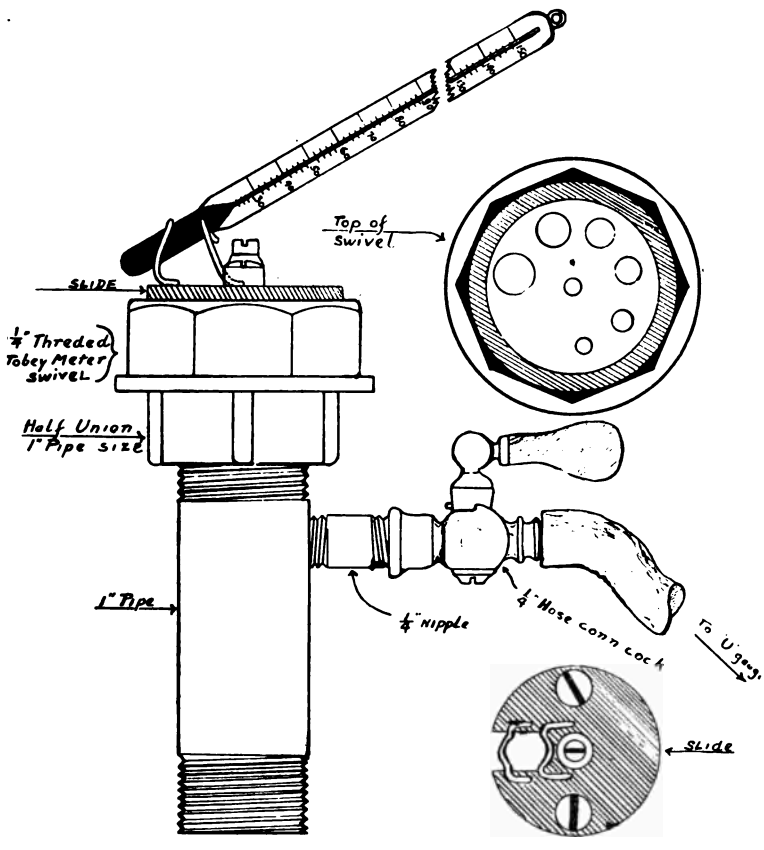
Block No. — 785 635 SCHAEFER AVE.
Tap. No. — 59444.

ADJUSTABLE METER PROVER CHECK.

J. J. Buchanan, Foreman Meter Repair Dept. Manufacturers' Light & Heat Co., Pittsburgh, Pa.

I hand you herewith a sketch and description of "wrinkle" adjustable meter prover check.

The adjustable meter prover check is easily made and the material required will be readily found in any meter repair shop. The important part or feature of the check is that the disc is readily adjustable to any flow required, it also has thermometer holder, and hose cock connection on side to register the drop pressure. We use them in our meter repair shop and have found it very convenient.



Adjustable Meter Proving Check
J. J. Buchanan
Mfrs. Lt. & Ht. Co, Pgh, Pa.

ERECT SIGNS TO SHOW LOCATION OF LINES.

H. P. Zieschang, The Ohio Fuel Supply Co., Columbus, Ohio.

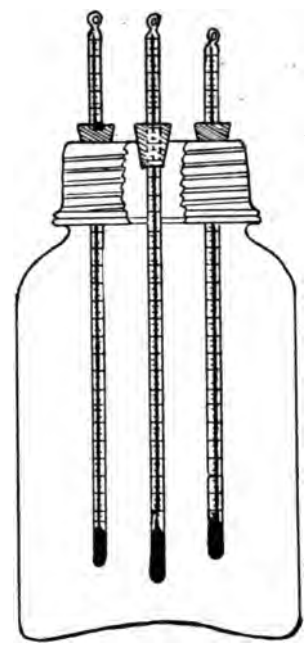
In walking lines in a strange district it is very difficult to find the line especially where the land is plowed every year.

I suggest, that when a line is constructed, that a board be nailed on the fence and painted white and the name of the line and property line painted in black.

This would be helpful to any man working on the lines for repair work, etc.

THERMOMETER COMPARISON CHAMBER.

J. H. Schalek, Mfrs. Light & Heat Co., Pittsburgh, Pa.



THERMOMETER COMPARISON CHAMBER
J.H. SCHALEK – Mfrs. Lt. & Ht. Co. - Pgh., Pa.

Although the thermometers used in proving house meters need not be of scientific accuracy, they should, however, register within a quarter of a degree of each other when immersed in a fluid of uniform temperature. The chamber as shown in the drawing is a quart size fruit jar with holes cut in the cap for ¾" corks or rubber stoppers. Each stopper has a hole bored through it and small enough to grip the thermometers tightly. By filling the chamber with hot water and making a record of the thermometer readings at 10 or 15-minute intervals the unreliable thermometer can easily be found and rejected if the variation is in excess of that recommended above.

AUTOMATIC MULTIPLYING DEVICE.

H. G. Matheny, The Logan Natural Gas & Fuel Co., Lancaster, Ohio.

This device is especially designed for figuring Pilot Tube extensions, or other work where we have a fixed multiplier. This simple device has been used very efficiently in the office of The Logan Natural Gas & Fuel Company, at Lancaster, Ohio, for several months.

Figure 1 shows the device arranged for the co-efficient of a certain Pilot tube which is "3.4176" figuring the equivalent in cubic feet of 7,529,099 inches, which would require the following problem by multiplication:

7,529,099.
3.4176

By the means of this device we merely turn the rollers to where the marginal figures appearing represent the inches to be figured as follows:

Material and Construction.

A—1 and 2—End pieces—2 boards 1¾" x 3" x ¼" thick.

B—Bottom piece—1 board 2½" x 8½" x ¼" thick.

C—Side piece—1 board 1¾" x 8½" x ¼" thick, with ⅞" holes bored through.

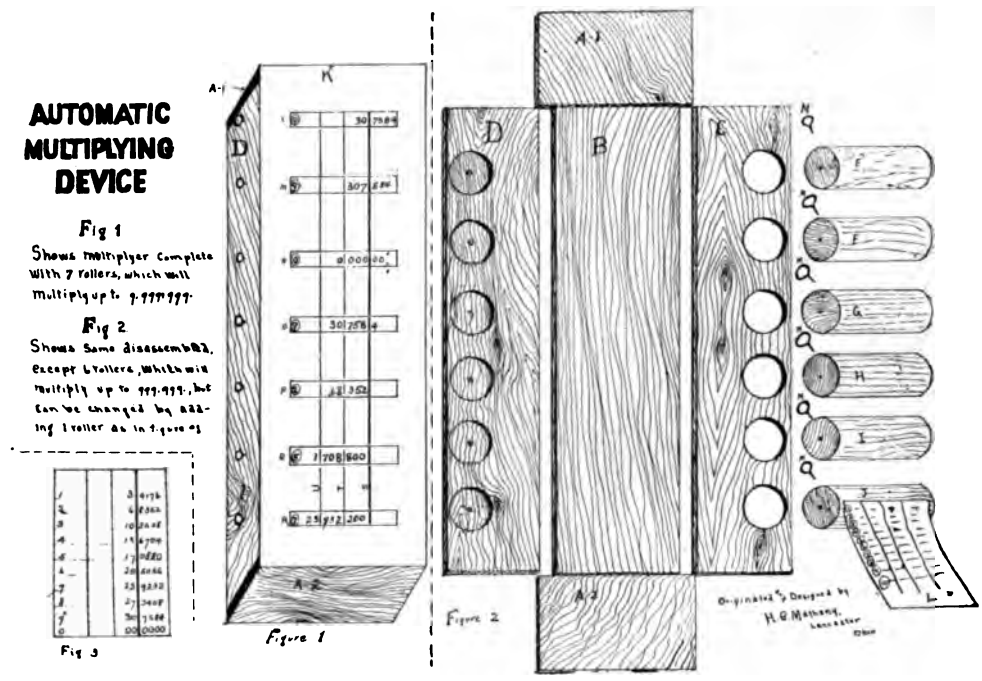
D—Side piece—1 board same size as "C" but with holes bored *nearly* through.

E, F, etc.—Wood rollers 2—⅞" x ⅞" diameter (made of ⅞" curtain poles).

K. (Fig 1) Tracking cloth—3" x 9", ruled for comas and decimal points, and strips cut out over each roller.

L—Strips of paper 2" x 3", ruled for comas and decimal points (See S. T. and V. Fig. 1), also (See Fig. 3), also see "Roller Slips".

M—Screw Eyes to hold rollers in place and to enable operator to turn the rollers to desired position.



AUTOMATIC MULTIPLYING DEVICE.

The 1st roller (L. Fig 1.) represents what 1 to 9 inches equal—in this instance "9"

The 2nd roller (M. Fig. 1) represents what 10 to 90 inches equal—in this instance "90"

The 3rd roller (N. Fig. 1) represents what 100 to 900 inches equal—in this instance "0"

The 4th roller (O. Fig. 1) represents what 1000 to 9000 inches equal—in this instance "9000"

The 5th roller (P. Fig. 1) represents what 10000 to 90000 inches equal—in this instance "20000"

The 6th roller (Q. Fig. 1) represents what 100,000 to 900,000 inches equal—in this instance "500,000"

The 7th roller (R. Fig. 1) represents what 1,000,000 to 9,000,000 inches equal—in this instance "7,000,000." Then add.

Roller Slips.

The paper for roller "E" should be made up as follows: Place figures 1 to 9, at even intervals, on the margin, leaving ¼" space at the top for aid in gluing to roller. Opposite the figure 1 should be the multiplier, opposite the 2 twice the multiplier, opposite the "3" three times the multiplier, etc., down to 0 (See Figure No. 3).

The paper slip for "F" should be the same, except to point off one less decimal, or add one cipher as the case may require, but keep the decimal point in a perpendicular line with "E."

The remaining rollers are treated the same, pointing off one less decimal, or affixing one more cipher. Study the 9s appearing in figure 1.

MAGNETIC-AIR-WHISTLE, FOR TELEPHONE ALARM, FOR USE IN GAS COMPRESSING STATIONS.

W. E. Nester, Engineer the Manufacturers' Light & Heat Co., Waynesburg, Pa.

Considerable difficulty is at times experienced by the City Office and Pressure Stations in securing telephone connections with the Compressing Stations, on account of the noise in the engine room.

Gongs are objectionable in the compressor building on account of the ever present danger from the spark which they make while ringing. Klaxon Horns, while an improvement over the gongs are not reliable, due to the commutator becoming rough from frequent use, or brushes sticking, failing to operate successfully. And while they are usually encased, they are not entirely gas proof.

The accompanying sketch shows the general arrangement of a very dependable alarm which the writer constructed to overcome the objections of the Gong and Klaxon.

Taking a discarded electro-magnet (1) that was formerly used for operating a revolution counter on the compressor engines, we mounted it on a piece of 1" oak board 10" x 16" and directly below mounted a standard ⅜" whistle valve (6) one end of which was connected with the air supply used for starting the Compressor engines, the other being connected to a line running to a 1½" chime whistle (7) mounted on the gauge board.

Lever (5) on the whistle valve, and arm (3) of the electro-magnet were connected by rod (4).

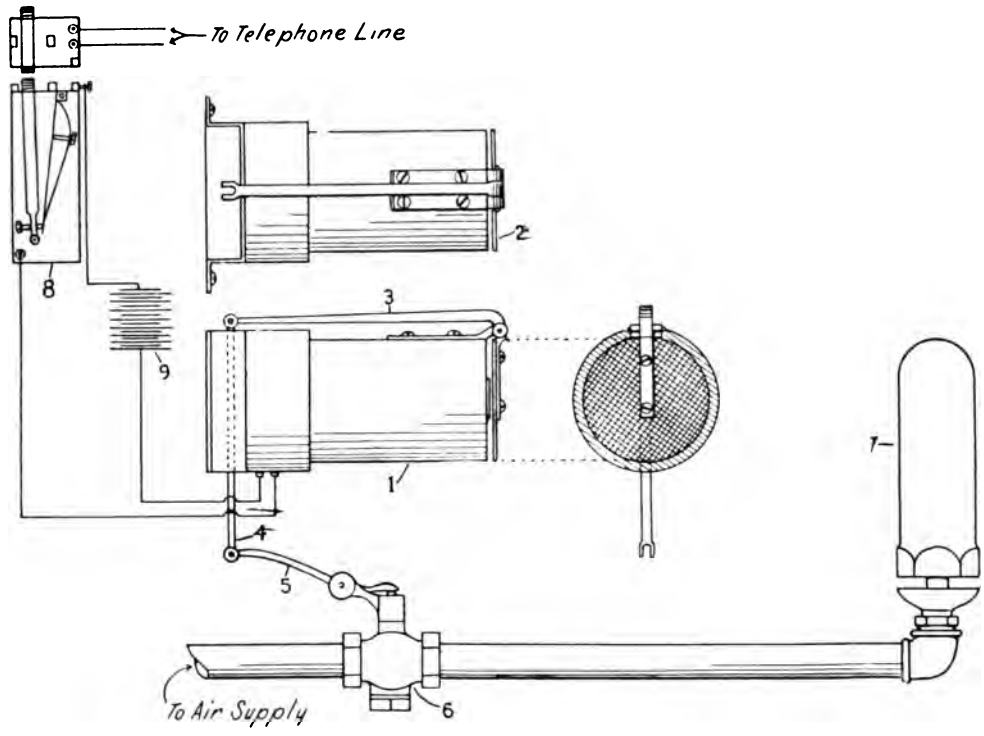
Electrical connections were then made from the electro-magnet (1) to the batteries (9) and telephone relay (8) current is taken from the storage batteries used for ignition on the Compressor Engines.

When the telephone rings the relay closes the circuit between the batteries and electro-magnet, magnetizing the iron core with the latter, causing the steel plate to be drawn in, and raising arm (3) which in turn lifts lever (5) and opens whistle valve (6) allowing air to pass from storage tank to whistle.

If carefully constructed this device will be found to be a very dependable alarm, as there are no adjustments to make after it is installed, no danger from electric sparks, and the whistle responds almost instantly to each ring of the telephone bell.

The chime whistle makes a pleasing sound that can be heard at any point in or near the station, regardless of the noise in the engine room, and there is no misunderstanding the number of rings on the phone, as the alarm is distinctly sounded at each ring of the bell.

The Electro-magnet and whistle valve can be mounted at any convenient place, and the whistle placed on the gauge board if desired, but quicker response at the whistle will result if they are kept near each other, on account of the time intervening between the opening of the valve and air reaching the whistle.



TELEPHONE ALARM.

SUGGESTED USES FOR THE METER ORDER.

Maurice J. Adams, Fort Worth Gas Co., Fort Worth, Texas.

When properly used ,the original order to connect or disconnect a meter may be made the basis for a number of operations both in office and shop. This means a saving of a considerable amount of time lost in transcrib-

ing information contained on the order to other records. As records vary with different companies and systems differ according to whether number of consumers be many or few, no one outline can be given to cover all cases, but some definite routine should be worked out to fit individual needs along the line of the suggestions following.

SUGGESTIVE OUTLINE.

All orders should be numbered consecutively, should contain space for name, address and remarks. A column should be provided on the left for meters connected and one on the right for meters disconnected, with ruling to show number, make, and size, as well as state of the meter. Lines at the bottom of the order should provide space for entering folio and line in consumer's ledger on which entry is made as well as folio in meter index in which meter location is recorded. Such a form would appear somewhat like this:

BLANK GAS COMPANY

Blankville,..... 191.. No. 13702

Connect Meter	Disconnect Meter
For	For .....
.....Street	.....Street
Deposit No.... Amt.....	
Connected Meter No.....	Disconnected Meter No..
Kind	Kind .....
State	State .....
Date	Date .....
.....	.....
Fitter	Fitter
Ent'd Ledger, fol... line..	Ent'd Ledger, fol... line..
Ent'd Meter Index, fol...	Ent'd Meter Index, fol...

After order is filled out from application at office, it should go to the operating department and be distributed to the various fitters according to sections of the city covered by them. After order is completed by the fitter it is returned to the shop. In case any shop records are kept, this would be the proper time to make the entries in them. If none are kept, the order is returned at once to the office.

Here the orders are distributed to the clerks having charge of the various consumers' ledgers. A street index to the ledgers will facilitate this distribution. Entries are then made in the ledgers and folio and line notations made on order in space provided for that purpose. In case a disconnect order is entered for a person moving to some other address on the ledgers, the debit or credit balance remaining should be noted on the reverse thereof to be transferred to the new account later.

In case an addressing machine and equipment are used the orders should then go to the clerk attending to that feature in order that new addresses may be set up and "dead" ones be discarded.

The orders should then be arranged in order according to meter number and entered in the meter index. States at which meters are set should be carefully checked against the disconnect state at last address in order that any errors in reading the meters may be detected. Folio of meter index should be noted on the order in the space provided.

After being entered in the meter index, the orders should be separated into three classes. Connect orders covering consumers lost in a second, and both connects and disconnects covering persons changing meters from one address to another in a third.

Where meter deposits are required, they should be written on the connect order from the application at the time the order is first issued. These connect orders should now be arranged in order according to folio and line of the ledgers and entered therein. In order that all deposits may be entered, it is well to keep a consecutive list of the deposit numbers and check each deposit off as it is entered.

Connects and disconnects covering persons changing addresses are then sorted according to the order number. This will bring the connect and disconnect for each party together and they should be paired off and fastened together with some temporary paper fastener. The debit or credit balances noted on the reverse side of the disconnect should then be entered in a journal for that purpose crediting the account in full at the old address and debiting it at the new. This will cause all unpaid balances to show at the current address and insure prompt collection or "cut off" before a large bill becomes due. In case postings to the different consumers' ledgers are kept by separate totals, a columnar journal can be used to keep transfer debits and credits in like manner.

These connects and disconnects can then be used to transfer the deposit numbers and amounts to the new addresses in like manner. The deposit can be ruled off at the old address and entered on the reverse side of the disconnect order and then checked off when entered at the new address. In case a number of deposits are transferred at one time, it is well to arrange the disconnects by folios and lines and rule all of them off the ledger (making notations on the back as directed) and then reverse all pairs so that the connect orders will appear on top when orders can again be assorted according to connect folios and lines and then all entries can be made at one time.

As no further transactions are necessary on the disconnects covering accounts lost, all three classes of orders are now ready for final assortment according to original numbers of the orders themselves and are then ready to be filed away for reference and audit.

Any system not containing all of the features listed above can omit any step at its proper place and let the order pass on to the next step, and any having other features not mentioned should find the proper time for their execution and insert an additional step at that point.

To insure the orderly flow of the orders through these steps, it is well to take a roomy drawer in some convenient desk and divide it into partitions, labeling them according to the different steps to be taken. As each clerk completes work taken from one division, he places those orders in the next division ready for another clerk. This shows how far any order has advanced at any time regardless of sickness or absence of any clerk and prevents omission of any step with any order.

The above suggestions have been put into practice and their worth proven. They can easily be modified to suit any number of consumers and can be easily installed at practically no expense. The advantages of such a system are readily apparent and should be passed on to others at every opportunity—hence this brief description.

METHOD OF USING HOT FLUE GASES TO DRY BRICK.

W. T. Roberts, C. W. Cramer, Engineering Department, Arkansas Natural Gas Company, Little Rock, Arkansas.

Four, 125 H. P., return flue, boilers have their breechings connected in one conduit, leading to the brick dry house. In conduit is placed a large fan which creates the necessary draft and forces the hot gases into the drying tunnels. This method is an efficient fuel saver.

To Mr. W. W. Dickinson, Jr., of Little Rock, Arkansas, must be given the credit for the above installation.

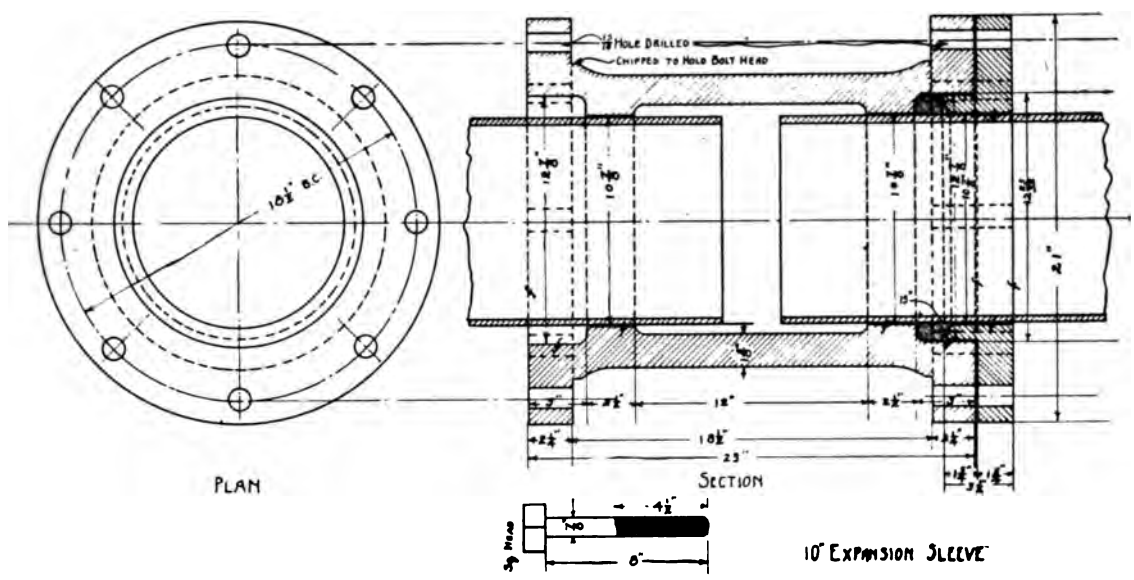
10-INCH EXPANSION SLEEVE MADE IN KANSAS.

J. A. Remler, Kansas Natural Gas Co., Independence, Kansas.

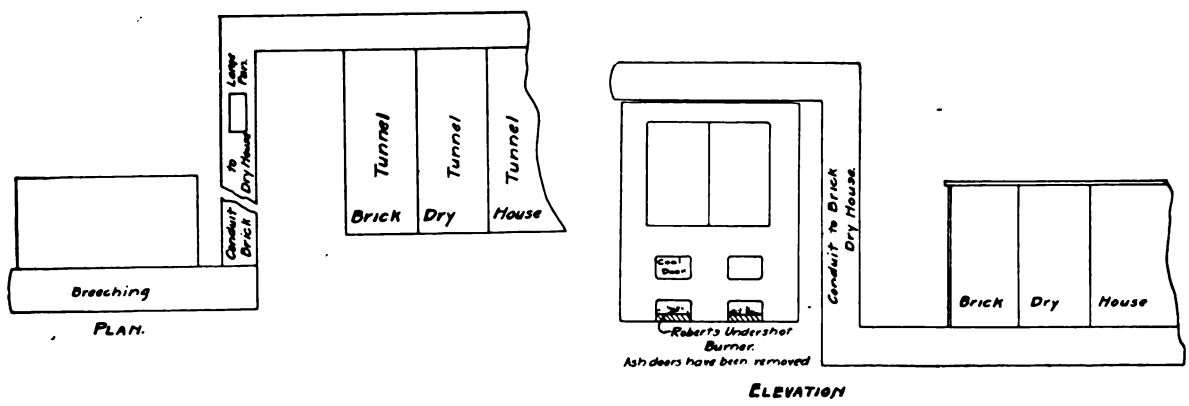
The accompanying drawing is of a ten-inch expansion sleeve of our own make which we have put in service on the discharge lines at Petrolia Station.

We have experienced several blow-outs on the discharge lines at Petrolia Station where they enter the cooler, due to expansion in the cooler, and this expansion sleeve has eliminated all of this trouble.

This is not a new wrinkle, being just an expansion sleeve of our own make, the patterns for the casting being made at our plant, and may be of interest to the readers of this department.



TEN-INCH EXPANSION SLEEVE.



Method to Utilize Hot Flue Gases to Dry Brick.

The expansion at the point where this sleeve is used is about three inches, and many times pulling the threads out of the flange, and sometimes breaking the flange or pulling the threads out of valve connection.

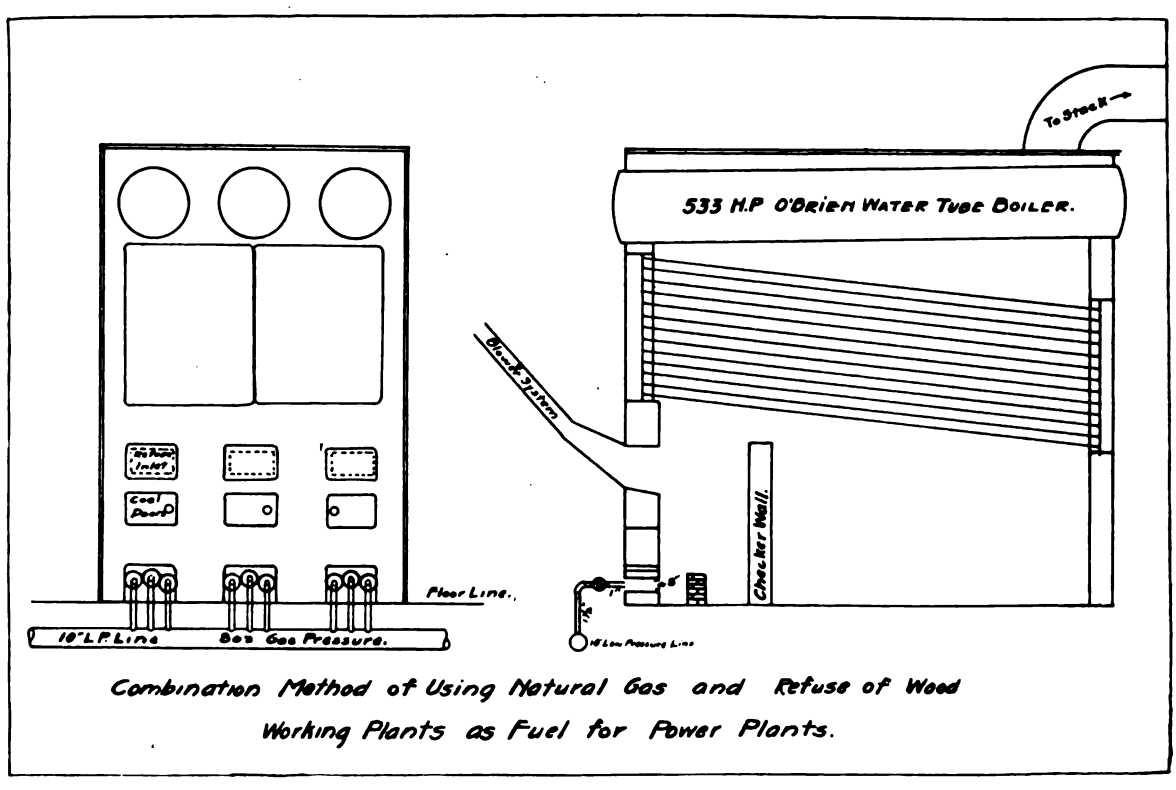
The stuffing box on this sleeve is packed with a high grade woven asbestos.

FUEL FOR POWER PLANTS.

W. T. Roberts, C. W. Kramer, Engineering Department, Arkansas Natural Gas Company, Little Rock, Arkansas.

This sketch shows the method employed in burning natural gas and refuse, consisting of saw dust, shavings, chips and small blocks, from wood working shops, as fuel in a power plant. The gas is supplied through a 10-inch low pressure header in the subject sketched, from which it goes through a 1½-inch pipe reduced to 1 inch. The gas flows to the mouth of the 8-inch port in front of the boiler, from whence it is pulled with air into the furnace against a wall to "break up" and mix same completely for combustion.

In this installation the refuse from the shops is conveyed a distance of five hundred feet to the boilers, by means of a blower system, having an 8-ounce suction, which delivers the refuse directly into the fire box, where it is completely consumed, very materially lowering the fuel cost. No ash remains to cause trouble, as it is reduced to powder form and goes out the stack.



Combination Method of Using Natural Gas and Refuse of Wood Working Plants as Fuel for Power Plants.

PRINTED NOTICES.

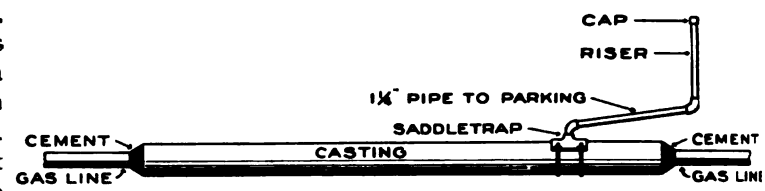
V. A. Goble, The East Ohio Gas Co., Ravenna, Ohio.

Printed notices informing the consumer of violations of Gas Company Rules: that is, hose connections, appliances without flue connections, etc. These notices to be handed out by meter readers, fitters and other employes, when they come in contact with any violations.

Also a printed card from the Gas Company to inform plumbers, pipefitters and contractors, as to the correct size of pipe to run to the last outlet, and also the proper size of risers to the second or upper floors.

LEAK DETECTOR FOR GAS LINE IN CASING.

H. H. Harrington, Citizens' Gas & Electric Co., Elyria, Ohio.



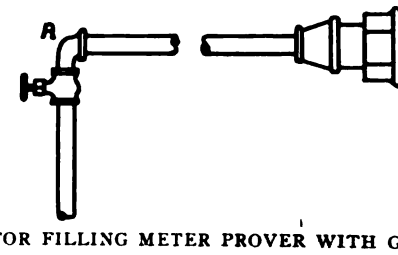
LEAK DETECTOR.

Tap casing at highest point, saddle and run 1¼" line to parking in the clear, with riser and cap. By taking cap off can readily tell at any time if line is leaking in casing.

FILLING METER PROVER WITH GAS.

J. R. Gilbert, Fort Worth, Texas.

This connection is used at large hose opening of prover, and by means of loosened street ell at (A), can be swung back out of the way when necessary to use the prover for large meters.



FOR FILLING METER PROVER WITH GAS.

TESTING LONG SECTIONS OF WELDED STEEL LINE.

Fred Dooling, The East Ohio Gas Company, Cleveland, O.

The accompanying picture shows a stationary air compressor mounted on a wagon and driven from the rear

TESTING WELDED SECTIONS.

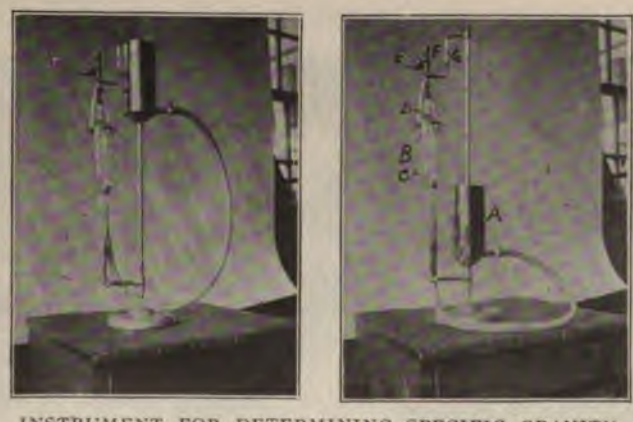
wheel of a truck. This method of testing the line with air was resorted to on account of a breakdown in our regular air testing equipment.

INSTRUMENT FOR FINDING SPECIFIC GRAVITY.

Chas. E. Pratt, Foreman E. E. Shop, Equitable Gas Co., Pittsburgh, Pa.

It is very compact and can be carried in a small grip. All parts are detachable.

In using this instrument, there is no danger of mixing air with your gas when you are timing for gas.



INSTRUMENT FOR DETERMINING SPECIFIC GRAVITY.

There is a movable water tank (a), this can be raised or lowered as desired, when up it is held by a spring stop.

The water bottle (b) is connected to the tank by rubber tubing, on the water bottle are two red lines, one on body at bottom (c), one on the neck at top (d).

These marks are used for timing the discharge of air or gas.

The hose cock (e) is used for filling the instrument with gas. By leaving the hose in place you are sure that no air can get in with the gas.

The orifice connection (f) where the gas or air is discharged from the bottle, there is a valve connected to this, which you operate each time you wish to time the gas or air.

The sleeve connection (g) is used to disconnect the two parts of the instrument for packing.

The instrument can be made with very little cost compared with other S-G instruments, and will save time in operation.

USE FOR PIPE COUPLING RINGS.

J. J. Griffin, District Supt., Wichita Pipeline Company, Iola, Kansas.

Pipe saddles are used everywhere for repairing leaky lines, tapping high pressure lines and for many other purposes. Most gas-men use either a rubber gasket or sheet lead between the saddle and the outside of the pipe and they will admit that neither exactly answers the purpose. The writer has found that the rubber rings from pipe couplings are just the thing. They are good and heavy, made of an excellent grade of rubber and the bevel of the rubber makes it fit very nicely.

THAWING OUT FROZEN GAS LINES AND GAS SERVICES.

J. P. Laughlin, Foreman, The East Ohio Gas Company, Akron, O.

During the past winter we were obliged to thaw out a number of frozen services and frozen gas mains and found that it could be very easily done by the use of a small portable high pressure steam boiler and a ½" steam hose. After a portion of the gas pipe has been exposed and cut apart the ½" steam line is pushed through the gas line and it thaws its way through very easily.

TEMPORARY REPAIR OF LEAKY LOW PRESSURE PIPE.

Murray Strong, Foreman Arkansas Natural Gas Company, Arkadelphia, Arkansas.

Clean the rust and dirt from the pipe around the leak and paint with white lead. Place a rubber patch over the leak and wrap tightly with a fine nickel or copper wire, just as a broken baseball bat would be repaired.

This method is a quick way of making temporary repairs of leaks in low pressure lines.

The law: It has honored us; may we honor it.—Webster.

PIPE COUPLER SUPPORTS.

M. F. Collins, Border Gas Co., Laredo, Texas.

The photograph shows the pipe coupler support, which will give some idea as to how we prevent expansion and contraction by covering a joint occasionally with dirt, and again how we resist pressure from a stream where the line crosses a slight arroya.

PIPE COUPLER SUPPORTS.

SHEET METAL PATTERNS FOR MAKING WELDED FITTINGS.

Engineering Department, The East Ohio Gas Company, Cleveland, O.

PATTERNS FOR WELDING.

The accompanying photograph shows some of our sheet metal patterns for making welded fittings. When making a "Y" for instance, the proper pattern is placed over the pipe, so that the welder can mark off the hole which he is required to make in it. He uses another pattern to mark off the lateral on the proper bevel.

DRAWING PIPE SECTIONS TOGETHER.

J. W. Sullivan, The East Ohio Gas Company, Cleveland, O.

The accompanying photograph shows an easy

PREVENTING EXPANSION AND CONTRACTION.

method of drawing two long sections of welded steel pipe together, so that the last weld can be made. A chain hoist of suitable capacity is connected to one section of the pipe and the lifting chain is connected to the other section, so that the workmen can draw them closely together.

APPARATUS FOR DRAWING TOGETHER WELDED SECTIONS.

The brain may devise laws for the blood, but a hot temper leaps o'er a cold decree.—Shakespeare.

METHOD OF TAPPING LARGE GAS MAINS.

M. W. Walsh, Supt. Gas Dept., Louisville Gas & Electric Company, Louisville, Ky.

The accompanying drawing illustrates a method of tapping large cast iron mains, low pressure gas, without the use of expensive tapping machine, or the use of bags and running by-pass pipes around connection to be made, as is frequently done.

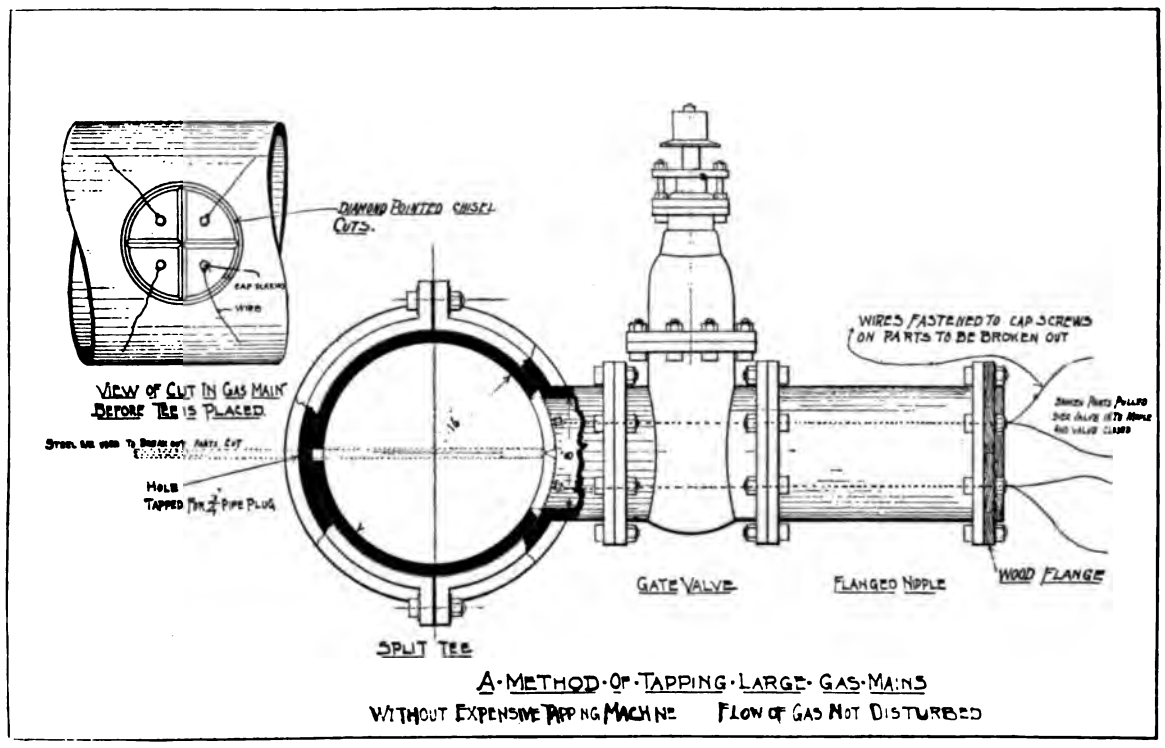
The object is to make connection without disturbing the flow of gas.

Size of cut required is marked off on main and diamond pointed cuts made as shown on drawing. Split tee is bolted around main in proper place and joints poured and calked; gate valve is placed, then flanged nipple with wood blind flange.

Tap and thread hole for ¾" pipe plug through tee and main as shown. Fasten wires to cap screws in the four parts of pipe to be broken out, extend these wires through valve and then bore holes in wood flange extending wires out far enough to be able to pull.

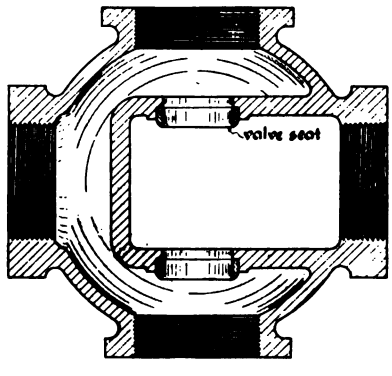
The pieces in cut are broken out by inserting a steel bar in hole and striking with sledge. The parts cut fall out with little hammering.

The ¾" hole is plugged up and gate valve closed after broken parts are pulled over into nipple.



REPAIRING VALVE SEATS IN REGULATORS.

Fred Dooling, The East Ohio Gas Company, Cleveland, O.

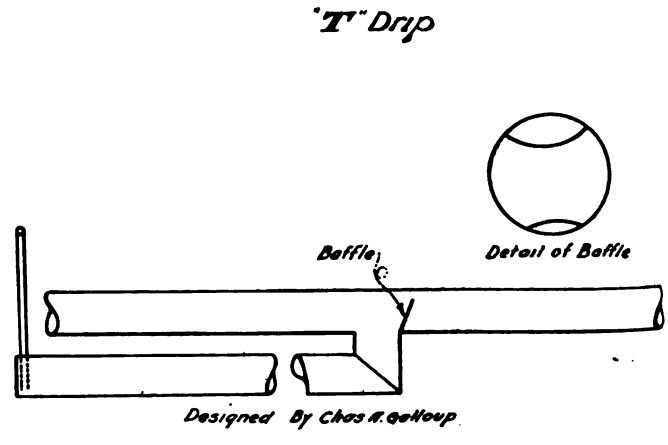


CUTTING OLD VALVE SEAT TO DRIVE IN NEW VALVE SEAT

The old valve seat is cut away and a recess machined in the body of the valve, so that a new valve seat can be driven in.

T-DRIP, WITH BAFFLE.

Designed by Chas. A. Galloup, Connection Superintendent, Empire Gas & Pipe Line Company.



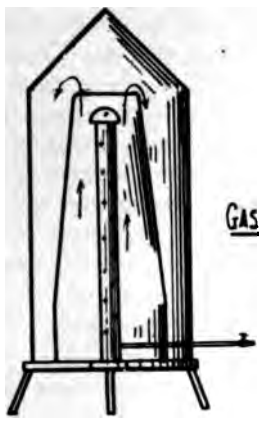
This drip is made entirely by the welding process and has been found to be very practical in handling water or gasoline.

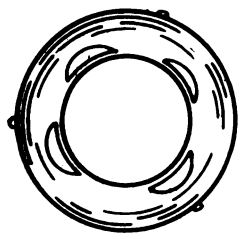
The true, strong and sound mind is the mind that can embrace equally great things and small.—Johnson.

GAS HEATERS FOR WAREHOUSE, ETC.

Designed by E. F. McDaniel, District Superintendent, Wichita Natural Gas Company.

This stove is made of two pieces of junk pipe and is found to be very safe and a good heater.





Designed by E.F.M. Daniels

STEEL FORM FOR CEMENTING PIPE LINE.

Ed. Canny, Kansas Natural Gas Company, Columbus, Kansas.

The drawing which Mr. Canny has submitted seems to need no description. He has used the form with great success.—Editors.

COMBINATION LEASE RENTAL CHECK AND RECEIPT.

S. B. Kelly, Arkansas Natural Gas Company, Little Rock, Arkansas.

This form of check and receipt combined was devised and adopted to do away with the expense incurred in the old method of hand payment of rentals.

Note that it is intended to be mailed either direct to lessee or to named depository. The reverse side has the caption: "Endorsement Below Is Receipt in Full Payment of Rentals Due," consequently have a perfect receipt.

Form L-D 1

ARKANSAS NATURAL GAS COMPANY

Lease No..... No. 29
Voucher No.....
Check No..... Little Rock, Ark.....191..
Pay to the order of.....
For credit to the amount of.....$.....
....
in full payment of rental from.....191.. to.....191..
on....acres of land leased for oil and gas purposes by.....
to .....dated.....191.. and
County,
situate in..... State of.....
Parish,

To COMMERCIAL NATIONAL BANK, SHREVEPORT, LA.

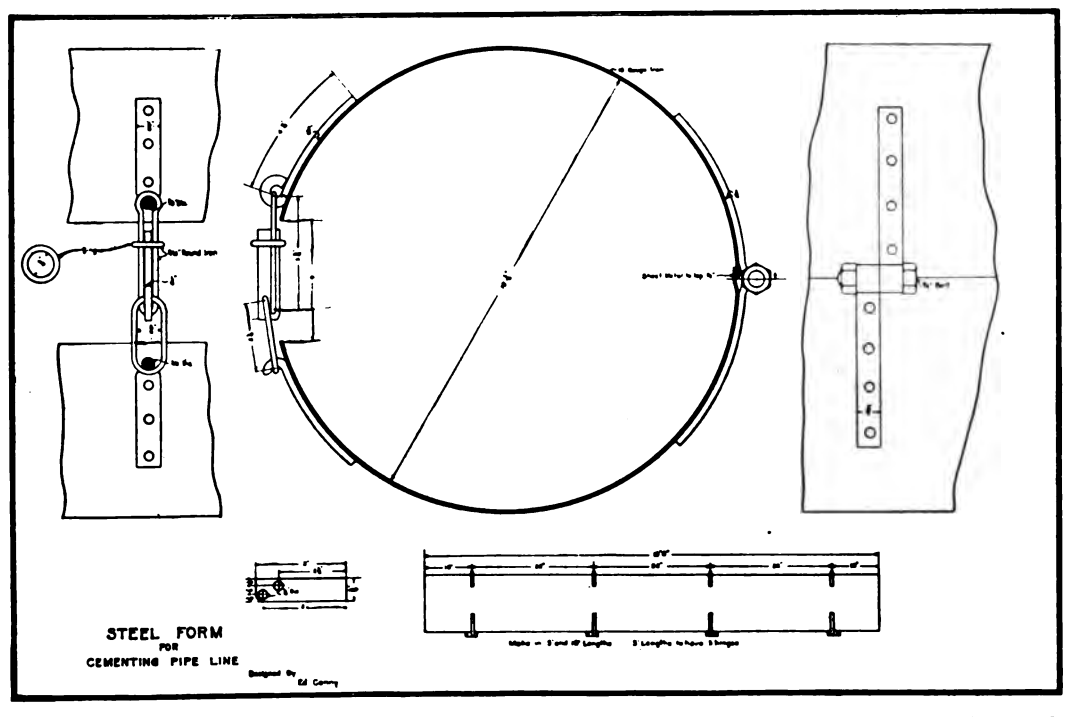
ARKANSAS NATURAL GAS COMPANY

.....
Auditor.

WEDGING OFF GAS LEAKS IN TRUNK PIPE LINES.

H. J. Truscott, Foreman, East Ohio Gas Co., Loudonville, Ohio.

I have found that lead wedges such as are commonly used by builders of monuments, are more efficient than wooden wedges, for gas leaks in trunk pipe lines. These lead wedges come in strips and taper from zero to 3/8".



Men are never so likely to settle a question rightly as when they discuss it freely.—Macaulay.

PROCESS FOR PLUGGING OFF BOTTOM WATER.

J. J. Schubert, Supt. Muddling Dept., Empire Gas & Fuel Company, Augusta, Kansas.

It is a known fact that the great majority of oil wells in most fields, are drilled too deep into the oil sands, thereby penetrating the water-bearing sand which lies below the oil-bearing strata.

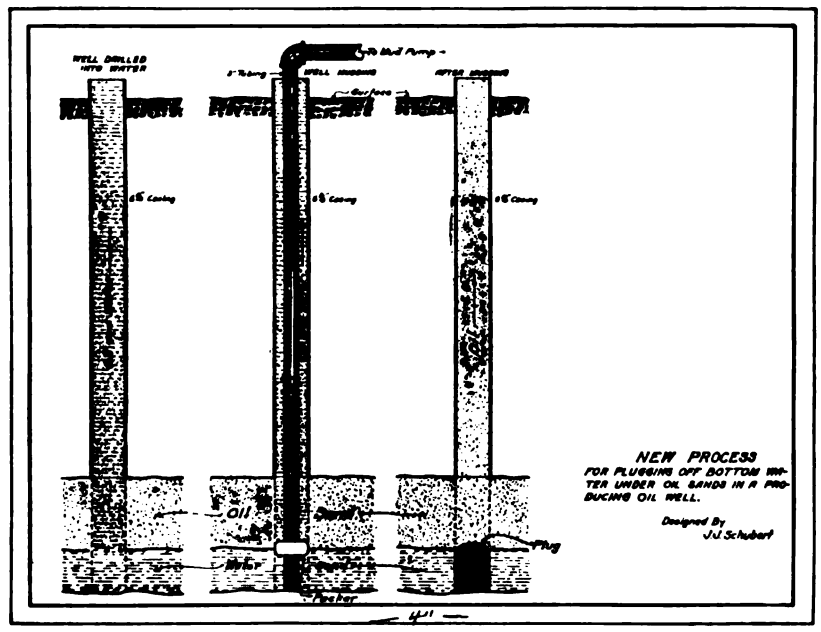
The cause for drilling so deep into the oil sands can be attributed to the producers' expecting a greater increase of oil production by further penetration, only to find that the water sand has been reached.

When a producing well is drilled into the water sand the water pressure is released, and therefore raises up in the hole, where it is found to follow the least resistance, leaving the oil-bearing sand above it exposed to the water pressure. In the case of a 2,500 foot hole it has been found to rise to a 1,400 foot level, equal to a static water pressure of about 630 lbs.

In the soft and loose sand wells, the following process of mud fluid has been successful used in a large number of wells. This process being originated through various experiments made by the Muddling Department of the Empire Gas & Fuel Company, of Kansas, under the supervision of the writer in the Butler County, Kansas, fields.

For example: A 2,500 foot well was drilled into the oil sand 60 feet. Now. in drilling the last 10 feet of a total depth of 2,460 feet, the production ceased flowing, and decreased materially, and the well showed that it was making water in large quantities, which denoted that the last 10 feet evidently was a water sand, (the latter can be determined by observing the sand cuttings in most cases) and the water pressure had raised the water above the oil sand, and retarded the oil production

By running 2-inch or 3-inch tubing with a common tubing packer set at 2 450 feet, with 10 feet of perforated anchor on the bottom of the packer, it will pack



PLUGGING OFF WATER UNDER OIL SANDS.

This static water pressure of 630 lbs. upon the oil-bearing sand. not only retards the flow of the oil, but simply floods the oil-bearing strata with a water pressure, which, due to the static pressure, drives the oil back into the sand, as the static pressure of the water overcomes the pressure of the oil, hence the well is then termed a "water well" without any more oil production.

The old method of plugging bottom water off under the oil-bearing sand, (where the well was drilled into water) has been to concrete the bottom sand, using cement, also by driving lead plugs. wood plugs, iron, and various patent plugs. Most of these methods have not been successful.

The cement process has been very successfully used in a great many places but only where the sands are close. Where the sands are loose and soft, cementing has not proved to be successful.

off the water sand under the rubber of the packer, and then start pumping a light mixture of mud fluid on the inside of the tubing, which will then enter the water sand under the packer through the perforated pipe.

It is necessary to gradually increase the gravity of the mud, after pumping is started, which finally should attain as high a gravity as is possible to handle through a mud pump.

By introducing the mud directly into the pores of the water sand under pressure, it drives the water back and the mud fluid follows up the water, filling and sealing up the pores.

After all the mud is pumped into the sand that it is possible to introduce with the working pressure of a mud pump, you will notice a pressure on the sand of about 450 to 600 lbs.. which, when first shut in will gradually decrease, the latter is due to the pressure of the mud fluid gradually forming its way into the sand while un-

God grants liberty only to those who love it, and are always ready to guard and defend it. Webster.

der pressure, barring minor leaks in the tubing, fittings, etc. It has proved very practical to hold as high a pressure on the water sand, after it is packed, by simply starting up the pump at intervals as the pressure decreases. In time the sand will become packed to such a point, that the decrease of pressure will be very slight.

Now, having the water sand mudded off under pressure (for instance, 600 lbs.). the well is now ready to have the plugs inserted to hold in the mud pressure.

On account of the mud in the water sand being at 600 lbs. pressure, it is necessary to apply some greater pressure on top of the packer before trying to pull the tubing and packer, so as to overcome the 600 lbs. mud pressure to keep the mud from coming up the hole. The inside of the casing, on top of the packer, should be filled up with water in order to acquire a static water pressure which is greater than the mud pressure under the packer.

For instance, supposing that the inside of the casing, or the top of the outside of the packer, was filled clear to the top of the hole with water, this would make a column of water 2,450 feet, equal to about 1,100 lbs. static pressure, on top of the packer. This, you see, would easily overcome the mud pressure which is on the water sand under the packer. Now then the tubing and packer can be pulled out without any danger of the mud pressure being released to come up the hole.

In preparing this mud fluid it is necessary to screen the mud so there are no stones, trash, hemp, etc., in the mud filler to clog the perforation.

After the tubing and packer is pulled out, the inside of the casing is to be kept filled with water in order to be able to drive plugs without releasing the mud pressure.

Limit plugs, which are made of wood with lead tops, are then driven on the bottom, and sufficient plugs are put in so that the top of the plugs when driven, will be 10 feet off the bottom, the same place where the packer was set. After the plugs are properly driven, the well is then ready to be tested by bailing out the water, and cleaning out to the bottom. Let it remain idle for a day or two in order to ascertain if the water is shut off and to see if plugs are tight. This can be accomplished by a good bailing test.

Where the sands are very hard, it is useless to try to pump mud into the water sand, however, in such a case, cementing would be in order. as it has been proven that cementing can be successfully done in a hard, tight sand, as previously mentioned.

The advantage in plugging off loose water sands with the mud fluid process, is that the mud is driven back into the water sand, or pores, and displaces the water with mud, while if the cementing process was used, it would merely form a plug at the bottom. the size of the hole drilled, and there would be nothing to prevent the water from coming up and around the sides of the cement plug where the sands are loose.

In most of the oil sands there is generally a hard formation, or shell, between the oil pay and the water sand, which serves as a bond dividing the sands. However, it has been known that some oil sands run into a water sand without any breaks or shell between them.

As to how far the mud fluid will penetrate a water sand, depends entirely on the tightness of the sand. The writer has had the experience of demonstrating that the mud fluid in one particular well in Butler County, Kansas. has penetrated as far as 2,100 feet.

To explain this item I want to say that there was a well drilling about 2,100 feet away from a completed oil well, in which the bottom water was being mudded off, and after pumping mud for several days into the water sand, we discovered that the drilling well 2,100 feet away was drilling into the oil sand. They drilled through the same and drilled into mud, and the mud was raising up in the hole, due to being under pressure.

In most all cases where the water is securely plugged off and the hole is free from water, I find that the oil production has increased to a great extent.

MINIATURE TEST ABSORBER.

T. H. Kerr, Engineer, The Ohio Fuel Supply Company, Columbus, O.

The accompanying cut illustrates a miniature test absorber for testing natural gas for gasoline content. This absorber was designed to secure a minimum of size combined with extreme accuracy and it has proven to be better than we had hoped. It has a capacity of

MINIATURE TEST ABSORBER.

1,000 cc of mineral seal oil and will pass 100 cu. ft. of gas per hour without carrying oil over. It is constructed of aluminum and seamless tubing, is 20½" long and 31" in diameter. weighing 9½ pounds.

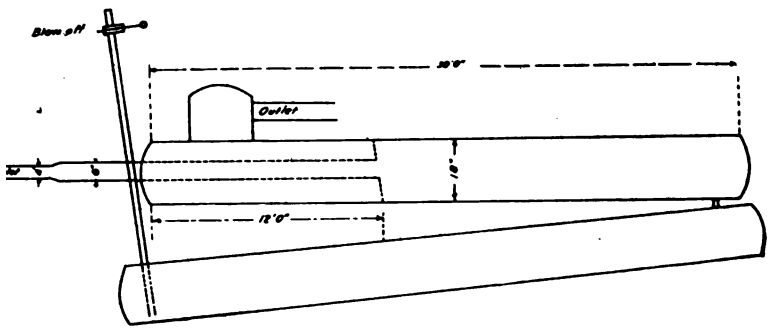
Valuable assistance was given me in this design by H. T. Boyd and P. McDonald Bidison, both of this company.

Let ignorance talk as it will, learning has its value. De La Fontaine.

DRIP FOR HANDLING WATER ON WET WELLS.

Designed by E. F. McDaniels, District Superintendent, Wichita Natural Gas Company.

This drip has been found to be very practical for wells which are making a large amount of water. The drip is made entirely by the weld process, which enables us to use pipe which would otherwise be worthless.

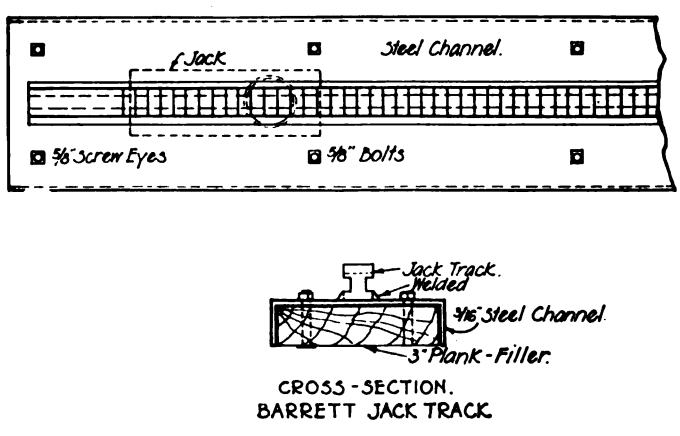


DRIP FOR HANDLING WATER ON WELLS.

TO OVERCOME TROUBLE WITH BARRETT PIPE JACK TRACK.

J. P. Strickler, The Columbus Gas & Fuel Company, Columbus, O.

Construction men who have been having trouble with barrett pipe jacks will find the following little wrinkle useful. We have found the same to be a big improvement on our work.



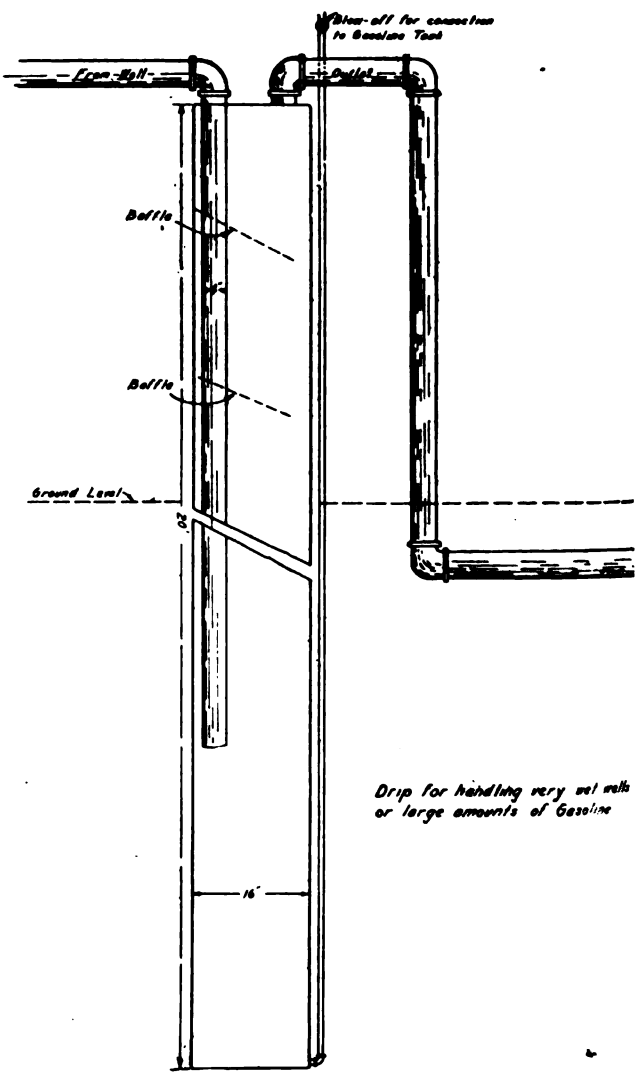
REMEDYING TROUBLE WITH BARRETT PIPE JACK TRACK.

An excellent way to overcome trouble with your barrett pipe jack track is to have same welded to a 10" channel iron. This will prevent track from springing out of shape and breaking in two. Put a couple of screw eye bolts in end of your jack board or iron, so you can lift your jack out of trench, as you will find it pretty heavy. The extra weight is a good thing, as it assists in holding our jack bolt to bottom of trench. It will assist you greatly in driving various size pipes to just turn the same with a pair of tongs, while you are driving with your jack.

DRIP FOR HANDLING VERY WET WELLS OR LARGE AMOUNT OF GASOLINE.

Designed by Ross M. Stuntz, Superintendent Gas Lines, Wichita Natural Gas Company, Bartlesville, Okla.

Where a well makes a large amount of gasoline, we have found that this is the most practical drip for this purpose. The 16" pipe giving plenty of room for expansion and under the ordinary conditions sufficient reservoir space for any well. The blow-off can be attached to the gasoline tank and the drip can be blown as often as necessary and all the gasoline saved.



GASOLINE DRIP.

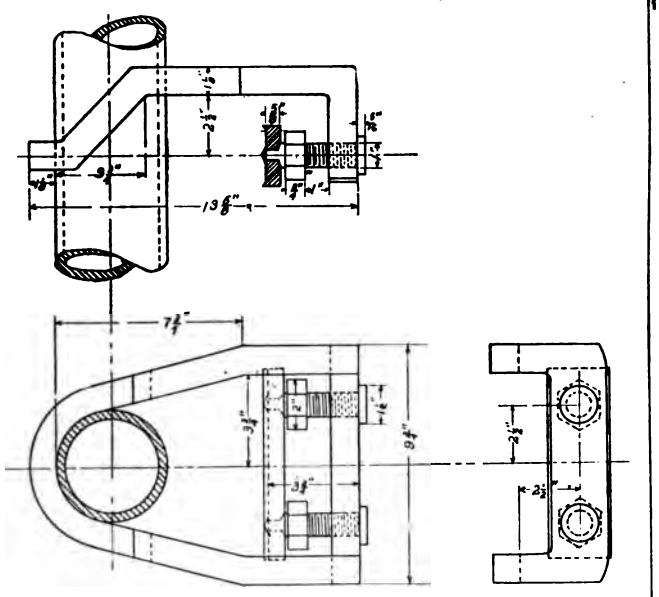
When a man assumes a public trust, he should consider himself as public property. Jefferson.

GIN POLE CLAMP FOR CARRYING PIPE.

G. E. Wagner, The Ohio Fuel Supply Co., Columbus, O.

Much time is generally lost in loading or unloading large sized pipe from railroad cars, owing to the loosening of the staple or clevice used to hold the gin pole to the car. The accompanying working drawing is for a clamp that will hold the pole firm and is more quickly adjusted than the staple and wedges commonly used.

The clamp should be put around the pole before it is raised, after which it can be placed over the side of



GIN POLE CLAMP

the car with the set bolts inside. A wrench of the proper size should be provided to turn the nuts which are welded to the bolts. If made to the dimensions shown there will be no danger of getting the clamp fast between the pipe and the side of the car as the standard used to hold the part of the load above the sides, will hold the pipe out enough to give plenty of clearance. The dimensions given provide for the use of a 4-inch ID pipe as a gin pole. If a larger pole is desired proper allowance can easily be made.

TRESTLES AND BOARD FOR WORKING ON MAPS.

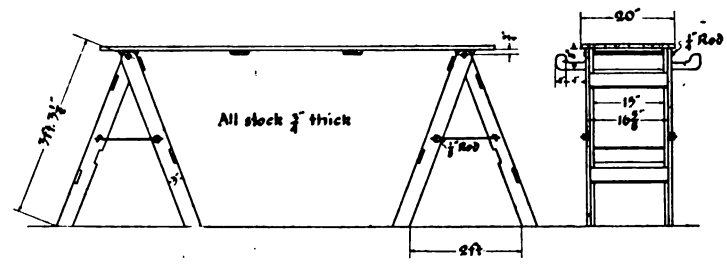
Hugo J. Eyerdam, The East Ohio Gas Company, Cleveland, O.

It frequently becomes necessary to copy all wall maps which have to be consulted by others while the work is going on.

This is usually done on a drafting table which is not built for that purpose, making it necessary to roll the upper and lower ends of the map. It also happens that some one is obliged to consult the map during copying, and it never fails to be at a place other than where the draftsman is working, necessitating rolling and unrolling of the map, making the new map which lays under it dirty.

This condition is overcome by allowing the map to hang on the wall and move the trestles and board close to it.

The board may be made from ¾" matched lumber planed and sand-papered with rounded edges and of a length to take the largest map and well cleated on the under side. the end cleats to be of such length that they will fit in between the legs of the trestles and rest upon the ¼" rod, allowing the board to project slightly beyond the legs of the trestles. The board may also be covered with beaver boarding in one piece.



Trestles and board for working on large wall maps
by H.J. Eyerdam.

The trestles are made collapsible and the legs fold into one another. They are made of ¾" stock 3" wide. The braces on the legs are mortised and a notch is cut in the leg which folds inside to receive the brace of the outer leg. The upper brace on the outside leg is not mortised and projects 6" beyond the leg and is hollowed out forming a socket to receive the slack ends of the map on each side of the board and is 3" below the bottom of the board. A ¾" rod acts as a hinge and is placed at a point so that the cleat resting upon it will just give clearance to the board or ¾" from top of legs. A ⅛" rod for hook and two eyelets keeps the legs from spreading greater than two feet. If the legs are made 39½" from floor to ¼" rod for hinge the proper height for working will be attained.

As the draftsman is working at the wall he will no doubt cast his own shadow upon his work, so it is essential to provide a movable light with shade.

USING SHINY SIDE OF TRACING CLOTH.

E. O. Hickstein, Empire Gas & Fuel Company, Bartlesville, Okla.

In drawing with ink on tracing cloth, the writer always uses the shiny side of the cloth. This is principally because it can be kept cleaner, and it erases a good deal easier.

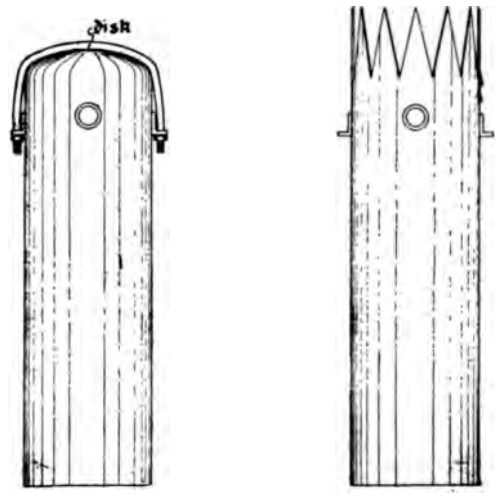
He does not use pounce nor powdered chalk. All that he finds necessary is to rub the shiny side of the cloth briskly with a handkerchief or any sort of material for a half-minute or so. The ink will "take" very readily after this treatment.

The man that makes a character makes foes.—Young.

METHOD OF REINFORCING WELDED FITTINGS.

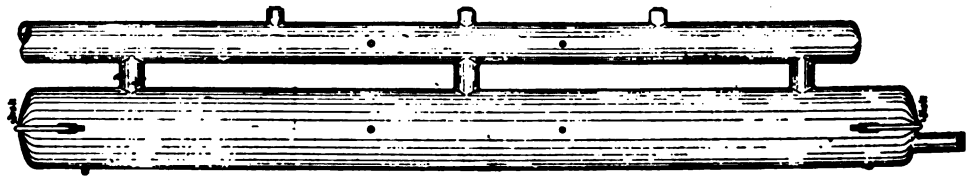
Fred Dooling, The East Ohio Gas Company, Cleveland, O.

The accompanying drawings show a good method of welding shut the ends of pipe, so as to withstand



END WELDED TO WITHSTAND HIGH PRESSURE.

high pressure. The drawing of the welded header also illustrates how a strong header can be made up quickly and sufficiently strong to withstand high pressure.

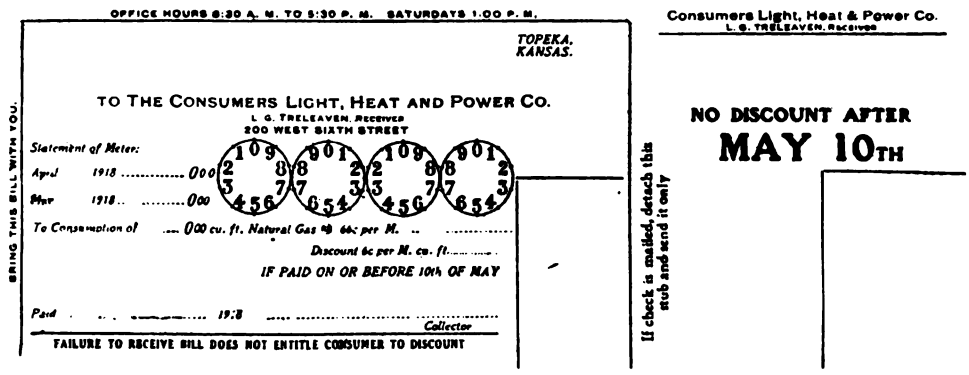


Welded header

LET FOLKS READ THEIR OWN METERS.

L. G. Treleaven, Consumers Light, Heat & Power Company, Topeka, Kan.

The purpose of this dial is to do away with the great waste of time occasioned by verifying meter readings after bills have been delivered, and I also



SIMPLE METHOD OF READING METERS.

believe that it will do more to get consumers into the habit of reading their meters, something which all gas companies strive to accomplish, than anything which I have seen promoted.

This is not intended to interfere with the verifications sent for by the bookkeepers. We still continue to prevent, so far as possible, incorrect meter readings being billed. But we get hundreds of requests every month for verifications which seem like a positive waste of time. In these cases we ask the consumer to mark the position of the hands of the meter dial on the bill and, if his marking shows that an error was made. we will make whatever correction is necessary. The consumer is thus compelled to look at his meter and while marking the position of the hands does not teach him how to read it, it is a long step in that direction. It also pleases him to learn that we will accept the marking made by him as well as increasing his confidence in the integrity of the company.

It is needless to say that should a consumer mark a reading which looked suspicious we would hold up making the correction until we had a chance to get another reading ourselves, but we have had no such cases up to this time.

We have had this plan in use for several months and it has proven to be very satisfactory, having done away with verifications on consumers' complaints almost entirely. Occasionally a consumer will demur at being asked to mark the reading but when it is explained to him that it is right in line with the spirit of conservation, the elimination of unnecessary labor, he usually is won over.

We find the plan to be particularly effective in handling complaints made by telephone. It does away entirely with the necessity of looking up the consumer's account and then trying to convince him that the bill is probably correct. He is simply told that if there is any doubt in his mind of the correctness of the bill to mark the position of the hands on the dial printed on the bill and when he brings the bill in for payment we will correct it if wrong.

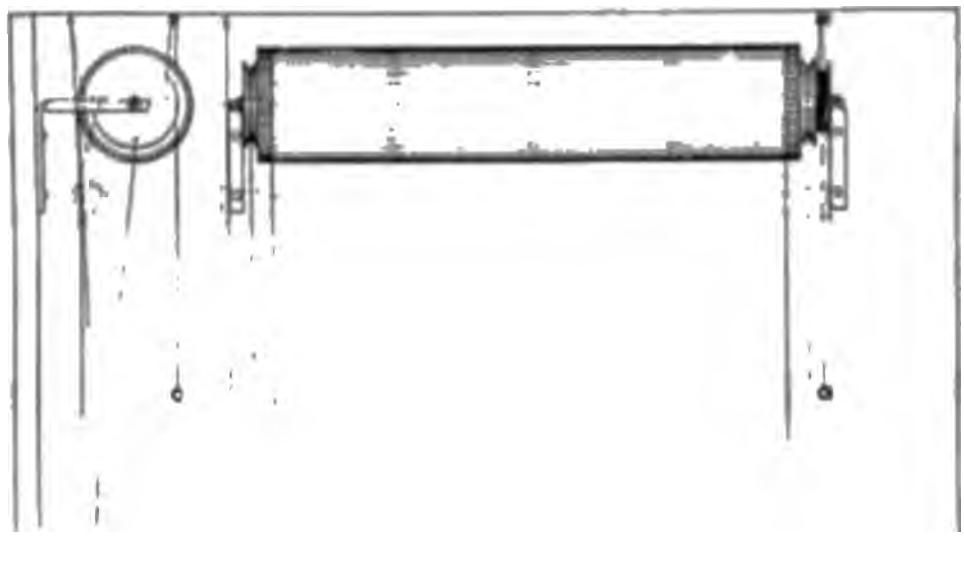
It is as difficult to appropriate the thoughts of others as it is to invent.—Emerson.

A SQUIRREL CAGE MAP ROLLER.

F. C. Ramsey, Engineer, The Ohio Fuel Supply Company, Columbus, O.

A map five and one-half feet wide and seventeen feet long was found to be an unwieldy affair until the following squirrel cage roller was devised

A light roller, pulleys on each end, was made by building up around a tin curtain roller a shell that would not be too heavy for the spring and one large enough in diam



eter to give a good map [illegible] raised from the end [illegible] used for supports A [illegible] pulling the map down at the [illegible] up The spring was wound [illegible] when it was at [illegible]

The loose end of the map was taken [illegible] diameter about the size of the curtain [illegible] the end of the map with [illegible] Small tapes of cloth were fastened [illegible] given several turns at [illegible] passed back up to the larger [illegible] side of the upper roller

Adjustments were made with the map just clearing the floor and when the map went up it reversed itself at the point of attachment on the smaller roller and the small roller raised with the end of the map

When the map is pulled down the small roller drops until almost to the floor when it reverses and rolls the map up as it is unwound from the larger roller

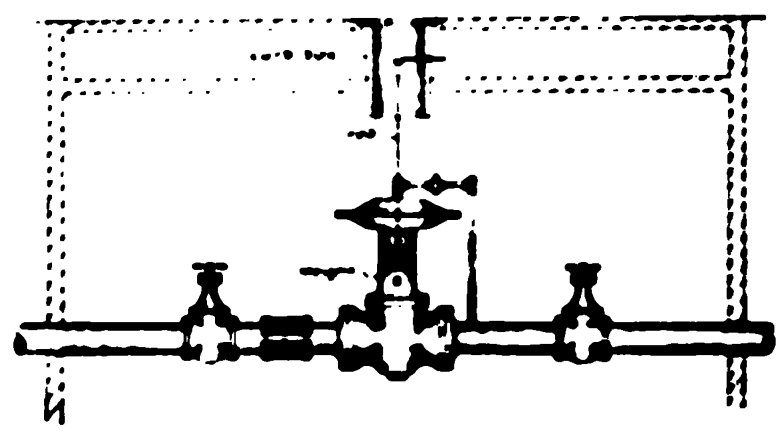
The maps are attached to the rollers with muslin at each end

REGULATION OF PRESSURE

M. Meller, The Fort Wayne Gas Company, Youngstown, O.

A very convenient method of raising and lowering the pressure by means of a Chaplin-Fulton regulator located in an underground vault It is often necessary for the night man to decrease the pressure in the evening and to increase it again early in the morning By

[illegible] that can't over [illegible] the proper size



Method for changing weights on regulators

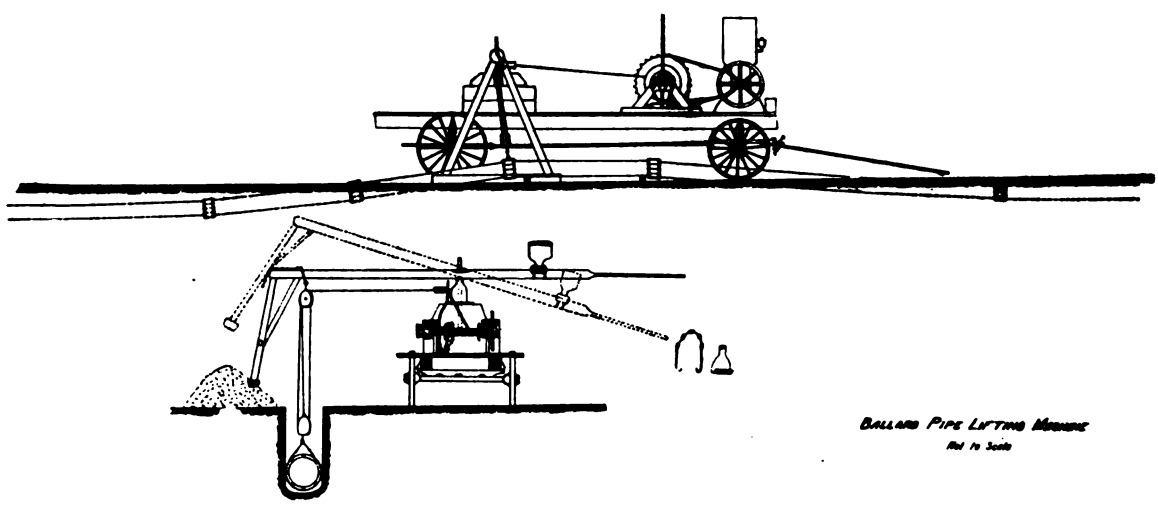
weight to a chain the weight can be removed at night and put back in place in the morning, without the [illegible]

Syllables govern the world Selden

BALLARD PIPE LIFTING MACHINE.

This machine was constructed and designed by the Gas Pipe Line Department, Wichita Natural Gas Company.

The horse was made of 4" and 6" pipe. After pipe is uncovered seven men and one team to draw the wagon can lift one mile of 18" pipe a day. In lifting 8", 10" and 12" pipe one can skip every other coupling and lift with good results. We used a winch with clutch on drum, also a brake so as to hold load at any given place. This was pulled by a 6 h. p. Novo Engine. We have lifted 9,000-pound gates out of ditch with this machine with ease, using a double and triple block.



BALLARD PIPE LIFTING MACHINE.

DISAPPEARING WALL DESK.

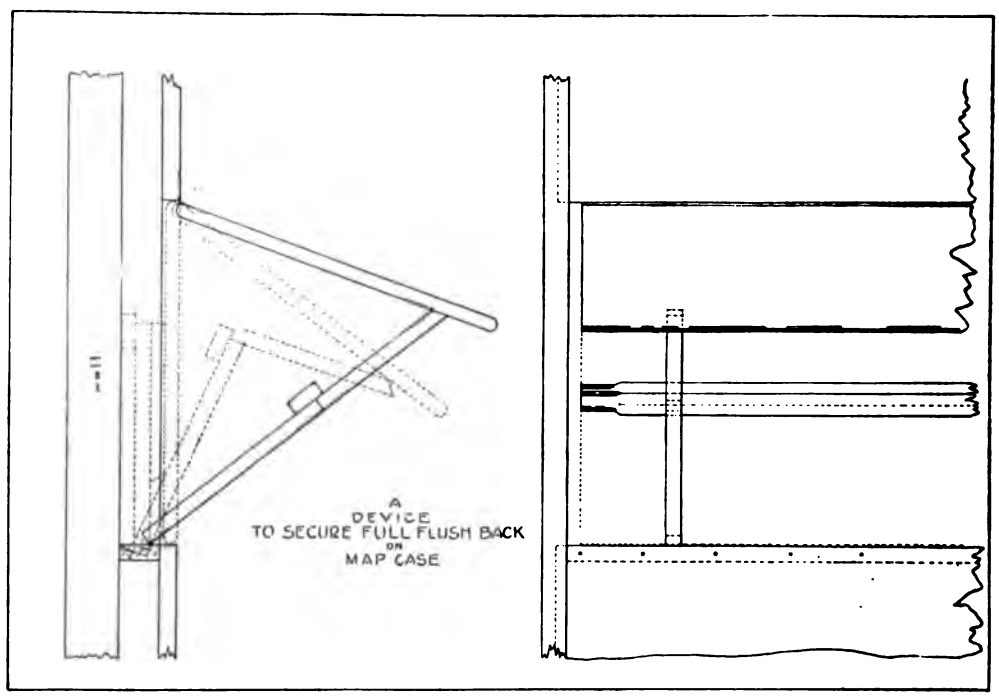
E. C. Ramsey, Engineer, The Ohio Fuel Supply Company, Columbus, O.

A device such as shown by the accompanying sketch has proven most satisfactory in providing a work table when incorporated as part of the equipment of a map case where maps of large dimensions mounted on rollers are used, on which much work has to be done.

The unwieldy nature of a large map makes it prohibitive to remove the map from its fastenings whenever any great amount of revision is to be done and this is overcome by adapting the disappearing shelf as shown.

When required for use it is simply pulled up to position when the knee joints drop automatically into place and form a rigid support sufficient to bear the weight of the person working on it. The number of supports is dependent, of course, on the length of the table. The height of the shelf is regulated to either a standing position or for use with a stool. The shelf is lowered by breaking the joint of the support when the shelf drops to vertical position of its own weight.

This same device is readily applicable for a standing desk or wall table where space is at a premium.



Censure is the tax a man pays to the public for being eminent.—Swift.

NEW BRUNSWICK—Moncton

A gas well showing good production was completed recently by the Brunswick Gas & Oilfields, Ltd., in this field.

ONTARIO—Canboro Township

A good gas well has been drilled in by the Chippewa Oil & Gas Company in this township.

Elgin County

A 1,000,000-foot gasser has been completed by the Richmond Gas & Oil Company of Chatham in its No. 5 test.

Moulton Township

Drilling operations have been begun in Moulton Township by the American Gas & Gasoline Company, a new concern in the field.

We wish to obtain copies of the July 1916 issue of THE NATURAL GAS JOURNAL, and will pay 20 cents for each copy sent us.

THE NATURAL GAS AND GASOLINE JOURNAL BUFFALO, N. Y.

FINANCIAL REPORT.

BY JO. P. CAPPEAU SONS.

Stocks	Sales	Open	High	Low	Last
Columbia G. & E.....	...	....	....	....	32¾
Favette Gas	...	....	....	....	110
Mfg. L. & H.	824	52¼	52¼	51	51
Ohio Fuel Supply	1387	43	43	42	42
Ohio Fuel Oil	111	16	16	15½	16
Oklahoma Gas	1119	25	25	24	24
Pgh. Oil & Gas.....	2932	6⅝	7½	6¼	7¼
Pure Oil Com.	...	....	....	....	24¼
Cent. Kentucky Gas..	...	....	....	....	19
Lone Star Gas	161	100	100	100	100
Union Gas	...	....	....	....	153½
*Tropical Oil	100	5	4½	4½	4½

*Sales not given, only daily quotations.

AMONG RECENT CHANGES.

The many friends of Charles E. Mueller, for so long a period known as of the Hayes Manufacturing Company of Erie, Pa., will be surprised to learn of his transfer of interests to the new company lately formed in Erie and known as the American Hollow Boring Co., (Hollow bored forgings a specialty).

Mr. Mueller becomes Secretary and Treasurer, and will handle the sales of the concern. Good wishes go with him from many gas-field friends.

W. B. Alexander & Company and the Georgia Oil Company have a 5,000,000-foot gasser which is not yet completed on their lease in Section 9-14-13 at a depth of 1,898 feet. South of the Youngstown pool the Barbara Oil Company has completed a 15,000,000-foot gas well in No. 1 on the Stewart farm in Section 30-13-13.

In the Eram district, Section 7-13-15, J. H. Rebold's test on the Williams farm is an 8,000,000-foot gasser.

Tulsa County

Charles Page has a 3,000,000-foot gasser in the Red Fork district, on the Island farm in Section 8-19-11, at a depth of 1,760 feet.

Rogers County

In the Catoosa District, the Tulsa Fuel Company has a 500,000-foot gasser in No. 2 on the Lumford farm in the northwest quarter of Section 23-21-14.

PENNSYLVANIA—Clarksville

It is reported that natural gas service will be brought to this city by the United Natural Gas Company.

Greene County

On Harts Run, Springhill Township, the Manufacturers' Light & Heat Company has drilled its test on the D. S. Gregg farm, a gasser in the Big Injun sand to the Gordon formation.

On Fish Creek, Liberty District, the Carnegie Natural Gas Company has completed a test on the Fox heirs' farm and got a gasser with a capacity of 2,500,000 cubic feet a day.

Waynesburg

The Waynesburg Tin Mill Plant of the American Steel Company recently brought in a 2,000,000-foot gasser on its property in this city.

TEXAS—Fort Worth

Among the work accomplished by the Lone Star Gas Company during the past year, was the large item of rearranging its transmission lines. Two gas fields in Oklahoma were entered, and the company also acquired a large output of acreage in new West Texas oil fields. Aggressive development work for oil has been brought under way.

Ranger

The T. & P. Coal Company test on the Veil farm, nine miles north of Ranger showed 30,000,000 cubic feet at a depth of 3,960 feet. The well is also spraying oil.

UTAH—Crowley

The Midland Carbon Company has completed its gasoline recovery plant here. The gasoline is recovered from the gas which the company is using to make carbon and lampblack.

Lovell

A gasoline recovery plant is to be built here by the Larabee Carbon Plant. The company will also make carbon and lampblack.

Salt Lake City

The erection of a casinghead gasoline plant is being promoted here by John M. Thomas of Dern & Thomas, brokers, of this city.

Healdton

A large casinghead gasoline plant is being constructed in the Healdton field by the Superior Petroleum & Gasoline Company.

Kay County

The Empire Gas & Fuel Company completed No. 2 on the Hobaugh farm, in the southwest quarter of Section 30-29-1 east, and has a 12,000,000-foot gasser from sand at 1,868 to 1,885 feet. The Empire Gas & Fuel Company's No. 1 on the Pratt farm, in the southwest quarter of Section 31-29-1 east is a 13,000,000-foot gas well from sand the top of which is at 2,588 feet.

Norman

Owing to the shortage of farm hands in certain sections of Oklahoma, business men are leaving their business for three or four hours each day and are going into the country assisting the farmers in harvesting their crops. At Norman, Manager Frank Carder of the Oklahoma Gas & Electric Company, Norman division, has been taking a number of employes out for such work each day after 5 o'clock and the men are donating the 40c per hour earned to the Red Cross.

Osage

An 18,000,000-cubic foot well has been completed by Carl K. Dresser in the Wild Horse District, Section 13-22-10.

Osage

An 11,000,000-cubic foot well has been brought in in this field by the Indian Territory Illuminating Oil Company. This production adds to the supply of the Doherty interests in the southwest.

Tulsa County

No. 1 well of Dolby and others on the Ackley land in Section 36-16-13, is reported to have a capacity of 3,000,000 cubic feet at a depth of from 1,700 to 1,716 feet.

Youngstown

The Mid-Continent Development Company has a 4,000,000-foot gasser in No. 4 Berryhill, in the southeast quarter of Section 18-14-13, at 1,770 feet.

PENNSYLVANIA—Allegheny County

In the Speechley sand development in Plum Township, the Philadelphia Company's No. 3 on the R. G. Sharp farm is showing very light. Clark & Vincents test on the A. McMath farm is a gasser.

Greene County

In Springhill Township, the Manufacturers Light and Heat Company has drilled a test on the Jacob Earnest farm into the Maxon sand, developing a fair gas pressure. In Aleppo Township a test of the Natural Gas Company of West Virginia on the William Fluharty farm is a gasser in the fourth sand.

Pittsburgh

The Philadelphia Company in its financial report for the year ending March 31st, 1918, shows income from its coal department of $1,695,348. The coal properties operated by the company were purchased from the Allegheny Coal Company. They cover 3,000 acres of coal lands in Allegheny County, and have a daily output of about 1,500 tons of coal. The purchase included five and one-half miles of railroad connecting with the Pennsylvania Railroad and the Pittsburgh, Bessemer and Lake Erie Railroad.

The Philadelphia Company has advanced its rate from 27½ cents to 35 cents net for domestic purposes.

Sheffield

It is reported that the Citizens Gas Company has been taken over by the Interior Oil & Gas Company.

TEXAS—San Angelo

The Texas-Oklahoma Oil & Gas Company has leased 1,700 acres on the Lipan flat, south of the city, and will shortly put down a deep test.

Coleman County

Wood & Wooley have drilled in their No. 1 well on the Overall land near the town of Valeria, and it is showing a production of 13,000,000 cubic feet per day.

UTAH—Salt Lake

The affairs of the Jordan River Oil & Gas Company will be administered by Dern & Thomas and Guy La Coste of the Bureau of Mines, under an arrangement recently entered into by these parties. The same combination has taken over the Union Oil & Gas Company and the Pioneer Oil & Gas Company.

WEST VIRGINIA—Doddridge County

In the Big Flint District, the Philadelphia Company has a Gordon sand gasser at its second test on the J. D. McReynolds farm.

Harrison County

In Simpson District, the Hope Natural Gas Company's deep test on the M. O. Goff farm is still shut down at a depth of 7,385 feet. In the same district the same company's test on the James Durkin farm is a gasser in the Big Injun sand. In Eagle District the same company completed a fifth sand gasser on the G. B. Coffman farm.

Wetzel County

In Greene District, one mile east of the Pine Grove Field, the Hope Natural Gas Company has a Gordon sand gasser at No. 2 on the Hughes Lowe farm.

In Church District, the Manufacturers Light & Heat Company has a gasser at a test on the J. D. Teagarden farm.

The Carnegie Natural Gas Company's test on the A. J. Lemley farm is a gasser in the Big Injun sand.

WYOMING—Casper

The Curtis Petroleum Company and the New York Oil Company have completed a second well on the Iron Creek dome, which promises good production. The new well is in the southwest quarter of Section 11, Township 32 north, Range 82.

ONTARIO—Bridgeburg

The Provincial Natural Gas Company has issued a final warning to consumers to look for other means of heating this winter, as the prospects at present indicate that the gas supply will be short.

Quebec

A proposal was brought forward in the Dominion Parliament recently by Colonel Currie, M. P., for the fixing of the price of gasoline and also the imposition of a gasoline tax. Hon. Mr. McLean, acting minister of finance, stated that the government was investigating the price of gasoline, but that the administration of a gasoline tax would be very difficult.

THE BLOCK GAS MANTLE COMPANY

YOUNGSTOWN, OHIO

Manufacturers of

INCANDESCENT MANTLES

FOR

Natural and Artificial Gas Lamps, Gasoline Lamps, Kerosene Lamps, Liquid Gas Lamps

AND

MANTLES OF EVERY KIND AND DESCRIPTION

BLOCK No. 17
Indoor Arc

Manufacturers of

GAS ARC LAMPS

MANUFACTURERS OF

THORIUM NITRATE

The Principal Raw Material used in the manufacture of Incandescent Mantles.

DO NOT FAIL TO WRITE US IF QUALITY, PRICE AND PROMPT DELIVERY ARE OF INTEREST

BLOCK No. 26
Five Mantle Outdoor Arc

OUR POLICY OF THE PAST AND FOR THE FUTURE:

"We give our trade the benefit of conditions"

A well which is estimated to have a capacity of 14,000,000 cubic feret a day has been completed on the H. B. Brown farm, in the Shreve field.

OKLAHOMA—Chickasha

A large gasser has been completed about eighteen miles southwest of this city near the town of Cement by the Gorten Oil Company. The sand was struck at 2,250 feet and the tools were blown from the hole when the drill had gone two feet into the sand. This opens a new gas field in Oklahoma.

Healdton

The Superior Petroleum & Gasoline Company is installing a large casinghead gasoline plant in this field, and plans to construct a second one upon completion of the first.

The Merrick Gasoline Company of Chicago is also building a plant in this field.

Muskogee

The Oklahoma Natural Gas Company, which supplies Muskogee and numerous other towns with their gas supply has contracted with owners of gas wells near Eram, and will start laying an eight-inch line from the Cole Pool station to the newly contracted supply. There are six gas wells already in, at and near Eram, the combined production of these ranging around 30,000,000 feet.

The Greenwood Company has a good gasser in its test on the Ivy Taylor farm in Section 27-15-16.

Oklahoma City

The properties of the Oklahoma Natural Gas Company have been valued at $5,900,000 by the State Board of Equalization. Last year the valuation of the plant was placed at $4,918,000.

Okmulgee

W. B. Pine, Kimbley and Reading have completed a 15,000,000-foot gas well at a depth of 2,054 to 2,067 feet in Section 21-15-11.

On the Harjo farm in Section 17-13-12, the Okmulgee Producing and Refining Company found large gas production at 2,265 feet.

The Big Ben Oil & Gas Company has about 12,000,000 feet in its well on the Lewis farm in Section 2-15-11. The drill is down to a depth of 2,310 feet.

Poteau

The American Indian Oil & Gas Company has a gasser in Section 28-7-26, three miles east of town, which is estimated to have a production of 30,000,000 cubic feet.

PENNSYLVANIA—Cameron County

Turner Bros. of Bolivar are preparing to drill test wells on a 13,000 acre tract in this county, upon which they have secured leases.

Greene County

In Center Township, the City & Suburban Gas Company's test on the Jacob Powers farm is a gasser with a capacity of 1,000,000 cubic feet a day.

Greensburg

A petition has been filed by the Greensburg Natural Gas, Oil & Water Company with the State Public Service Commission seeking permission to withdraw gas service to the Greensburg Water Company on the

ground that the ever diminishing supply is insufficient to serve both the public and this industrial concern.

Harmarsville

Back of Harmarville, Harmar Township, the Summit Oil & Gas Company has drilled a second test on the Boreman farm through the fifth sand. It is a gasser.

Pittsburgh

The regular quarterly dividend of 2½ per cent. has been paid by the Ohio Fuel Supply Company, as well as an extra dividend of 2 per cent.. payable in Liberty Bonds.

Ridgeway

The Pennsylvania Gas Company has drilled in a large well at Bear Creek at a depth of 2,600 feet. It is said that the production of the well is estimated at 15,000,000 cubic feet.

TEXAS—Brownwood

H. L. Doherty & Company have undertaken development work in this field. The initial well drilled in is an oil well with a production of 240 barrels a day.

Dallas

The Lone Star Gas Company has announced to its patrons in this city, Fort Worth and in other towns served, that there is every indication that the gas supply this winter will be sufficient to meet every need.

Thurber

Gas was struck in the Fulfer well, twelve miles south of town at a depth of about 3 300 feet.

ONTARIO—Bridgeport

The Provincial Natural Gas Company has drilled its well on the lake shore to a depth of 3,200 feet, without finding gas. This well is being drilled for experimental purposes, the success of which will have much to do with the gas supply available next winter.

Haldimand County

It is reported that for the year ending July 1st, 1918, the Dominion Natural Gas Company drilled in this district 26 wells. of which 15 were producers, and 11 dry holes. The total production was 2,176,000 cubic feet. The company is now drilling three wells.

McCreedy farm, Section 4, and is drilling No. 2 on the M. F. Mowrey farm, Section 4.

Sandusky

The Logan Gas Fuel Company, it is reported, has announced that it does not wish a renewal of its contract, expiring in 1919, to furnish natural gas in this city. The matter of artificial gas supply is now under consideration by the city commissioners.

PENNSYLVANIA—Beaver County

In the Whipple field, the Springer Oil Company completed its initial well on the Snyder heirs farm and it is a fair gasser in the hundred-foot.

Elk County

The Pennsylvania Company has completed a new well in the field near Bear Creek which it estimated to have a production of 12,000,000 cubic feet per day. The gas was struck at a depth of 2,600 feet.

TEXAS—Austin

A pumping plant is being built by the Prairie Oil & Gas Company on the Brazos River at a point near Breckenridge. A water pipe line 40 miles in length is being constructed by the company to the ranger fields.

Coleman

Root & Ramsey have brought in a 16,000,000 cubic foot gas well thirteen miles southeast of this city, on the Schirmacher lease.

Dallas

The Lone Star Gas Company is removing its headquarters from Fort Worth to this city. A floor of the new American Exchange Bank building has been leased, and here the company will occupy very attractive quarters.

Eastland

The establishing of a gas plant in this city is assured. Sufficient capital for the formation of a company has been subscribed. A system adequate to serve 25,000 people will be installed. This construction work will be in the hands of the Texas Pipe Line Company of Waco.

Ranger

The Sammies Oil Corporation of Oklahoma City has drilled in its test in this field, and at a depth of 3,800 feet is making about 9,000,000 cubic feet of gas, and about 100 barrels of oil.

WASHINGTON—Hanford

The Conservative Oil & Gas Company of Spokane has leased a large tract of land from the Walla Walla Gas & Oil Company and will begin operations at once.

Sanford

The Conservative Oil & Gas Company of Spokane has leased a large tract of land and will begin development work shortly.

WEST VIRGINIA—Gilmer County

On Cove Creek, Troy district, the Hope Natural Gas Company's test on the A. L. Rymer farm is a gasser in the Big Injun sand. In Glenville district, the Philadelphia Company has a gasser in the Gantz sand at a test on the F. M. Fitzpatrick farm.

Harrison County

On Sycamore Creek, Union district, the Reserve Gas Company drilled a test on the G. T. Post farm through

the stray sand, getting a fair gasser in that formation.. On the same stream, the same company's test on the M. W. Smith farm is a gasser in the fifth sand.

Jackson County

In Washington district the United Fuel Gas Company has completed its initial test well on the J. E. Westfall farm, and has a showing of gas and oil.

Lewis County

In Hacker's Creek district the Home Natural Gas Company's test on the Samuel Alkire farm is a fair gasser, and in the same district the same company has completed a test on the Lawson Rhodes farm and it is a light gasser.

In Mannington district the Carnegie Gas Company completed a gasser on the D. F. Wells farm.

Marion County

On Dents Run, Mannington district, the Eastern Petroleum Company drilled No. 4 on the Alfred Kendall farm, formerly a light producer in the 30-foot sand, to the Campbell Run sand, developing a gasser in that formation. The well has a capacity of 900,000 cubic feet a day.

Tyler County

The Manufacturers Light & Heat Company has completed its test well on the G. W. Adams farm in Ellsworth district and has a good gas well.

The Manufacturers Light & Heat Company has completed its initial test on the Andrew Haught farm, in McElroy district, and has a small gas well.

ONTARIO—Bridgeburg

The Provincial Natural Gas Company has completed the drilling of its big test well. After getting down to a depth of 3,340 feet the wall has turned out a failure.

NATURAL GAS, PIPE LINE, OIL AND GAS WELL SUPPLIES

U BOLT CLAMP

CAST IRON RIVER CLAMP
TO COVER REGULAR COUPLINGS

River Clamps
Sleeves
U Bolt Clamps
Beckwith Checks
Extra Heavy Gas Cocks
Etc.
AND
A FULL LINE OF BRASS AND IRON GAS MIXERS

High Pressure Fittings of the Best Material and Highest Grade Workmanship

HEAVY, tested at 800 pounds for 250 pounds working pressure.
EXTRA HEAVY, tested at 1500 pounds for 500 pounds working pressure.
HYDRAULIC, tested at 2500 pounds for 900 pounds working pressure.

"DAYTON"

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Clamps, Sleeves, Tees,
Elbows and Crosses

All Steel, Tight Joints, Perfect Expansion, Economical, Durable

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Branches at all points of importance in the oil and gas fields of this country, Canada and Mexico.

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Tech Pa.

NATURAL GAS AND GASOLINE JOURNAL

VOL. 12 FEBRUARY 1918 No. 2

PUBLISHED BY THE PERIODICALS PUBLISHING COMPANY
Central Office and Publishing Plant, Buffalo, New York

You Needn't Worry About Condensation

It is all drained off by an Automatic Overflow in the—

Westinghouse Positive Gas Meter

Westinghouse

Improved Positive and Proportional Gas Meters

This feature makes them unrivalled for measuring casing-head gas, artificial gas, or any gas impregnated with gasoline or other condensate, whether under vacuum or pressure.

Being all-metal construction there are no leather diaphragms to stretch and break under high pressure, or to become worthless after a few days subjection to condensate under vacuum or normal pressure, making the meter inaccurate or stopping it altogether.

The bearings are self-lubricating, reducing wear to a minimum, insuring long life and low maintenance. The accuracy of these meters is the same at either maximum or minimum capacity.

Pittsburgh Meter Company

General Office and Works: EAST PITTSBURGH, PA.

NEW YORK	CHICAGO	KANSAS CITY	COLUMBIA, S. C.	LOS ANGELES	SEATTLE
149 Broadway	5 So. Wabash Ave.	6 W. 10th St.	1433 Main St.	631 So. Spring St.	802 Madison Street

Also manufacturers of "Ironclad" Dry Gas Meters, Meter Provers,— and "Keystone" "Artic", "Eureka", "Keystone Compound" and "Utility" Water Meters.

NATURAL GAS AND GASOLINE JOURNAL

VOL. 12 MARCH 1918 NO. 3

PUBLISHED BY THE PERIODICALS PUBLISHING COMPANY
Central Office and Publishing Plant, Buffalo, New York

Westinghouse Positive Gas Meter
Unrivaled for measuring casing-head gas, artificial gas, or any gas impregnated, with gasoline or other condensate.

Westinghouse

Improved Positive and Proportional Gas Meters

Four Distinctive Features:

Disposal of Condensation: An automatic Overflow drains off all gasoline or other condensate.

Mechanical Construction: All metal construction. No leather diaphragms to stretch and break under high pressure, or to become worthless after a few days subjection to condensate under vacuum or normal pressure.

Bearings: Self-lubricating bearings reduce wear to a minimum, and insure long life and low maintenance.

Accuracy: Uniform at all capacities from minimum to maximum.

Pittsburgh Meter Company

General Office and Works: EAST PITTSBURGH, PA.

NEW YORK	CHICAGO	KANSAS CITY	COLUMBIA, S. C.	LOS ANGELES	SEATTLE
149 Broadway	5 So. Wabash Ave.	6 W. 10th St.	1433 Main St.	631 So. Spring St.	802 Madison Street

Also manufacturers of "Ironclad" Dry Gas Meters, Meter Provers,— and "Keystone" "Artic", "Keystone-Compound" "Eureka", and "Utility" Water Meters.

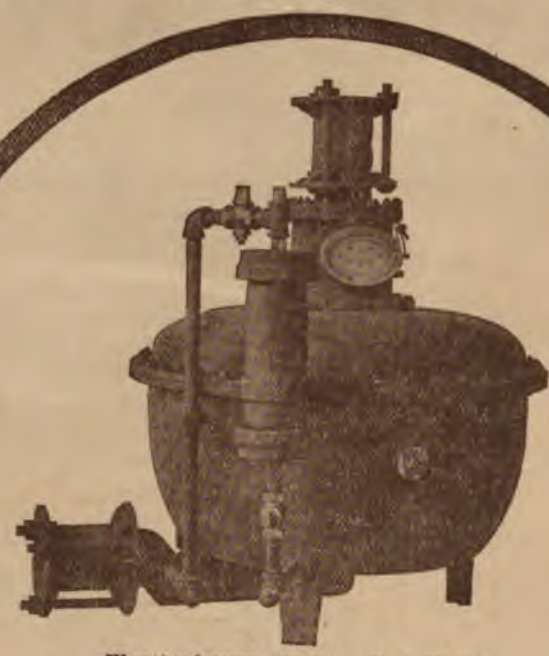
NATURAL GAS AND GASOLINE JOURNAL

VOL. 12 APRIL 1918 No. 4

PUBLISHED BY THE PERIODICALS PUBLISHING COMPANY
Central Office and Publishing Plant, Buffalo, New York

Do You Sell or Buy Casing-Head Gas ?

If so, you are vitally interested in having it accurately measured.
—Dry gas meters can not do it and remain accurate.



Westinghouse Positive Gas Meter
Unrivaled for measuring casing-head gas, artificial gas, or any gas impregnated, with gasoline or other condensate.

The only meters that maintain their accuracy when measuring gas impregnated with gasoline, or other condensate, are —

Westinghouse

Improved Positive and Proportional Gas Meters

Because they are constructed entirely of metal. ---There are no leather diaphragms to stretch and break under high pressures or to become worthless after a few days subjection to the action of gasoline, or other condensate, and accumulation of gasoline or other liquid is automatically taken care of.

Pittsburgh Meter Company, East Pittsburgh, Pa.

NEW YORK	CHICAGO	KANSAS CITY	COLUMBIA, S. C.	LOS ANGELES	SEATTLE
149 Broadway	5 So. Wabash Ave.	6 W. 10th St.	1433 Main St.	931-2 Union Oil Bldg.	802 Madison Street

Also manufacturers of "Ironclad" Dry Gas Meters, Meter Provers and Keystone, Arctic, Eureka, Keystone-Compound and Utility Water Meters.

NATURAL GAS AND GASOLINE JOURNAL

VOL. 12 MAY 1918 No. 5

PUBLISHED BY THE PERIODICALS PUBLISHING COMPANY
Central Office and Publishing Plant, Buffalo, New York

It Stood The Test

The past winter taxed the service of the natural gas companies to the limit. —When the pressure dropped below 4 oz. the ordinary gas meter usually not only refused to register, but interfered with the flow of gas to the consumer.

IRONCLAD

THE 100% METER

Stood the test regardless of temperature and low pressure.

Gas companies, partially equipped with "Ironclads" found that their consumers served through-high absorption meters, had practically no gas when the pressure dropped to 1 oz. while those served through "Ironclads" had an ample supply.

Throughout the severe winter "Ironclads" gave eminently satisfactory service everywhere and we have yet to hear of even one complaint regardless of the gas company's pressure.

Next winter may find you with lower pressure. ---Prepare, now, for the worst.

Pittsburgh Meter Company

General Office and Works: EAST PITTSBURGH, PA.

NEW YORK	CHICAGO	KANSAS CITY	COLUMBIA, S. C.	LOS ANGELES	SEATTLE
149 Broadway	5 So. Wabash Ave.	6 W. 10th St.	1433 Main St.	930-1 Union Gas Bldg.	802 Madison Street

Also manufacturers of "Ironclad" Dry Gas Meters, Meter Provers,— and "Keystone" "Arctic", "Keystone-Compound" "Eureka", and "Utility" Water Meters.

NATURAL GAS AND GASOLINE JOURNAL

VOL. 12 JUNE 1918 No. 6

PUBLISHED BY THE PERIODICALS PUBLISHING COMPANY
Central Office and Publishing Plant, Buffalo, New York

Gas Meters with Leather Diaphragms Cannot Maintain their Accuracy when Measuring —

Casing-Head Gas

Under the action of gas containing gasoline, the diaphragms rapidly parch, stiffen and crack, destroying the accuracy of the meter, or stopping its operation altogether.

Westinghouse Positive Gas Meter

Westinghouse

Improved Positive and Proportional Gas Meters

have no leather parts. They are constructed of metal throughout, and are the only meters impervious to the action of gasoline or other condensate. —They continue to measure accurately under either pressure or vacuum.

All accumulation of gasoline, or other liquid, is automatically drained off.

Pittsburgh Meter Company, East Pittsburgh, Pa.

NEW YORK	CHICAGO	KANSAS CITY	COLUMBIA, S. C.	LOS ANGELES	SEATTLE
149 Broadway	5 So. Wabash Ave.	6 W. 10th St.	1433 Main St.	930-1 Union Gas Bldg.	802 Madison Street

Also manufacturers of "Ironclad" Dry Gas Meters, Meter Provers, and Keystone, Arctic, Eureka, Keystone-Compound and Utility Water Meters.

NATURAL GAS AND GASOLINE JOURNAL

VOL. 12 JULY 1918 No. 7

PUBLISHED BY THE PERIODICALS PUBLISHING COMPANY
Central Office and Publishing Plant, Buffalo, New York

TRUE

there's a meter for every purpose, but the Only Meters for Measuring Casinghead Gas are the

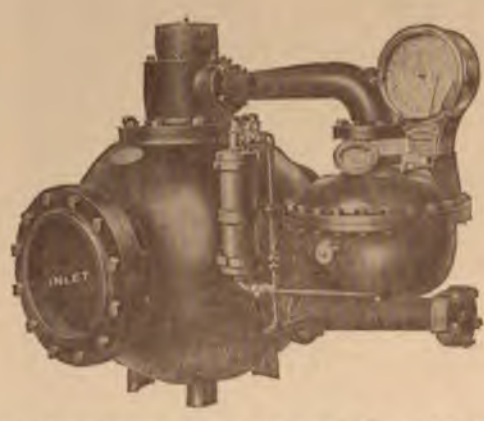
Westinghouse Improved
Positive and Proportional Gas Meters

All Metal Construction.

No Leather Diaphragms.

Automatic Seal Overflow for Gasoline and other Condensate.

Westinghouse Positive Gas Meter



Westinghouse Proportional Gas Meter

The problem of measuring casinghead gas satisfactorily solved.

Pittsburgh Meter Company, East Pittsburgh, Pa.

NEW YORK	CHICAGO	KANSAS CITY	COLUMBIA, S. C.	LOS ANGELES	SEATTLE
149 Broadway	5 So. Wabash Ave.	6 W. 10th St.	1433 Main St.	931-2 Union Oil Bldg.	802 Madison Street

Also manufacturers of "Ironclad" Dry Gas Meters, Meter Provers, and Keystone, Arctic, Eureka, Keystone-Compound and Utility Water Meters.

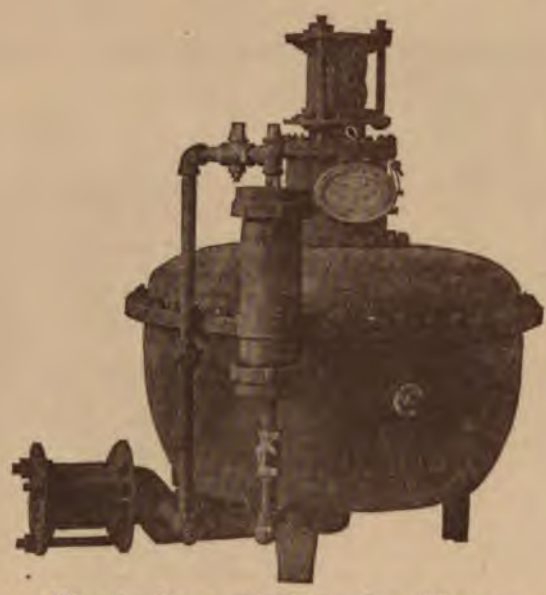
NATURAL GAS AND GASOLINE JOURNAL

VOL. 12 AUGUST 1918 NO. 8

PUBLISHED BY THE PERIODICALS PUBLISHING COMPANY
Central Office and Publishing Plant, Buffalo, New York

Now! More Than Ever

Westinghouse
Improved Positive and Proportional
Gas Meters

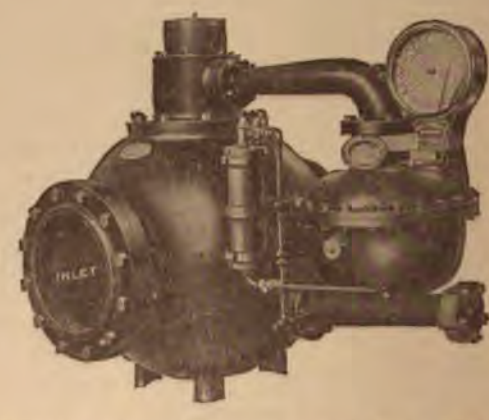


Westinghouse Positive Gas Meter

are being appreciated as the only reliable and accurate meters for the measurement of casinghead gas.

The all-metal construction does away with leather diaphragms, which dry up and crack when subjected to the action of gasoline. The automatic overflow drains off all accumulations of gasoline, or other condensate. ---The self-lubricating bearings insure long life.

Besides these three distinctive features, there are others our nearest office will tell you about.



Westinghouse Proportional Gas Meter

Pittsburgh Meter Company

General Office and Works: EAST PITTSBURGH, PA.

NEW YORK	CHICAGO	KANSAS CITY	COLUMBIA, S. C.	LOS ANGELES	SEATTLE
149 Broadway	5 So. Wabash Ave.	6 W. 10th St.	1433 Main St.	931-2 Union Oil Bldg.	802 Madison Street

Also manufacturers of Proportional Gas Meters, Meter Provers,— and "Keystone" "Arctic", "Eureka", "Keystone-Compound" and "Utility" Water Meters.

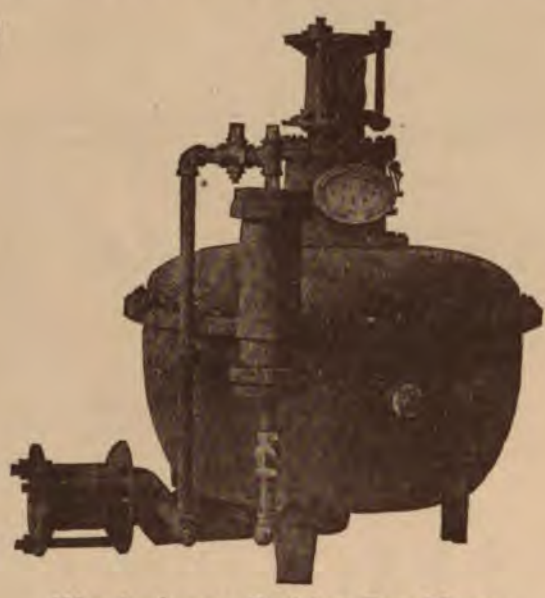
NATURAL GAS AND GASOLINE JOURNAL

VOL. 12 SEPTEMBER 1918 No. 9

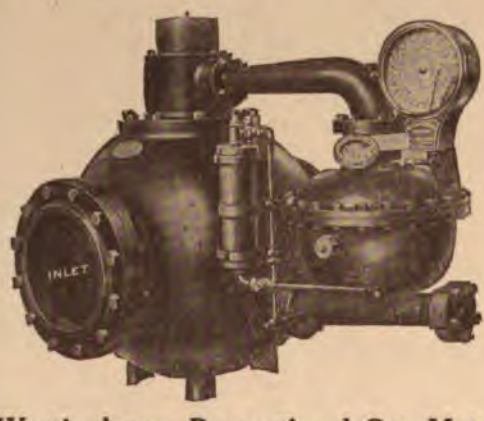
PUBLISHED BY THE PERIODICALS PUBLISHING COMPANY
Central Office and Publishing Plant, Buffalo, New York

"Over Here"

when it's a question of measuring Casinghead Gas, the only reliable, accurate and satisfactory meters are—



Westinghouse Positive Gas Meter



Westinghouse Proportional Gas Meter

Westinghouse

Positive and Proportional

Gas Meters

Being all-metal construction, they have no leather diaphragms to become brittle and crack under the action of gasoline, making the meter useless. —An Automatic Seal Overflow carries off all gasoline and other condensate.

Our nearest office will give full particulars promptly.

Pittsburgh Meter Company, East Pittsburgh, Pa.

NEW YORK	CHICAGO	KANSAS CITY	COLUMBIA, S. C.	LOS ANGELES	SEATTLE
149 Broadway	5 So. Wabash Ave.	6 W. 10th St.	1433 Main St.	931-2 Union Oil Bldg.	802 Madison Street

Also manufacturers of "Ironclad" Dry Gas Meters, Meter Provers, and Keystone, Arctic, Eureka, Keystone-Compound and Utility Water Meters.

NATURAL GAS AND GASOLINE JOURNAL

VOL. 12 OCTOBER 1918 No. 10

PUBLISHED BY THE PERIODICALS PUBLISHING COMPANY
Central Office and Publishing Plant, Buffalo, New York

The Strong Feature

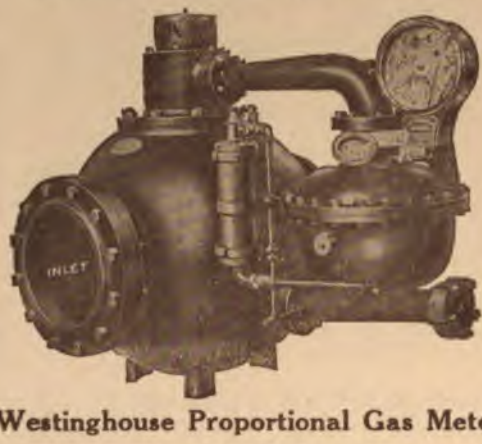
of Westinghouse Positive and Proportional Gas Meters, particularly in the measurement of casing-head gas, is the weak feature of other meters.

Westinghouse

Improved Positive and Proportional

Gas Meters

Westinghouse Positive Gas Meter



Westinghouse Proportional Gas Meter

Have No Leather Diaphragms

The action of gasoline or other condensate makes the leather diaphragms of other meters dry up, crack and break, which destroys the usefulness of the meters.

The all-metal construction of Westinghouse Positive and Proportional Gas Meters makes them practically indestructible.

Condensate of any kind is carried away by an automatic seal overflow.

Pittsburgh Meter Company, East Pittsburgh, Pa.

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Also manufacturers of "Ironclad" Dry Gas Meters, Meter Provers, and Keystone, Arctic, Eureka, Keystone-Compound and Utility Water Meters.

NATURAL GAS AND GASOLINE JOURNAL

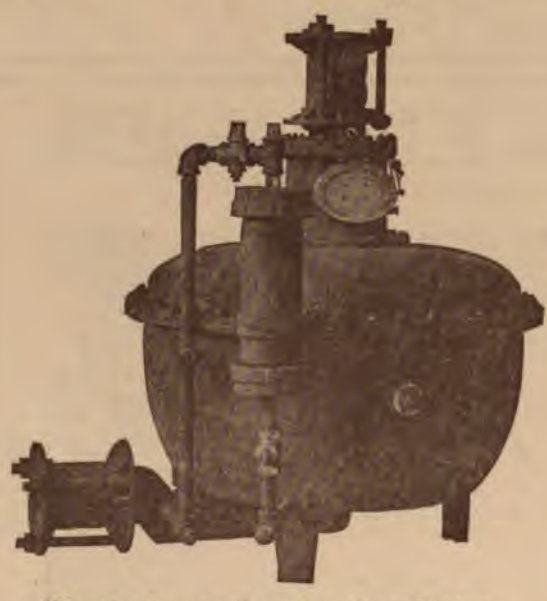
VOL. 12 NOVEMBER 1918 No. 11

PUBLISHED BY THE PERIODICALS PUBLISHING COMPANY
Central Office and Publishing Plant, Buffalo, New York

To Measure
Casinghead Gas Successfully

requires a meter, the mechanical parts of which are in no way affected by the action of gasoline or other condensate.

Westinghouse
Improved Positive and Proportional Gas Meters



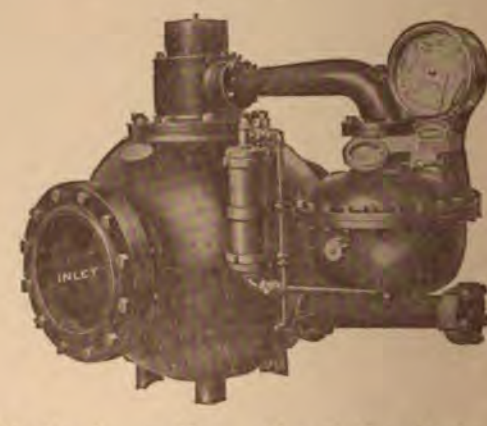
Westinghouse Positive Gas Meter

An automatic seal overflow, in Westinghouse Positive and Proportional Gas Meter, carries off all accumulation of gasoline, and other condensate.

We have a pamphlet describing these meters fully; ask for it.

fulfill this requirement in every respect. They have no leather diaphragms. Their construction is metal throughout.

The action of gasoline quickly destroys leather diaphragms, rendering any meter, of which they are a part, useless as a measuring instrument.



Westinghouse Proportional Gas Meter

Pittsburgh Meter Company

General Office and Works: EAST PITTSBURGH, PA.

NEW YORK	CHICAGO	KANSAS CITY	COLUMBIA, S. C.	LOS ANGELES	SEATTLE
149 Broadway	5 So. Wabash Ave.	6 W. 10th St.	1433 Main St.	Union Oil Bldg.	802 Madison Street

Also manufacturers of Meter Provers,— and "Keystone" "Arctic", "Eureka", "Keystone-Compound" and "Utility" Water Meters.

NATURAL GAS AND GASOLINE JOURNAL

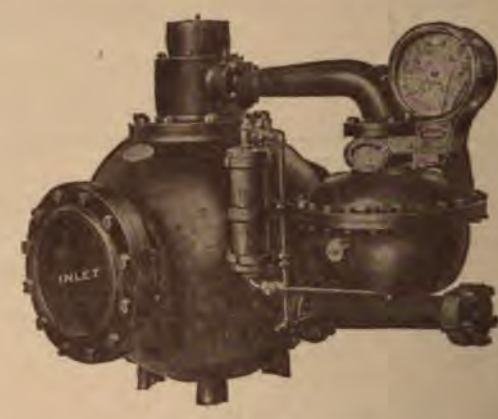
VOL. 12 DECEMBER 1918 No. 12

PUBLISHED BY THE PERIODICALS PUBLISHING COMPANY
Central Office and Publishing Plant, Buffalo, New York

The Gasoline in Casinghead Gas

drys up and cracks the leather diaphragms in dry gas meters, making them useless as measuring instruments.

Westinghouse Positive Gas Meter



Westinghouse Proportional Gas Meter

Westinghouse Improved

Positive and Proportional Fluid Gas Meters Have No Leather Diaphragms

They are all-metal construction, therefore are unaffected by the action of gasoline or other condensate. —The measuring element is a metal drum. —An automatic seal overflow carries off all condensate.

These features make Westinghouse Improved Positive and Proportional Fluid Gas Meters the logical meters for measuring casinghead gas, or any gas in large volumes, at either high or low pressures.

Pittsburgh Meter Company

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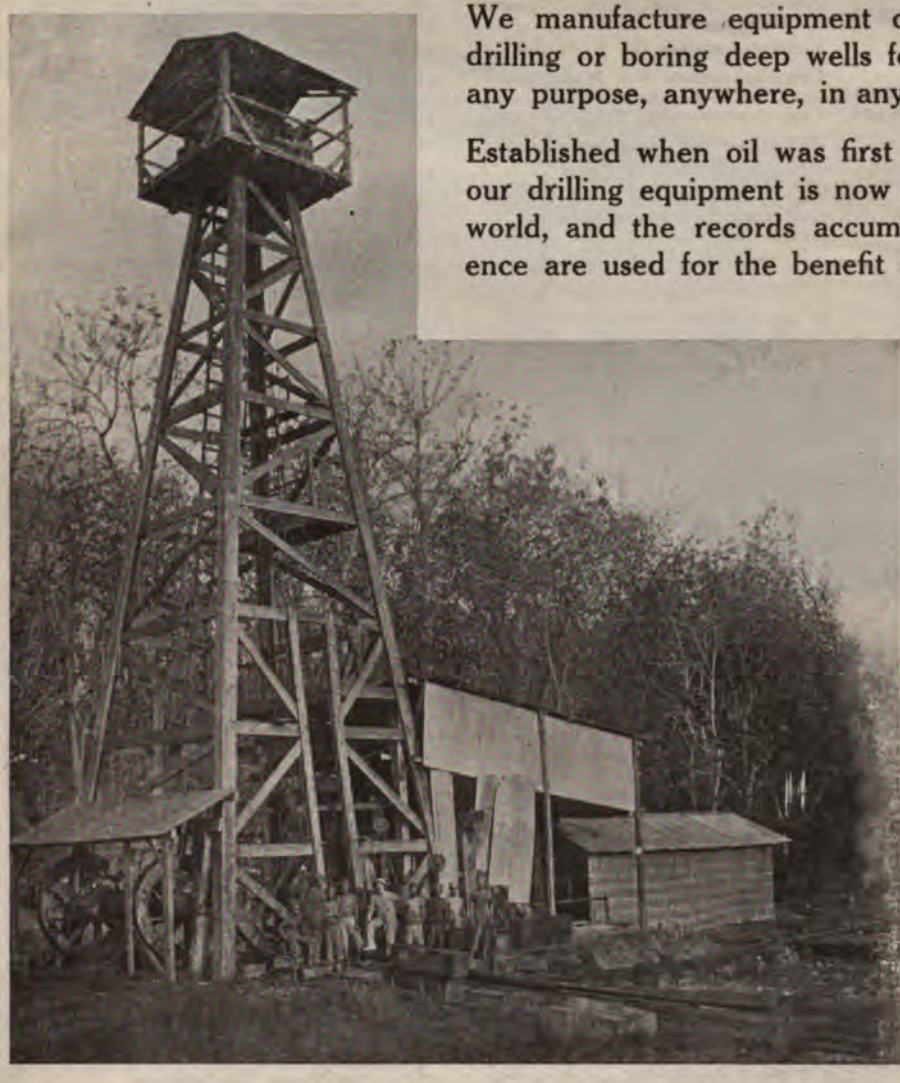
EVERYTHING FOR OIL AND GAS WELLS

"OILWELL" EST'D. 1862. TRADE MARK. (REGISTERED)

BRANCH STORES IN ALL OIL FIELDS

"Oilwell" Equipment in the Dutch East Indies



We manufacture equipment of every description for drilling or boring deep wells for oil, gas, water, or for any purpose, anywhere, in any formation, to any depth.

Established when oil was first discovered in America, our drilling equipment is now found in all parts of the world, and the records accumulated from this experience are used for the benefit of our customers.

We can furnish everything or anything used in drilling by the

American Cable System

Rotary System

Canadian System

Combination System

Hydraulic Circulating System

Stove Pipe and Mud Scow System

Portable Drilling Machines

Inquire at any of our 75 Branch Stores

"Oilwell" products world renowned—Both above and under ground

OIL WELL SUPPLY CO.

PITTSBURGH

NEW YORK SAN FRANCISCO LOS ANGELES TAMPICO LONDON

Natural Gas and Gasoline
JOURNAL

SUBSCRIPTION—
$2.00 IN THE U. S.

CONTENTS FOR DECEMBER, 1918

VOLUME 12
THIS NUMBER 12

PUBLISHER'S NOTICE

PUBLISHED MONTHLY.

Advertising Copy should be in by the 15th of month previous to issue.

ADVERTISING RATES on request.

CORRESPONDENCE IS SOLICITED from all those interested in Natural Gas and kindred industries.

Buffalo Long Distance (Day) Bell Telephone, Seneca 5562.

Cable Address:—"Publight, Buffalo."

Address General Correspondence, Editorial and Advertising Matter to Central Office.

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PERIODICALS PUBLISHING CO.,
68 West Huron Street,
BUFFALO, N. Y.

LUCIUS S. BIGELOW, *President and Editor.*
HARRIS S. BIGELOW, *Secretary.*

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF AUGUST 24, 1915

of Natural Gas and Gasoline Journal published monthly at Buffalo, State of New York, for October, 1918.

Editor, Lucius S. Bigelow, 68 W. Huron St., Buffalo, N. Y.

Managing Editor, x x x

Business Managers, x x x

Publisher, Periodicals Publishing Co.

Owners: (If a corporation, give its name and the names and addresses of stockholders holding 1 per cent. or more of total amount of stock. If not a corporation, give names and addresses of individual owners.)

Periodicals Publishing Company, Buffalo, N. Y.

Lucius S. Bigelow, 68 W. Huron St., Buffalo, N. Y.

Known Bondholders, mortgagees, and other security holders, holding 1 per cent. or more of total amount of bonds, mortgages, or other securities: (If there are none, so state.) —None—

Average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above. (This information is required from daily newspapers only.) Is a monthly.

LUCIUS S. BIGELOW,
Signature of editor, publisher, business manager or owner.

Sworn to and subscribed before me this 10th day of October, 1918.

E. L. REED,
Notary Public in and for Erie County.

Form 3526 c5-6012.
(My commission expires March 30th, 1920.)

CONTENTS OF THIS ISSUE

INDEX OF PAST 1918 ISSUES

Jarvies GAS BURNER H&P CO INCORPORATED

THE SPREADING FLAME

ACCOMPLISHES PERFECT AIR AND GAS MIXING

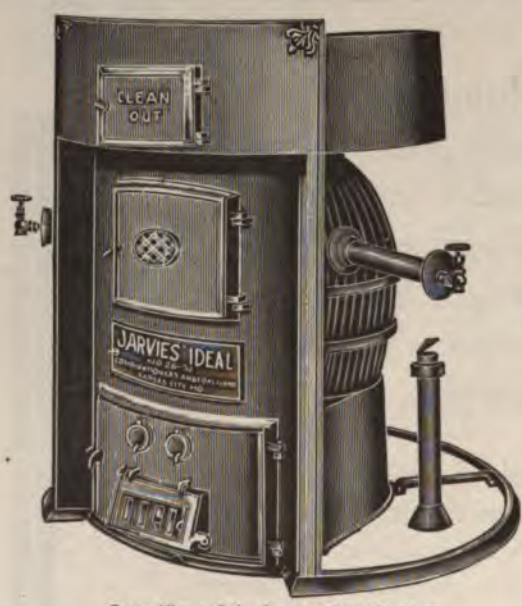
Proper Application of Heat
Perfect Combustion and Right Regulation

ALL JARVIES BURNERS are similar to this illustration but in sizes to suit needs.

THE DISC SCREWS FORWARD OR BACKWARD ON THE SPUD, INCREASING OR REDUCING AIR ADMISSION

THIS BURNER may be applied to coal furnaces already in use, ***without removing the coal grate.*** The burners are installed through the coal door opening — ***need not be removed when firing with coal.***

Showing how JARVIES GAS BURNERS operate in the JARVIES COMBINATION GAS AND COAL STOVES and JARVIES COMBINATION GAS and COAL FURNACES.



Open View of the Jarvies Combination READYBUILT Gas and Coal Furnace

WHY ?

do users of stoves and furnaces fail to recognize that combination coal and gas appliances afford secureness from famine, either of gas or of coal.

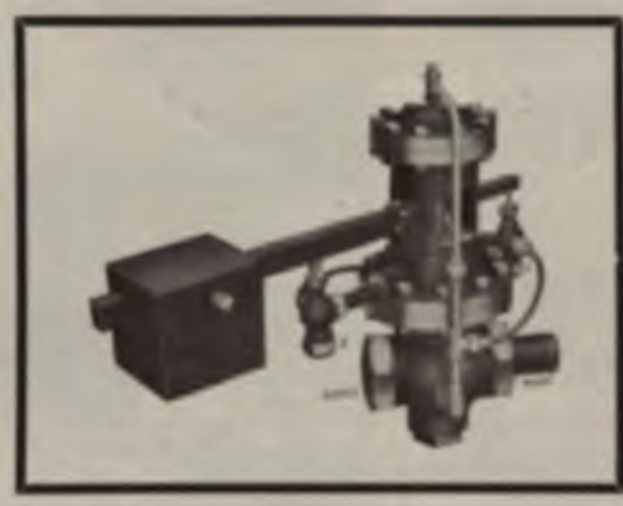
To use an old coal furnace or stove with a ring gas burner *when gas is plentiful* means to remove the burner with much annoyance *when there is a gas shortage.*

The *Jarvies* combination gas and coal furnaces and stoves are the *always ready kind*, the gas burner is not removed when coal is used. The *Jarvies* Furnaces and Stoves may be used exclusively with gas or with gas as an auxiliary to coal, or with gas to ignite the coal from the top, thus the coal burns down which prevents clinkers and smoke.

Jarvies Gas Burner, Heating & Plumbing Co.

4022 Belleview Ave., KANSAS CITY, MO.

The Fulton Gas Relief Valve for Natural Gas Gasoline Plants



Filling a Real Need in Gasoline Extraction Plants—

IN the manufacture of gasoline from natural gas, during the process of treatment, the gas is raised to a high pressure by means of a multi-stage compressor. After the gasoline has been extracted from the quantity under treatment, it becomes necessary to remove the residuum gas still under high pressure by discharging it.

For this purpose, the Fulton Gas Relief Valve has been designed, and is so constructed that when the compression has reached the stage, or limit, of pressure at which all the gasoline will be removed from the gas under treatment, the Relief Valve will open and permit the treated gas to escape, while a fresh supply of untreated gas flows in to take its place.

This Relief Valve has been carefully tested on the gasoline plants of a number of prominent manufacturers and found to meet a great want perfectly.

Also Manufacturers of

The Vigilant Oil Level Regulator

The Fulton Gas Fuel Boiler Governor

Gas Regulators and Governors

Heavy Brass and Bronze Castings

Catalog on Request

THE CHAPLIN-FULTON MFG. CO.

28-34 Penn Avenue **Pittsburgh, Penna.**

The Big Light For Big Business

MANUFACTURERS the country over are waking up to gas lighting. Face to face with the absolute need for abundant, eye-comforting and dependable light, they are finding out what you've known for years—that only gas gives such a light.

Make the most of this awakening. Meet the needs of manufacturers with the light of big business—the

Welsbach Factory "Reflex-20"

The coming winter will be one of overtime work done by artificial light with accuracy at a premium.

You can offer the Factory "Reflex-20," certain of your customers' complete satisfaction. Are you ready to take advantage of this assured demand?

Remember that the store-keeper is just as eager for this light as the manufacturer, and put in your orders today for Standard "Reflex-20."

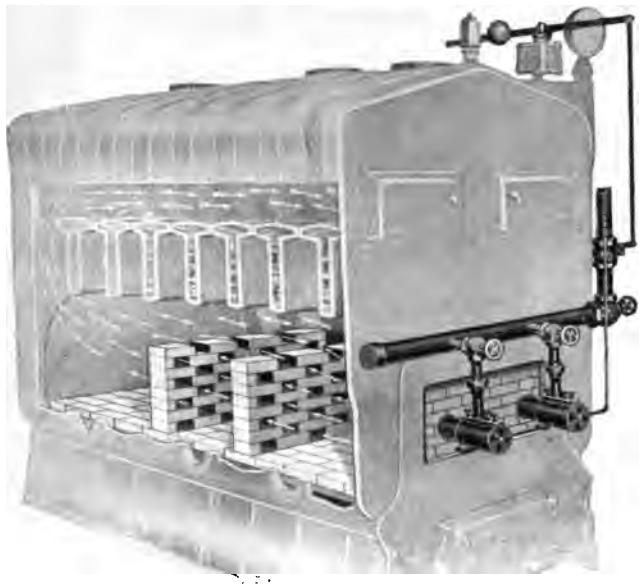
If you act *now* you can obtain these goods. Tomorrow—materials will be scarcer—lamps may be harder to get.

The "E-E" Lighter
(The Pilot that can't blow out)
is now a part of the "REFLEX 20"
This exclusive Welsbach feature means that all pilot outage due to draughts is a thing of the past wherever the REFLEX 20" is installed

WELSBACH COMPANY
GLOUCESTER, N. J.

GWYNN GAS BURNERS

Arranged for Easy and Quick Removal from *any type of heating or power boiler,* in case of necessity.



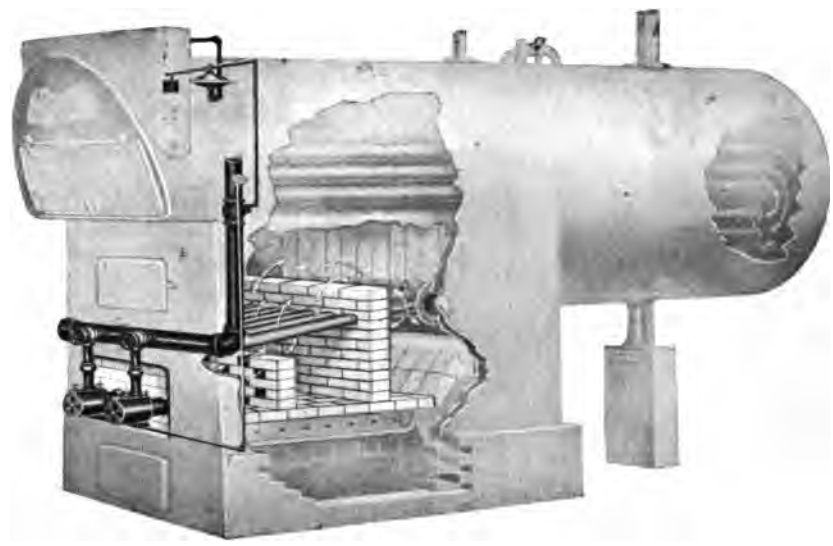
THOUSANDS of GWYNN GAS BURNERS have been sold the last ten years for use in Cast Iron boilers. The method of application varies, according to demands of plant but the typical method here illustrated is the one most commonly used.

Other types of installation are fully described and illustrated in our Catalog No. 40-N.

CATALOG NO. 20 Describes Gas Burners for all kinds of Small Heating Work.
CATALOG NO. 35 Describes Combination Gas and Oil Burners for Intense Heating Work

THE general run of DOWN DRAFT type boilers require application such as illustrated although draft and working range should determine the best method of applying gas burning equipment.

We explain this fully in Catalog No. 40-N.



THE GWYNN ENGINEERING CO.

Gas and Oil Burning Equipment

100-108 Liberty Ave., Pittsburgh, Pa.

WORTHINGTON

Keeping ahead of the country

"NOTHING succeeds like success"—this is in brief the story behind each of the plants grouped under the Worthington name.

For each has, through many years, held its own high place in the esteem of American industry; indeed each was called into being by some vital need of industry, and you will find our products in the service of countless important branches of the country's production.

And because our products are such necessary partners in so many and so varied interests, our growth has fairly paralleled the nation's industrial development. From modest beginnings to eight great plants, each both pioneer and leader in its field, each under a common name preserving past traditions of service and satisfaction—this is the concrete measure of Worthington success, and a hint as well of the even larger part to be played in the future.

Worthington Pump and Machinery Corporation
115 Broadway, New York City
Branch Offices in 24 Large Cities

Works

Worthington Works
Harrison, N. J.

Blake-Knowles Works
East Cambridge, Mass.

Power & Mining Machinery Works
Cudahy, Wis.

Ingeco Engine Works
Cudahy, Wis.

Deane Works
Holyoke, Mass.

Laidlaw Works
Elmwood Place
Cincinnati, O.

Snow-Holly Works
Buffalo, N. Y.

Hazleton Works
Hazleton, Pa.

LARGEST MAKERS OF PUMPING AND MINING MACHINERY

THE GLOVER TYPE

THE LATEST METRIC HIG

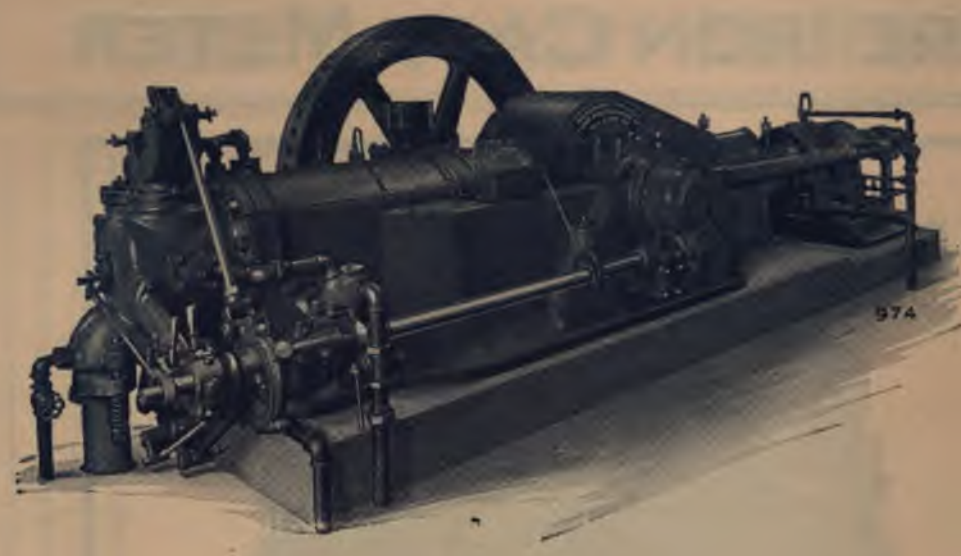
60 LIGHT "B"

200 lb. test with Volume and Pressure Recording Gauge

Slide Valve

Two Glove

THE DESIGN is the same as the other sizes, (5-B, 10-B, 20-B). The METRIC METAL WORKS product is in every respect dependable, durable and accurate. This meter contains the inside structure of a tin meter transposed to an Indestructible Iron Case.



Dependability!

TO render most efficient service in your factory, a gas engine must first of all be *dependable* — one that will furnish *continuous* and *adequate* power without costly delays, breakdowns and big repair bills. This

National Transit Gas Engine

represents the latest development in gas engine design — the result of our many years of experimental work and manufacturing experience in the gas and oil engine field.

Note the features of this engine, and you will understand why we claim "dependability" for it.

Ask for Bulletins of the N. T. Gas Engines — we manufacture many types and sizes, large or small. Address Dep't "N"

Some Features of Fig. 974, Type GH4A Cycle, Single Cylinder Engine Illustrated Above

Sturdily built.
Simple design.
Minimum number working parts.
Best materials and workmanship.
Engine and gas compressor cylinders are separated.
Ample provision made for expansion and contraction.
Quiet, easy motion insures long life.
Automatic lubrication.
Starts by compressed air.
Make and break type ignition.
Interchangeable crank shaft.
Trunk type piston.
Jahns centrifugal type governor.
Klein type mixing valve.

NATIONAL TRANSIT
PUMP AND MACHINE COMPANY

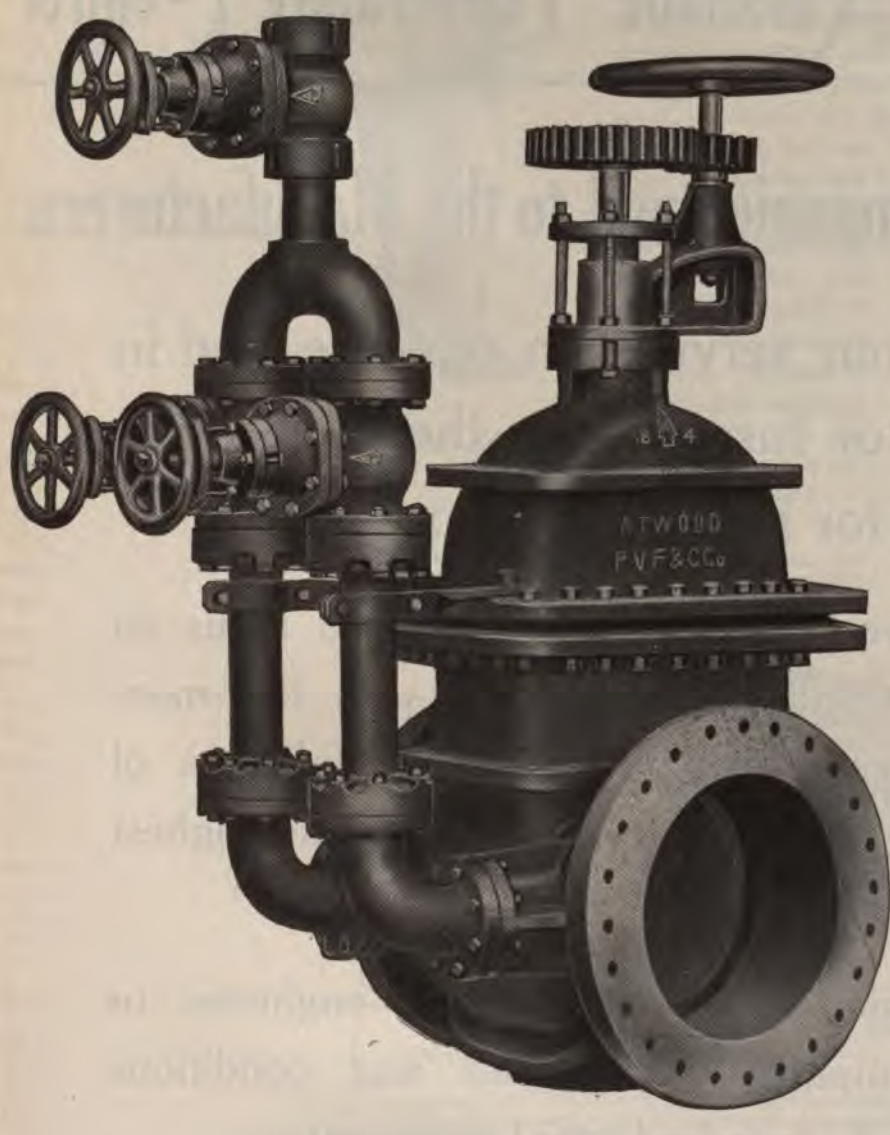
Main Offices and Factories - - OIL CITY, PA.

District Offices in NEW YORK, PHILADELPHIA, PITTSBURGH, KANSAS CITY

High Pressure Gas Line Valves and Fittings

FOR

NATURAL GAS



The illustration shown is an eighteen inch high pressure inside screw spur geared gas line gate valve with three valve riser blow-off by-pass.

This by-pass can be used to pass the gas around main valve, or to empty line on either side of main valve, when same is closed.

All of our high pressure valves are provided with a repacking feature on the stuffing box, which permits of readily repacking the valve with pressure on and valve open, by eliminating the very troublesome feature of having the gas blow through the stuffing box when packing is removed.

Pittsburgh Valve, Foundry & Construction Co.

Pittsburgh, Pa.

ENGINEERS FOUNDERS PIPE-FITTERS MACHINISTS

Pretty Soft, I Say!

"By George", muses Jones, as he takes a peek at glowing fire in the corner of the bathroom, "but this is great. Pretty soft to be able to take the old scrape mornings without clammily cold hands and chattering teeth. It sure feels good. Glad the wife thought of it. Used to take half an hour to heat up this house when we got up mornings — and the bathroom did not come in for much of it—had to shave in the cold. Blamed if I've enjoyed anything as much in a long time—and all I've got to do when I get through is to shut her off. You can't beat it."

(This is the kind of self-communing that sifts through the minds of men mornings in homes where a Humphrey Radiantfire has been installed in the bathroom.)

We've Made Many a Big Shaver Comfortable This Winter

No. 20.

Keep Up the Good Work

We prepared for stirring times when we commenced that Saturday Evening Post advertising campaign. We expected that The Humphrey Radiantfire dealers would see the advertising value of the series of newspaper ads., of which the above is a sample, and they did not disappoint us. They used the series all over the country. The way they have cooperated has been great. And the orders—they've nearly swamped us, but we're still afloat and waiting for more.

You see the people are saving their scarce fuel supply —checking their furnaces. Benefits them two ways. They get the necessary heat for less money. The Humphrey Radiantfire has certainly made good for the Nation! How is your stock of Radiantfires? You do not need to run short. Keep your orders coming along. We don't want you to disappoint a single customer.

General Gas Light Company

NEW YORK 44 W. Broadway — Kalamazoo, Mich. — SAN FRANCISCO 768 Mission St.

THE KELLY & JONES CO.

THE HOME OF KELLY & JONES PRODUCTS

VALVES AND FITTINGS

Our Line of Brass, Iron and Steel Valves and Fittings has been developed with the demand of engineering science, and the progress of the various industries.

A wide experience gained in designing and erecting steam heating and hydraulic engineering, made us familiar with the wants of the trade and shaped our manufacturing policy from its inception. This knowledge and experience, together with the location of our modern plant and its facilities, are responsible for the success of products bearing the K. J. mark.

Our catalog is a complete guide in the matter of specifying and buying valves and fittings, for steam, gas, water, air and oil.

SEND FOR A COPY TODAY

The Kelly & Jones Co.

Works at GREENSBURG, PENNSYLVANIA

OFFICES:

Chicago St. Louis San Francisco New York Pittsburgh Cincinnati

JUST TO ILLUSTRATE OXY-ACETYLENE WELDING

MAKING WELDED FITTINGS
NO FITTINGS TO LEAK — NO PIPE-ENDS WEAKENED BY THREADING

NOTE THE FLEXIBILITY OF A WELDED GAS LINE — Ready to Lay.

The "MILBURN" System of Oxy-Acetylene Welding and Cutting includes COMPLETE OUTFITS Illustrated and Described in BOOKLET 328 — No Charge.

THE ALEXANDER MILBURN CO.

1418-1428 W. Baltimore Street, BALTIMORE, U. S. A.
BRANCHES AND AGENTS EVERYWHERE

BRANCHES: NEW YORK, 51 E. 42nd St. CHICAGO, 1012 Kimball Bldg. BOSTON, 79 Milk St. PITTSBURGH, 606 Frick Bldg. WASHINGTON, 711 13th St., N. W.

Saves From 15% To 20% On Gas Consumption

The gas shortage last winter was serious in many districts and with the various government requirements it threatens to be even more so during the next cold season.

The situation can be decidedly helped and the individual greatly benefited by the installation of "Thermostatic Control" afforded with

The "MINNEAPOLIS" HEAT REGULATOR

The operation of the Thermostat closes the circuit when the temperature rises above or falls below the desired degree and the operation of the motor closes or opens the valve thus shutting off or letting on the supply of gas.

This device can be connected with any heating plant (Hot Air, Hot Water or Steam) whether it be a straight gas heater or a coal heater with gas burners.

It affords not only exact temperatures with a marked saving of fuel but also helps to make the home a place of comfort, health, and safety.

Every heating dealer should wisely recommend this device for all installations and improvements.

Every sale of a "Minneapolis" means prestige and profit to you with guaranteed satisfaction to all concerned.

A. C. Motor

Write our sales department for special folder and detailed information.

Model No. 55

MINNEAPOLIS HEAT REGULATOR COMPANY

Factory and General Offices, MINNEAPOLIS, MINN.

THE STANDARD OF PEACE IN THE KITCHEN

Between the range and the housewife --- between the housewife and the cook --- is the

"RUTZ" GAS-RANGE LIGHTER

IT IS RECOGNIZED AS STANDARD-EQUIPMENT ON MODERN FULLY EQUIPPED GAS RANGES

Try to sell a gas range without a "RUTZ" Lighter, then offer one with this Lighter --- note the result.

SPECIFIED BY HUNDREDS OF GAS COMPANIES WHEN ORDERING THEIR RANGES

When ordering ranges, be sure to specify THE "RUTZ" LIGHTER, make it a part of your Standard Equipment.

"Rutz" Selling Helps with sales points explained. They help the Gas Company.

Milwaukee Gas Specialty Co.

2015 Claybourne Street MILWAUKEE, WIS.

S. R. Dresser Manufacturing Company

BRADFORD, PENNA., U. S. A.

High Grade Pipe Couplings
Sleeves,
Clamps and Fittings,

Sizes 2" I. D. to 4" I. D. Inclusive

The Dresser All-Steel Coupling,
Style 38—Followers Pressed From Solid Plate.

Sizes 5⅝" I. D. to 10" O. D. Inclusive

Sizes 10" I. D. to 20" O. D. Inclusive

Dresser Stands for Quality, Workmanship and Finish

SEND FOR CATALOGUE and STATE REQUIREMENTS

The Verturi Meter for Measuring Natural Gas

The Type Q. S. Register-Indicator-Recorder plays an important role in measuring natural gas. This instrument is sturdy, reliable and compact in every detail. Three dials give complete and accurate information as to the flow of gas.

The upper dial furnishes a continuous record of flow on a 12" circular paper chart. The middle dial registers the total amount of gas which has passed through the Meter Tube. The lower dial indicates the momentary rate of flow of the gas.

Bulletin 86 N Furnishes Complete Information.

BUILDERS IRON FOUNDRY "Builders of the Venturi" PROVIDENCE, R. I.

New York Pittsburgh Chicago Atlanta San Francisco Portland, Ore. Toronto, Ont. Vancouver, B. C.

HELME & McILHENNY

1339-49 Cherry Street PHILADELPHIA, PA., U. S. A.

The "A" Meter—heavily built for high capacity. Especially successful in natural gas service.

Prepayment Meters to sell gas at any rate per thousand cubic feet.

Strong and simple mechanism.

GAS METERS

Prompt Shipments

Correspondence Invited