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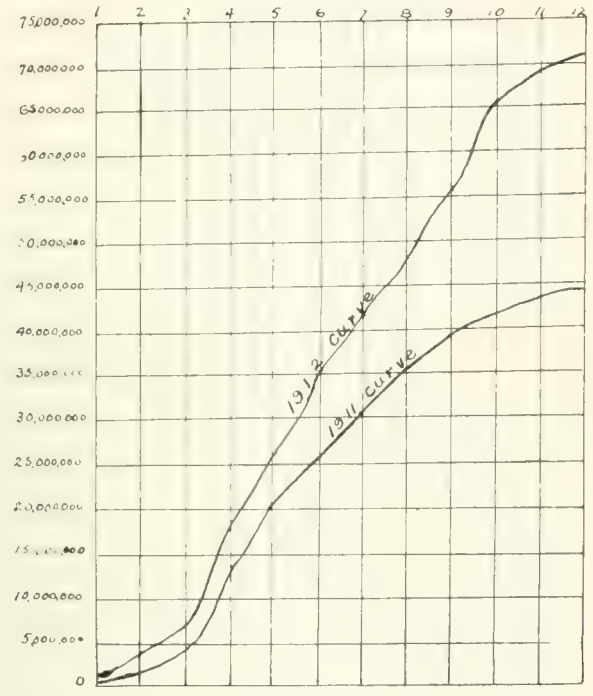


A Review of 1912 Building in Canada, Making Comparison Between East and West

By
Gordon C. Keith

Table of Building permits for Winnipeg, Regina, Edmonton and Calgary. This shows the increase of 1912 over 1911 and is characteristic of Canadian cities.

THE building statistics for 1912 show a wonderful progress in Canadian building trade in 1912. Even with the unprecedented value of building permits, the growth of Canada's population, shows that there is a house scarcity in a great number of the growing cities and towns. In some centres the scarcity is so acute that prices have increased enormously.

Taking Toronto as an example, the number of houses erected does not keep pace with the growth in population. This is proved by the increased prices of medium sized land. The following figures should also prove of interest, showing as they do, the amount of building being done in Toronto. As will be seen, figuring at the rate of five persons to a house, the number of houses erected was 4,361 less than required to house the rapidly increasing population.

The following figures for Toronto do not include North Toronto which was recently annexed, schools, clubhouses, factories, warehouses, garages, sheds or alterations to houses, etc:—

Permits for Houses in Toronto, 1909.

	Number.	Value.	Average Cost.
Brick	3,049	$8,899,315	$2,918
Roughcast	240	215,625	898
Brick veneer	102	155,550	1,525
Roughcast and brick	555	808,895	1,457
Frame	118	120,045	1,017
Total	4,064	$10,199,430	$2,509

House Permits in Toronto, 1910.

	Number.	Value.	Average Cost.
Brick	3,535	$9,907,377	$2,802
Roughcast	237	190,840	805
Roughcast and brick	600	866,950	1,445
Frame	383	280,675	733
Brick veneer	118	163,295	1,383
Total	4,873	$11,409,137	$2,341

House Permits in Toronto for 1911.

	Number.	Value.	Average Cost.
Brick	3,826	$10,456,875	$2,733
Roughcast	319	317,035	993
Roughcast and brick	870	1,281,220	1,472
Frame	422	345,180	818
Apartment	77	1,103,000	14,324
Total	5,514	$13,503,310	$2,450

House Permits in Toronto for 1912.

	Number.	Value.	Average Cost.
Brick	4,382	$11,864,925	$2,707
Roughcast	243	220,915	909
Roughcast and brick	779	1,174,700	1,508
Frame	271	230,645	851
Apartment	80	2,205,500	27,444
Total	5,755	$15,696,685	$2,727

Population of Toronto.

The population figures according to the assessment department are as follows:—

1908—281,201.
1909—325,302.
1910—341,991.
1911—374,667.
1912—410,036.

It will thus be seen that the increase in population of 1912 over 1908 is 122,835. Allowing five persons to a house, it would take 24,567 houses to provide for this increased population. The permits show that 20,206 were erected. In other words there should have been 4,361 more houses erected in the past four years to provide for the increased population.

The following comparative statement of the year's work has been handed out by the City Architect of Toronto, and is of interest:—

	1911.	1912.
Approx. value of all classes of buildings Jan. 1 to Dec. 31.	$24,374,539	$27,401,761
Approx. value of buildings for month of December	1,791,032	1,936,685
No. of building permits issued Jan. 1 to Dec. 31	7,296	7,173
No. of buildings for which permits were issued for Dec..	505	454
No. of new buildings erected from Jan. 1 to Dec. 31 ..	9,869	10,217

Calgary an Example of Westernn Growth.

It is of interest to note the enormous value of building permits of the various cities. In Calgary there are eight millions in excess of last year, and it will be of interest to compare this city with Toronto. According to the figures of the building department the building permits for 1912 reach the total of $20,394,220. In 1911 they were $12,907,638. The increase is therefore about 66 per cent., but even more remarkable than the increase is the fact that in 1912 it is divided comparatively equal through the year, whereas in 1911 the total was attained largely through two or three exceptional months. The biggest month in 1912 was September, when the totals pass the four million mark, but only two months in the year fell below one million, while in 1911 only 4 months reached that amount.

Another important feature which is commonly overlooked in connection with building returns is that these returns show the permits taken, not the actual building done. Much of the building of 1912 was done on 1911 permits; in fact the C. P. R. hotel and Hudson Bay store, two of the largest buildings now under construction in Calgary, do not appear in the 1912 returns, but were not included in those of 1911. Many of the buildings in the 1912 report have not been completed; some have not been commenced. It is apparent, therefore, that already greater building activity for 1913 is in sight for Calgary.

A classification of the building returns for 1912 show that permits were taken for the following:—

C.P.R. shops	$2,247,787
52 warehouses and factories	2,271,200
109 business buildings	4,402,920
2,173 residences, costing over $1,000 and under $4,000	4,744,900
243 residences over $4,000	1,899,200
44 apartment houses, hotels, etc.	1,243,200
12 schools	855,100
4 theatre buildings	384,000
3 government buildings	276,000
12 churches	253,210
4 firehalls	107,520
9 public stables	104,360
4 public garages	67,200
1 hospital	21,600
812 small buildings and alterations and extensions	452,620
Miscellaneous	33,345
Total for 1912	$20,394,220

The figures afford some interesting statistics. There were 2,416 new residences, which if reckoned at the rate of five persons to a house accounts for a new population of 10,000. As a matter of fact, five persons to the house is too low an estimate for Calgary, as the custom in that city is to build houses of good size and when occupied by small families rooms are rented to those who have no homes in the city. Aside from the residences there were 44 apartment houses and hotels, besides additions to residences and rooming houses already built. Altogether it may be reckoned that living accommodation for a new population of fully 15,000 persons is provided by the new buildings, which is well in line with the estimated increase of the city's population during the twelve months.

Taking a population of 75,000 as a basis it is found that the building permits of this city for the year 1912 amount to no less than $272 for every man, woman and child in Calgary, or approximately $1,300 per family—a remarkable record when it is remembered that these figures do not include the municipal expenditure upon street and similar public work, extensions of the street railway, electric light, water or sewerage systems, or the railway construction work in and about Calgary, which would bring the year's total several millions higher.

Record Progress of the Prairie Metropolis.

Permits show that $20,475,350 have been expended in new buildings within the city limits in Winnipeg during 1912. Over seventy apartment houses have been erected during the year, representing an expenditure of over $3,000,000. Three million dollars went into the building of new banks and office buildings in Winnipeg during the year and well over $1,250,000 was expended in new factories or in additions to old. The wholesale trade is represented by warehouses, costing $844,000. Theatres and places of amusement have been erected in almost every quarter of the city, $363,000 being expended in new moving picture houses alone, costing each over $10,000. 125 new homes have been added to Winnipeg's best residential districts, twenty-six new residences costing over $20,000 each, nine over $25,000 each and one $100,000. To the sum of over twenty million dollars expended in Winnipeg proper this year, may be added at least $8,000,000, a conservative estimate of new homes and public buildings in the immediately outlying suburbs.

Alberta's Capital City.

Edmonton, the capital city of Alberta, is a close second to Calgary, its population being about 60,000. Its population in 1901 was 2,626, so that in the intervening space of time it has increased 2,184 per cent. The phenomenal growth of this city is shown in the rateable assessment which in 1912 was treble that of 1911. In 1911 the assessment was $46,944,740, while for 1912 it was $123,512,590. Building permits for Edmonton were $16,000,000 in 1912.

Medicine Hat, Alberta, has a rateable assessment of $14,000,000 composed entirely of taxation on land at actual value. During 1912, $2,904,824 was expended in building operations. From a population of 5,750 in 1911 it has increased to nearly 12,000 in 1912.

In Moose Jaw, Sask., the rateable assessment jumped from $20,006,099 in 1911 to $56,755,468 in 1912. Building permits in 1912 were $4,990,300 compared with $2,475,736 in 1911, an increase of 51 per cent.

Lethbridge, Alberta, Prince Albert and Saskatoon are other cities that illustrate the growth of the West. It would be impossible to refer to all the numerous growing centres in the west, but the above illustrate the growing demand for builders' supplies. Regina, the capital city of Saskatchewan, is of interest, however, showing, as it does, the increasing demand for builders' materials.

Wonderful Development of Regina.

The building figures for Regina in 1912 show an increase of about 80 per cent. It had been expected by the building officials that the $7,500,000 mark would

be reached before the end of the year, and their estimate was not far out. The exact figures for buildings erected within the city limits are $8,047,309. In addition to these figures, the building permits in the annexes was $217,569.

Building in the East.

Figures for Toronto have been given as an example of the growth of eastern centres of population. A table of figures is given showing the permits issued by several eastern and western cities. It would hardly be possible to give an adequate idea of the aggregate amount spent in building operations during 1912.

Montreal's total building statistics for the year 1912 have been compiled by Mr. Alcide Chausee, superintendent of the City Building Department. The figures give the total building in Montreal for the year $26,116,958. The statistics are made up as follows: Permits for 1912, 3,792; value, $19,141,955, against 3,736 permits in 1911, totalling $14,579,952; additional buildings erected for which no city permit was required: Cote des Neiges Ward, $50,000; Longue Pointe Ward, $200,000; municipal buildings, $1,500,000; Harbor Commissioners' structures, $2,225,000; buildings which do not require structural strength, $2,560,000. These figures do not include the buildings erected in Westmount, Maisonneuve, Verdun and Outremont, which are in the district, but not in the city of Montreal.

The building permits of Fort William in 1911 were $3,077,800 and in 1912 were $4,211,285. The population in 1911 was 20,644, while in 1912 it was 25,000.

The following is the record of building permits in London in 1912, with comparisons with former years:

Year.	No. of Permits.	Amount.
1912	1,179	$1,136,108
1911	1,039	1,036,880
1910	882	805,074

Forty-six permits with an estimated value of $27,263 were granted in December, as against thirty-eight totalling $187,553 in 1911. Permits were granted for 295 residences in 1912 with a total estimated value of almost half a million dollars.

City.	1912.	1911.	1910.
Toronto	$27,401,761	$24,374,539	$21,127,783
Winnipeg	20,475,350	18,282,250	15,116,450
Hamilton	5,491,800	4,255,730	2,604,605
London	1,136,108	1,036,880	805,074
Berlin	842,613	356,091	347,556
Kingston	645,774	314,569	220,092
Outremont	1,582,000	1,317,700	832,900
St. Catharines	811,335	265,435	.....
Stratford	367,233	103,532	185,436
Owen Sound	310,000	189,000	.....
Fort William	4,211,285	3,077,860	.....
Preston	337,160	244,375	.....
Guelph	388,499	513,690	135,700
Ottawa	3,621,850	2,997,610	3,022,650
Port Arthur	2,494,179	595,180	892,681
Brantford	1,167,105	613,860	681,030
Sudbury	527,000	.....	.....
North Bay	462,675	.....	.....
Montreal	19,141,955	14,579,952	15,815,859
Saskatoon	7,628,405	490,000	2,817,771
Regina	6,132,700	5,088,110	2,416,288
Brandon	1,138,514	1,108,129	1,224,385
Calgary	20,394,220	12,709,478	5,589,594
Edmonton	16,000,000	3,797,525	2,161,356
Lethbridge	1,426,445	1,033,980	1,211,310
Medicine Hat	2,904,824	450,000	427,140
Moose Jaw	4,990,300	2,475,736	1,071,090
Prince Albert	2,009,375	921,145	662,475

A comparison of figures for 1911 and 1912 shows that Berlin made a large increase in the year, having more than doubled last year's total. The expansion of its industries is accountable for a large amount of the increase. Kingston has doubled last year's total, and St. Catharines and Stratford more than trebeled their respective records in 1911. Hamilton has more than doubled its permits in two years.

Conditions throughout the year 1912 have been excellent, and it is evident that the demand for building supplies generally, during 1913, will be as pressing as in 1912. There are no immediate signs of a diminishing demand. On the other hand, there is every prospect of the 1912 records being broken in 1913.

Various Methods of Slating a Roof

Whatever material may be used for covering roofs, it must not only be light and durable, but must be so applied that the roof is made impervious to water, for this latter is the most essential point in roofing. Slates compare very favorably with any of the other materials used for this purpose, being light and durable, and readily adapting themselves to the exigencies of roof covering, says a writer in a recent issue of the Building World of London. Slating consists in overlapping the tops of one row of slates with another row to a certain determined depth, in order to break joint, and this operation is repeated until the work is finished. Fig. 1 shows how the joints are broken.

The lap is the most important part of slating, and it varies according to the gradient of the roof; a lap, for instance, that would be suitable for a roof with a gradient of 1 in 6, could not be used on a spire with a gradient to 6 in 1. And, again, a lap that would be sufficient for any ordinary rainfall would be found defective if the rain was driven by violent winds, especially in exposed places. Discrimination, therefore, is necessary in setting out a roof; the lap of slating must be varied according to circumstances, being from 2 inches to 4 inches on "count," and up to 6 inches on "ton" slates.

Slates vary in size from 13 inches to more than 36 inches in length. The size should always be mentioned

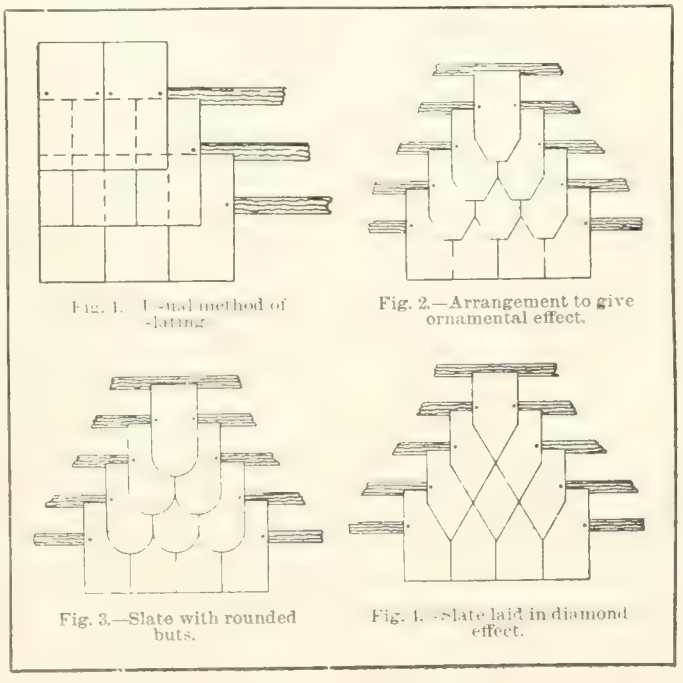


Fig. 1. Usual method of slating.

Fig. 2.—Arrangement to give ornamental effect.

Fig. 3.—Slate with rounded buts.

Fig. 4.—Slate laid in diamond effect.

in inches. Up to a certain size they are sold by count (120 to the 100) or by the square, beyond which they are sold by weight, and are called "ton" slates. The largest and thickest slates should always be used at the bottom of the roof, the smaller and lighter ones being worked up to the top. Slates have distinctive names, according to sizes, as "doubles," "ladies," "countesses," "duchesses," "rags," "queens," etc. Slates vary very much in quality, according to the district from which they are obtained, the distinctive marks of texture and color, etc., being very apparent; but as the question of quality is one that seldom affects operative slaters, the matter need not be further considered.

An ordinary outfit for the slater consists of a slate-knife, a pickhammer with claw, a 2-foot rule, and a straightedge correctly ruled for gauging, a dressing block, consisting of a piece of 1-inch by ½-inch or 1½-inch by ¼-inch iron about two feet long, with the ends sharpened and turned down about five inches for driving in a block, a slate-ripper, a trowel, and a chalk line, constitute an ordinary outfit.

Some roofs, such as churches, spires, etc., require no setting-out in the ordinary sense of the term, being generally boarded all over. But on the ordinary roofs battens from 1½ inches to 3 inches wide are used for nailing the slates to, and these must be so set out as to receive each course of slates exactly where required. Half only of the width of battens should be used for nailing the slates to, the other half being allowed for carrying the top of the preceding course of slates. As an illustration of setting-out, suppose a roof is to be slated with 24-inch by 12-inch slates with a 3-inch lap, 2-inch battens to be used. The first thing is to get the place on the slate for holing. Deducting the 3-inch lap from 24 inches (the length) leaves 21 inches; half 21 inches = 10½ inches; the 3-inch lap added to 10½ inches = 13½ inches; thus the slate must be holed 13½ inches from the bottom. This same rule applies to all slates, whatever their size or the lap required. Deduct the lap from the length, halve the remainder, and add the lap to the quotient. The resulting sum gives the distance measured from the bottom of the slate at which the holes are to be made. The bases of the spars or rafters should have a piece of bevelled stuff nailed to them, so as to form a proper springing for the eaves course, otherwise the first course will not lie flat. Now allowing a 2-inch projection over the gutter, and 1 inch of the batten to rest the top of the slate upon, the bottom of the first batten must be nailed to the spars 10½ inches from the back of gutter. To fix this batten correctly, strike a chalk line across the spars at 10½ inches from the gutter, then nail the batten down. The next thing is to find the space between the top of the first batten and the bottom of the second, as every batten to the apex of the roof is simply a repetition of this same size. Deducting 2 inches for gutter and 1 inch for batten out of the 24 inches, we have 21 inches. Thus the bottom of the second batten must be nailed down at 21 inches from the back of the gutter, and the space between the two battens when measured will be found to be 8½ inches. Totalled up, we have of this 24 inches as follows: Gutter, 2 inches; first space, 10½ inches; first batten, 2 inches; second space, 8½ inches; second batten, 1 inch = 24 inches. As all other battens will require to be 8½ inches apart, a piece of batten 8½ inches long can be cut to serve as a guide for each course of battens, the roof being battened before any slates are laid.

Under this title are placed such roofs as are not exactly square roofs for diminishing courses, etc. In the case of oblique or obtuse forms, it is necessary that the courses shall be kept square with the ridge, and any course that is short of the full width must be placed at the bottom. It is easy to determine this by dividing the courses into the width of the roof at the widest part, and if any part of a course remains over, place it at the bottom. A course of slates is half the slate after deducting the lamp. By squaring the widest part (or the nearest to it that the courses allow) with the narrowest, and running a batten through where the course requires, the rest can be worked downward and then upward to the ridge. The most convenient way is to use a square for the first course, whether it be a full or a broken one, working to the top in the usual way. This gives some support for the feet—a necessity on a steep roof.

The object of diminishing courses is to give to a roof an appearance of greater depth than it really possesses, as well as to break up the sameness resulting from the use of slates of uniform length. The use of "ton" slates sometimes necessitates this mode of setting out a roof, but it more frequently occurs owing to the compulsory use of Westmorland slates. So long as the sizes are known beforehand, there is no more difficulty in setting out a roof of this kind than in an ordinary one. Commencing with the largest courses, as each course diminishes, the difference between it and the course beneath it is halved, and the batten and nailhole lowered to that extent; a uniform lap must always be maintained.

Slate Should Be Nailed at Shoulder.

All slates should be nailed at the shoulder with two nails, one on each side. They should be holed from the bed side, so that when the hole is made, sufficient slate is knocked off the surface to allow the nailhead to lie flat with the surface of the slate. The side of a slate where the edges are roughly chamfered is the surface. To hole slates with uniformity, a gauge is required, and the ruled straightedge is generally used for this purpose, but a stop must be placed on it. A temporary one, sufficient for all practical purposes, can be made from a piece of batten about two feet long; drive a nail through it at a distance of 15 inches from one end; and, for holing 24-inch by 12-inch slates at 13½ inches, measure 13½ inches from this nail, and at this point drive another partly through to act as a marker. With this gauge the slates can be accurately and uniformly marked, and may then be holed with a machine, or with a slate-knife or slate-hammer. There are various kinds of slate nails on the market, such as malleable, light and heavy clouts, zinc, etc., which, being cheaper, are more generally used than copper. Malleable and light galvanized clouts oxidate in a few years, necessitating constant repairs, and therefore should be used sparingly. Heavy galvanized clouts, or copper nails, should invariably be used on buildings exposed to chemical fumes.

To relieve the monotony of ordinary slating, a combination of colored slates on a broad, prominent roof is effective. Three or four good combinations may be obtained with no more expenditure of time than is occupied in ordinary slating. Ornament proper in slating consists in cutting the slates to form certain patterns, as shown by Figs. 2, 3, and 4.

Excited Passenger—"Can I catch the two o'clock express for New York?"

Railway Official (calmly)—"That depends on how fast you can run as it started five minutes ago."

A $5,000 Concrete Block and Stucco House, size 28 x 40 ft., 10 rooms, hot air heat, erected for A. H. Dunning, McKellar Townsite, Ottawa, by Boyd Bros., Osgoode.

Houses of Stucco Finish on Concrete Blocks

In the November issue of The Canadian Builder, a concrete bungalow was described. This was the White Concrete Bungalow, built by Sheldon Bros., Maywood, Ill.; architect, Robt. B. Seyfarth, Corn Exchange Bank Building, Chicago, Ill.; owner, Kenneth K. Bullard, 220 North 2nd Ave., Maywood, Ill.; block layer, John Lewald; frontage 30 feet, depth 46 feet 8 inches; 3,500 8 x 8 x 16-inch stucco blocks used. The bungalow has Ideal Concrete Block foundation, contains five rooms, has hot water heat, is dry and sanitary. Two coats of stucco were applied to the blocks and given a smooth finish. House and block work $1,550, cost of building complete $6,500.

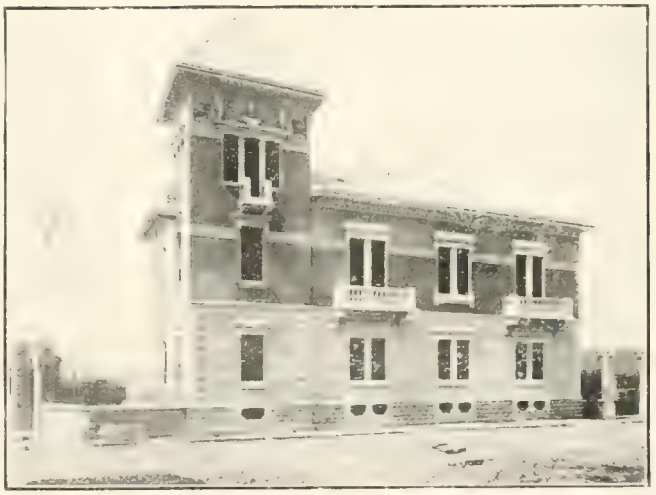
Supplementing the above information, the first stucco work done in connection with blocks made by the Ideal machine was at Westbury, Long Island, on a house built by Frank Powers. When Mr. Powers took these photos some years ago, they suggested additional possibilities by the use of concrete blocks and since this building has been put up a large number of residences have been erected of rough concrete blocks and the exterior walls finished in stucco.

A very handsome bungalow was built some years ago for Dr. Harter, Elkhart, Ind., by P. T. Longacher. Mr. E. Hill Turnock, of Elkhart, was the architect. This building sits between the street and the St. Joe River on the bank, and on the river side the building presents the colonial style in appearance. It has been admitted by all who have seen it as one of the handsomest residences in the country. The bungalow was constructed of blocks using very coarse aggregate so that the stucco would adhere solidly. The lower part up to the second storey sill line is in pebble dash buff color. The upper storey is in smooth or scratch coat-light grey finish. The interesting point about stucco on concrete blocks was brought out in connection with this building. The work was completed about December, and the day the final coat of stucco was put on the weather changed to quite severe cold through the night and the contractor was very much worried about the fresh stucco finish cracking from cold or frost. Mr. Longacher stated that he got up before 6 next morning and went over to see what shape the building was in, fully expecting that the stucco would be cracked and in very bad condition so that it would have to be done over. He was agreeably surprised by finding the stucco finish in first-class shape. The building has been occupied now some three years or more and is in excellent condition to-day.

Stucco on concrete blocks has come into general use in the States but there are, as yet, few instances of its use in Canada. There are a number of factories at Elkhart, Ind., built with blocks-stucco finish. This has also been adopted in the foreign countries where concrete block machines are sold. One of the finest pieces of work ever made with the block machine is a castle at Buenos Ayres, South America. This type of construction has been used at Milan, Italy, one of these concrete-block-stucco buildings being illustrated herewith.

This very beautiful and artistic residence was built on the shores of that renowned resort Lake Maggiore, and was built for an Italian Banker. The entire residence including the foundation, Basement, Elevation, and all walls were built of Ideal Concrete Building Blocks, the exposed blocks being faced and waterproofed with Tycrete Waterproofing Compound while the upper storey concrete blocks were stuccoed. The interior plastering was placed right on the blocks. 11,700 blocks were used and all the ornamental parts were moulded with the use of white concrete. The cost of the building complete with all fixtures both inside and out was $28,000.

The adoption of stucco finish on blocks led manufacturers of machines to get up a set of plates and doors with which blocks may be made particularly adapted to take stucco finish. Blocks made on these plates have a heavy corrugated surface, the channels



Building erected of concrete blocks in Milan, Italy.

Musical Instrument Factory of Concrete Blocks in Course of Construction.

being about ½ inch deep. These blocks are made with very coarse aggregate so that cement stucco will adhere to them very strongly.

It has been found that by using concrete blocks made with coarse aggregate or with a special stucco face they form an excellent base on which to apply cement stucco. These blocks can be made very cheaply, and as the stucco is generally made waterproof when applied to the blocks it gives an absolutely waterproof and tight building. What is meant by tight building, is that the cement stucco applied on concrete blocks absolutely excludes the outside air. It has been the experience of makers of machines in many cases where complaints were made that concrete blocks were not damp-proof that the moisture came in through the joints. This, is was claimed, was due to careless masonry work in setting up the building, and that concrete stucco on blocks precludes any possibility of this trouble. As cement stucco is applied on concrete blocks no trouble is experienced in the matter of shrinkage and cracks as the work matures. It gives also a permanent fire, frost, and damp-proof construction, requiring no future repairs.

The stucco finished house is very adaptable to paint

Stucco Bungalow of Dr. Harter at Elkhart, Indiana.

Musical Instrument Factory of Concrete Blocks with Stucco Finish

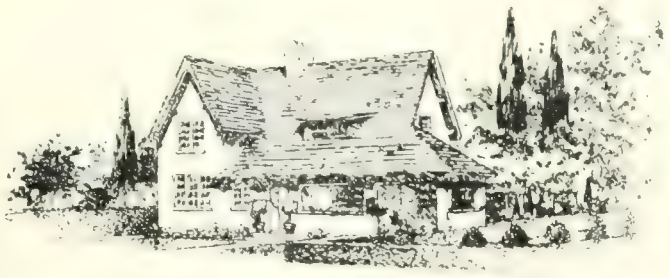
treatment, and in the event of any person desiring to change the appearance of a stucco building, it is practically the same operation and expense as a frame dwelling to point it. The illustrations are used by courtesy of the Ideal Concrete Machinery Co.

A ten-storey apartment house to contain a shade under three thousand rooms and to cost two million dollars is projected for Toronto. The apartment will be the largest in the world, and will be started within a year by local capital on a site already purchased. Joseph Thatcher of Mallory and Thatcher, the architects who have built all the largest apartments in town, 25 altogether, said yesterday that nothing stood in the way of the plans maturing. He and the chief financial promoter go to England and the continent in June, returning through the States to study the most modern methods of erecting and equipping large apartment houses. The site of the great structure is in the vicinity of College and Spadina Avenue. The building itself will have 300 feet front and 240 feet depth. —Toronto World.

Stucco Bungalow of Dr. Harter at Elkhart, Indiana.

Stucco Bungalow of Dr. Harter at Elkhart, Indiana.

Stucco Bungalow at Elkhart, Indiana, showing Concrete Blocks before Stucco was applied.



Perspective view for a poured concrete house to cost $3,000.

Prize House of Poured Concrete. Cost $3,000

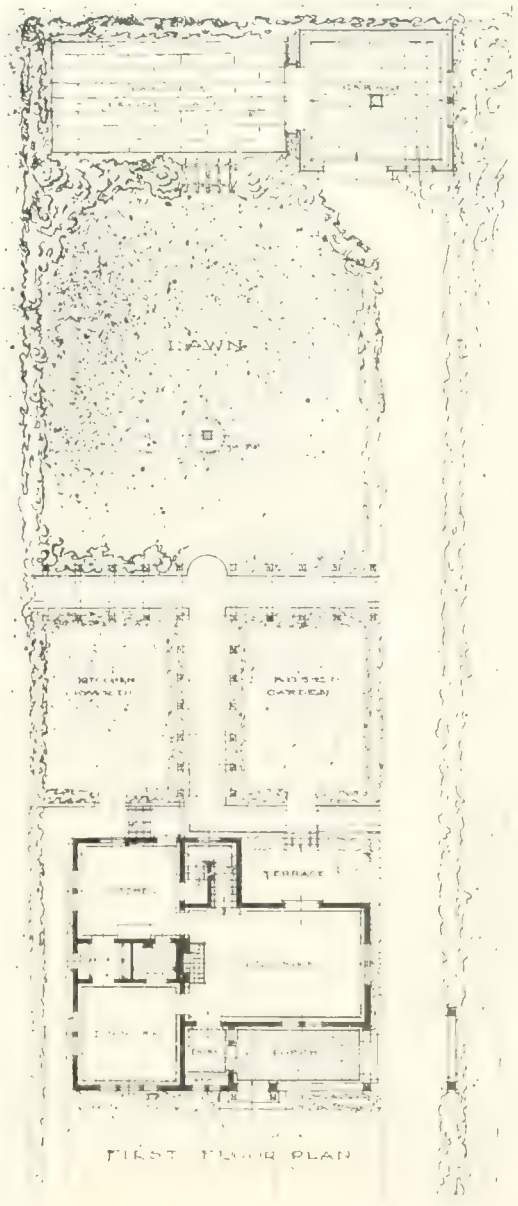
Architect: E. Parimiter

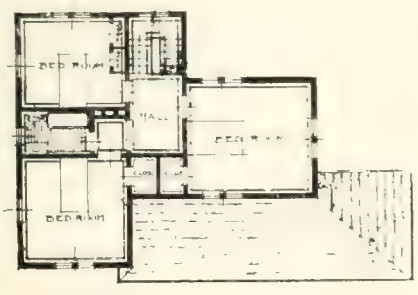
THIS page offers a suggestion for home builders—a poured concrete house, illustrated in perspective with floor plans and proposed ground arrangement. The design is by E. Parmiter, New York City, and was awarded first prize in a competition conducted by the Blaw Steel Construction Co., the designs being judged by Prof. A. D. F. Hamlin, Columbia University.

The exterior walls and foundations are to be of concrete, the exterior plastered with cement stucco. Other construction details are wooden floors, stud partitions, shingle roof, stained, house heated by hot air and wired for electric lights. Prof. Hamlin comments:

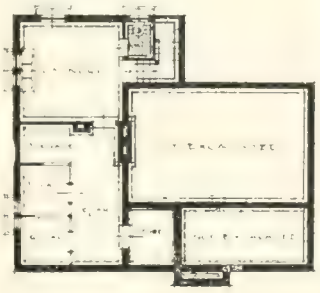
"The best of all the plans from the point of view of simplicity, spaciousness and general convenience. Adequate entrance lobby; living room admirable, 13' 6" x 21' 6"; dining room fair, 12' x 12'; kitchen excellent, 12' x 12'; pantry; three bed rooms, 13' 6" x 14' 6", 12' x 12', 10' 6" x 12', each with closet; bath room 8' x 5½'; all have good head room; all rooms well lighted; good porch. Plan of second story superposes well on first, one chimney stack. Exterior simple and attractive, good lines and masses, simple roof. Plan of grounds shows admirable taste. Entire design shows artistic skill and taste. Cubic contents, exclusive of porch, 15,773' from cellar floor to middle of height of gable roof; porches, 2,480 cu. ft."

It is proposed to build this house under ordinary circumstances for $3,000.





SECOND FLOOR PLAN



BASEMENT PLAN

Brick House Built at a Cost of $4,200

Erected for Henry Bunger
Architect, F. J. Grodavent

THE brick house shown in the plans herewith was erected for a family of five. The size is 24 x 30 feet with a height of 9 feet for the first storey and 8 feet for the second storey; a height of 7 feet for first storey openings and 6 feet 8 inches for the second storey openings. Plans and description are given by courtesy of The Building Age.

The footings are of brick. The basement and first storey walls are of brick 13 in. thick, while the second storey walls are of brick and 9 in. thick. The bricks are all laid in white lime mortar. The exposed walls and chimneys are faced with dark red pressed brick with rodded joints. The square head openings in the first storey brick walls are supported upon steel angles with the brickwork carried across in regular bond. The openings in the second storey have rowlock arches behind the wood frieze of the cornice.

Across the entire front is a covered porch with turned columns having square base. The entrance steps and porch floor are of concrete with stone capped brick walls enclosing the porch. The rear entrance steps and floor of the entry are of concrete similar to those at the front porch.

The roofs, sides of dormers and projections at second storey hall are covered with tongued and grooved fir boards about 8 in. wide, over which is placed a medium weight of red roofing paper with cedar shingles laid 4½ in. to the weather on the roofs and 5 in. to the weather on the vertical surfaces.

Interior Finish.

The inside walls and ceilings of the house are plastered with hard wall plaster put on in two coats of "Drawn" or "Double-Up Work," using one part of fibered plaster to 3 parts sand, and after being thoroughly dry finished with a white coat of plaster of Paris mixed with lime putty. All angles are protected with metal corners of recognized merit.

The front entrance is provided with an oak door having plate glass panel. The upper sash in the parlor, library and dining room are glazed with stained and leaded glass. All sash in double windows are hung with cords and weights on axle pulleys.

Double floors are used throughout the house, the under floor being common stock of 1 x 8 in. fir, with square edge laid diagonally, over which was placed a good weight of carpet paper, and this in turn covered with ⅞ x 3 in. quarter sawed fir flooring.

All inside trim is in hard pine, finished natural. The main rooms on the first storey have picture molding.

Kitchen Equipment.

The kitchen is small but meets all requirements as the commodious pantry contains all necessary cupboards and a white enameled sink conveniently placed to the dining room and kitchen, while the arrangement avoids direct communication between the two rooms. The back entrance to the kitchen forms a small covered way, and with the pantry is under the same roof. From the kitchen, stairs lead down to a great entrance platform, thence to the cellar, where the front portion is separated from the rear by a brick wall and is partitioned into two rooms, one being utilized for the furnace and coal and the other for a store room, while the rear portion of the cellar is divided into laundry, store room and dark closet for canned goods. The cellar stairs starting from the laundry are convenient for the laundry, furnace room and for outdoor service without passing through the kitchen.

A feature in connection with the stairs is that no winders are used and each flight has a platform. It will be noticed that the main flight of stairs to the second storey is boxed to the landing platform and then left open and the open stairs well protected with a railing.

Referring to the dimensions on the second floor plan it will be noticed that the three bedrooms are of the same size and each is provided with a closet and two windows. The bath room is larger than usually found in similar houses of like dimensions; enamelled open plumbing fixtures are used; the water closet has low down tank and is of vitreous earthenware. The bath tub, lavatory and pantry sink are cast iron, white enamelled, and the sink is provided with white enamelled back.

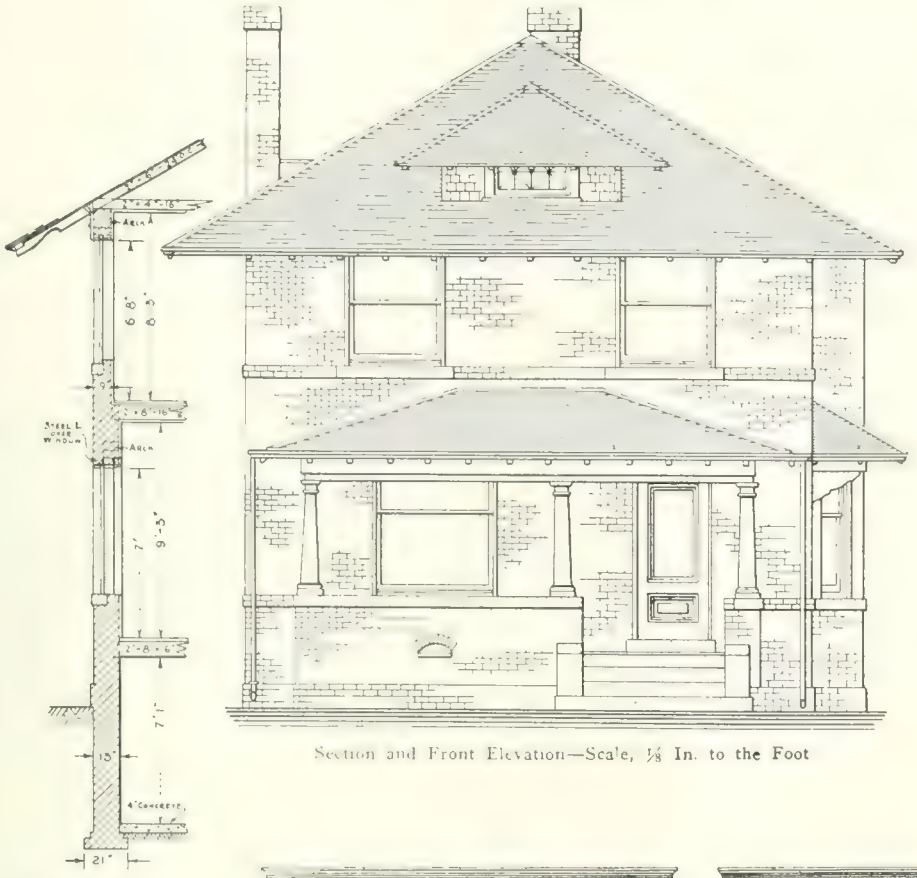
Cleaning Brick Walls

A solution of about 2 oz. of muriatic acid to 5 gallons of water makes a good wash for cleaning brick walls. This wash should be applied and the wall scrubbed down with a wire brush made for this purpose. Care should be taken to keep the solution from touching the hands or clothes.

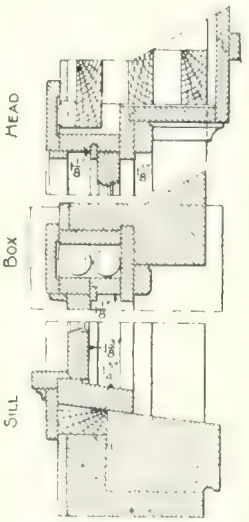
Found the Canadian Builder Useful

"I have been a subscriber to The Canadian Builder only a short time but I have found many things to my advantage. I am well pleased with your paper."—S. E. Mercer.

Mr. T. R. Deason, President and General Manager of the Manitoba Bridge & Iron Works, Limited, Winnipeg, Man., has been elected Mayor of Winnipeg by a large majority.



Section and Front Elevation—Scale, ⅛ In. to the Foot



Details of Second-Story Box Window Frames —Scale, 1 In. to the Foot

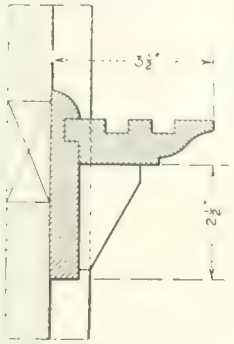
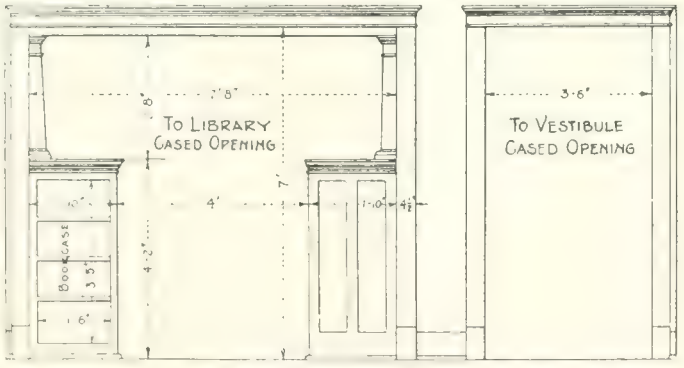
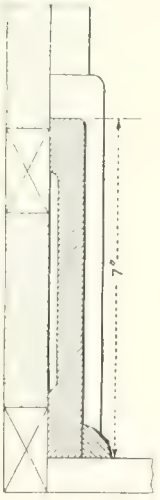


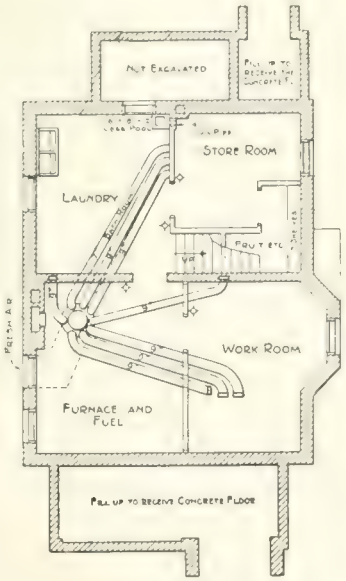
Plate Rail—Scale, 3 In. to the Foot



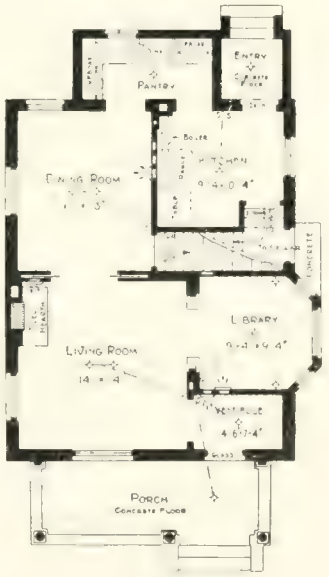
Details of Cased Opening Between Living-Room and Library and Vestibule—Scale, ¼ In. to the Foot



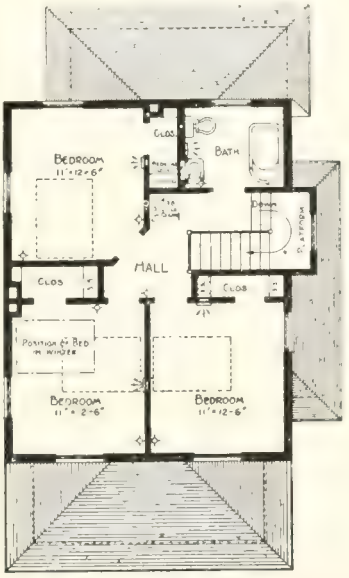
Detail of Base—Scale, 3 In. to the Foot



Cellar and Foundation Plan—Scale, 1/16 In. to the Foot



First Floor Plan—Scale, 1/16 In. to the Foot



Second Floor Plan—Scale, 1/16 In. to the Foot

Suggestions for Keeping Money Coming in During the Winter

A Collection of Ideas given by Builders and Carpenters showing how they turn spare time during the Winter into profit

To Keep the Dollars Coming In

By Fred Eberle

No able bodied man can afford to loaf around "even part time." He owes it to his family and to himself to turn every hour to account. A mechanic can always turn his shoulder to the wheel, should there be any depression in the trade. The time for the carpenter to pitch his hay is in the summer. Average energetic builders prepare their dwellings so that they can be finished during the winter months. A man who does a little extra effort, generally has his work lined up for the winter. My hobby in my spare time in the winter is architecture and designs, which I stick to all winter. This helps to make dollars in the summer. One can make old designs in china cabinets, furniture, etc., and thus make a fair wage during the winter months.

* * *

Figures Plans and Acting as Agent in Winter

By Archibald McLean

I have arranged my work so that I have no spare time in the winter months. I build schoolhouses, farm houses and barns in the summer. I generally arrange to have my last house in the fall enclosed so as to have it plastered before the frost. This house keeps me busy during December finishing it. I built the barns in the spring so as to have them ready for the July hay crop. I keep busy in January drawing plans and making out bills of timber to have them ready for the portable saw mill when it comes along.

As I am agent for the Preston Metal Shingle & Siding Co., I keep busy during February securing orders for their safe-lock shingle for houses, and their corrugated galvanized iron for barns.

* * *

Making House Furniture in Spare Time

By J. C. Barnard

I think the first thing to do to keep busy in the winter months, is to ascertain in each locality what the demand is for, whether for useful articles or articles that can only be bought by rich people, and may be considered luxuries. Under the head of useful articles I have made the following articles: Kitchen cabinets, grain sprouters, all kinds of mission furniture.

One winter I made by hand six kitchen cabinets out of yellow pine that I sold for $25.00 apiece. I made good wages on these. There is good money in different pieces of mission furniture. If the locality in which a person lives is a good one for chickens, good money can be made making grain sprouters; any chicken man will buy one when it is demonstrated to him.

Last winter I made a great number of ladies' handkerchief and neckwear boxes. These were about 12 inches long, 8 inches wide, 4½ inches deep, all veneered with curly walnut and piano finished, lined inside with satin, very tastefully, and small mirror in lid. I could place these faster than I could make them. They make a splendid present. Making them is like play. One can have half a dozen on the way at one time and it fills in so well while doing other work. The satin work can be done by a good fire on a cold winter's night and the good wife can help, too.

I have also been very successgul making grafonola tables. I cut advertised prices $100 and then make money. I obtain the material from a veneer company and the graphophone I buy from the Columbia people. I can build one in two weeks, the finishing takes two weeks' time, but only about two days' actual labor. They are good sellers, if you are in a locality where people can afford a piece of furniture like this.

It depends a good deal on the man; if he will use his powers of observation and his brains he will soon find out what there is a demand for, and in many cases he can help to make a demand for his work.—American Carpenter and Builder.

* * *

Has a Shop in Which He Works in Winter

By Ben Johnson

I will tell you how to keep busy and some of the things I do while I am busy.

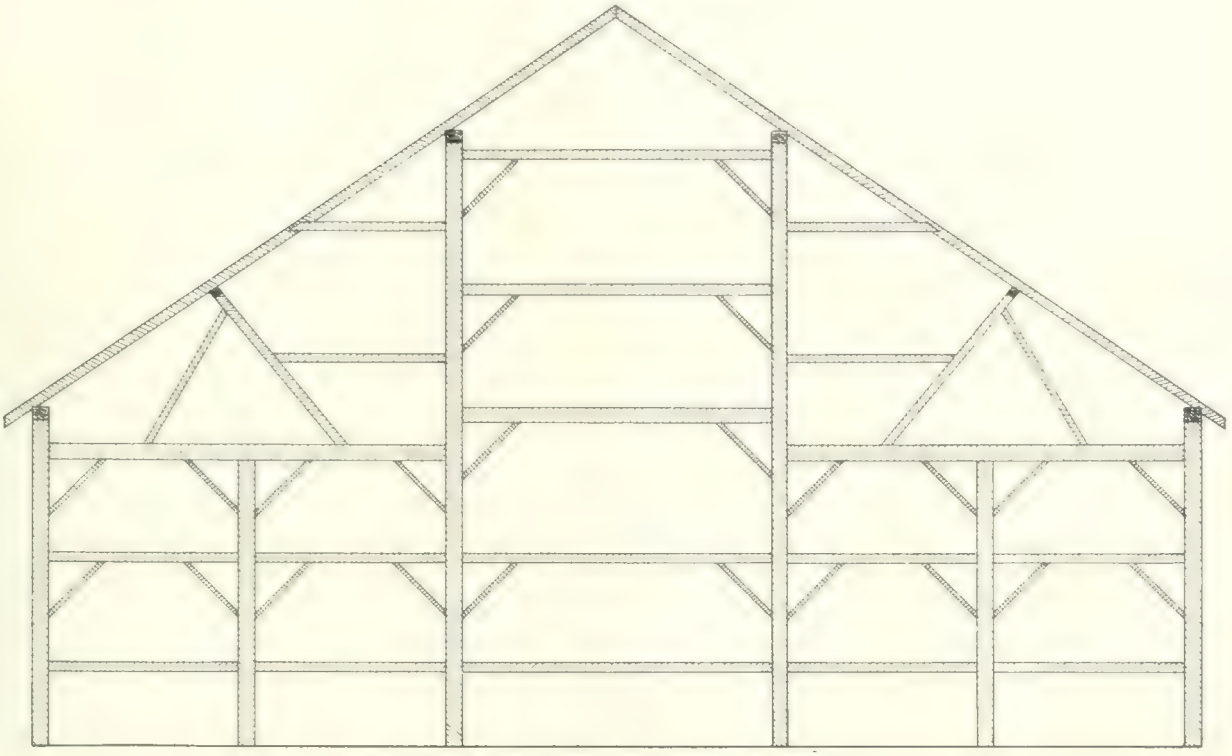
I have a work shop with a stove in it on my lot at home. I can work all kinds of weather in my shop, where I have tools to do most any kind of work that comes my way. I make it a rule to make or repair anything the people want. Here is a list of some of the things I do and have done: I repair all kinds of furniture and varnish some also. I have a pretty fair trade in this line for the winter months. I make screens of all kinds, hot bed sash for the gardeners, skirt boxes for the ladies, folding ironing boards, folding clothes driers, sometimes a flour chest, do clock shelves, book shelves, window seats, folding tables, small cabinets, or a nest of drawers for some special purpose, towel rollers, door steps, lattice for porches, repair washing machines, window and door frames, have made wagon beds and hay frames for wagons, frames for grind stones, and I once made a new frame, including all the wood work for a pile driver for the road commissioners.

You can see there is nothing too large or too small for me to undertake. It is very seldom I am out of work. I go to the houses and set window glasses, repair the door locks, do saw filing, put in new sash cord, sometimes I have a store room to remodel for a new occupant. I quite often have some outside work on hand and when we have some nice days to work outside I get out on these jobs, but when the weather is cold and stormy I let the outside jobs rest. It would be hard for me to name the many, many things I have made and repaired during the winter months.

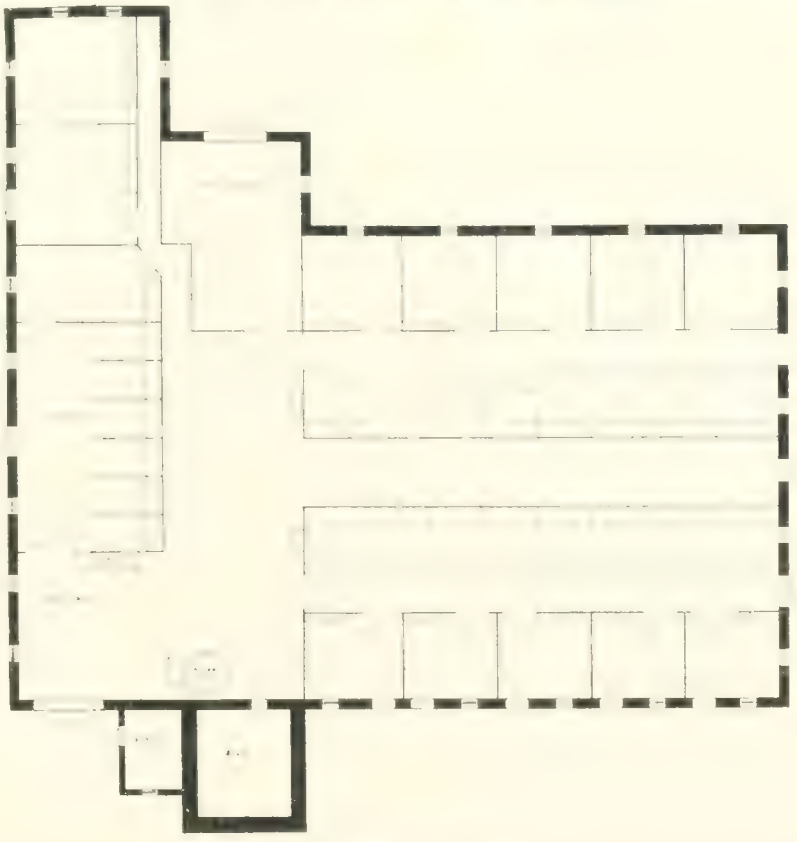
I do not bother with much of this class of work after the spring work begins. I have some customers

(Continued on page 26.)

Ideal Barn Plans



62 ft. wide x 18 ft. post. Suggestion for elevation.



100 ft. long x 62 ft. wide.

By A. E. ROBSON, Elderton, Ont. COURTESY OF THE METAL SHINGLE & SIDING CO., PRESTON

(Continued from page 25.)

who save such repair work until I begin work in the shop. I have been in this town over fifteen years and am pretty well known, therefore I do not have to look for work. The people look for me.

Of course, one not so well known would have to drum up trade and let the people know what he is capable of doing. After he has a good business established, the work will come in fast enough most of the time. To make a success of the business, as well as any other in the carpenter line, he should be a good workman. He should be honest and when people learn that he can be depended upon he will have no cause to complain of having nothing to do.

He should be quick to see into things, for some will want a thing made, telling you what it is to be used for, than ask if you can make it. Of course you can, and you will need to be something of an inventor as well as a mechanic. You should be able to see things in your mind before they are begun, as well as with your eyes after it is done. If he is a good draftsman, so much the better—it comes in pretty handy. Now, a man doing this class of work will have jobs come in which he will not like to do, but they must be done or he may lose a better one some other time. He should be ready to do anything the people want, if it can be done, and they are willing to pay for it.

You can see how all furnishes employment, and will bring in quite a bit of cash during the bad weather. It is much better than holding down a dry goods box up town.

The winter will soon pass; time does not drag so when we are busy. You will be toughened for work and will be ready for the spring opening.

Try it, brother carpenters, and be convinced.—National Builder.

Helped by Portable Woodworker and Gas Engine

By Wm. M. Johnson

I have a portable woodworker for use with a four horsepower gasoline engine, which is detachable. During the pleasant days of the winter months I use this engine to saw wood and poles. When the weather is bad the engine runs the machinery in the shop and I find plenty of shop work, such as cabinet making and repairing, either furniture or farm implements, to keep the men and myself busy.

I find it pays to keep a good man and this can not be done unless work can be guaranteed. Also a boss is a poor stick who cannot or does not find work for a good man.

On the other hand these two methods furnish advertisement and a good chance to talk better building both in construction and material to be used.—American Carpenter and Builder.

Town Planning Convention

The Town-planning and Civic Improvement Association was successfully launched at Berlin on December 11, 1912, at a large and representative meeting in Victoria Hall. Among the cities and towns represented were Toronto, St. Catharines, Peterboro, Oshawa, Preston, Galt, Sarnia, St. Thomas, Hespeler, St. Mary's, Parkhill, and there was a large attendance of leading citizens of Berlin. Mayor Schmalz welcomed the visitors from outside municipalities, and Mayor F. Stewart, Galt., was appointed chairman of the meeting. Following an address by C. H. Mitchell, C.E., Toronto, a resolution providing for the organization of an association was unanimously endorsed, brief addresses being delivered by the movers and Messrs. Edmund Burke, Toronto; J. Crummer, St. Catharines, and Dr. C. A. Hodgetts, representing the Conservation Commission.

Co-operation of Commission.

Dr. Hodgetts assured the association of the hearty co-operation of the Commission in an effort to secure legislation providing for housing and town-planning enactments for Ontario similar to that existing in New Brunswick. He maintained that Ontario was in the background in legislation providing for civic improvement. The efforts of the Commission, he stated, were handicapped for want of necessary legislation, and the proposed organization will fill a long-felt want in this province. Legislation that was good for cities of 50,000 and more was equally good for cities of 10,000 and over.

The committee to complete the new organization was appointed as follows: J. P. Jaffray, Galt, chairman; W. B. Burgokne, St. Catharines; James P. O'Brien, Fred L. Riggs, Toronto; H. F. Holland, Sarnia; H. L. Hutton, Welland; A. B. Pringle, Preston; C. H. Mueller, Waterloo; Mayor W. H. Schmalz, D. B. Detweiler and H. J. Bowman, Berlin.

Civic Improvement Elsewhere.

C. H. Mitchell, C.E., of Toronto, vice-president of the Toronto Civic Guild, delivered an illustrated address showing views of leading European and United States cities and small towns where town planning and civic improvement have been successful. He stated that the time has arrived in Canada for national and Provincial effort, and for concerted civic activity in each community, to provide for wide and continuous business thoroughfares, convenient grouping of public buildings, rapid transit, adequate street traffic circulation, parks and squares; parkways and boulevards, children's playgrounds and gardens, clean and attractive streets, pure water supply and efficient sewage disposal, enforcement of laws for structural building and fire safety, and for tenement regulation.

Mr. Mitchell suggested that that legislation might include, among other enactments, the following: Provision for civic improvement commissions in smaller cities; provision applicable to cities smaller than already provided for in the Ontario act for purchase by municipalities of land required for opening streets not only sufficient for the streets themselves, but for an adequate margin on each side, which, after the opening has been completed, can be resold as lots, thus producing a revenue to help meet the cost of the improvement; provision for municipalities to secure streets wider than 66 feet in new sub-divisions when necessary to conform to the town-planning scheme; a practical method for any necessary widening of business streets already built up; an adequate control over new sub-divisions so that the layout will conform to modern requirements and so that misrepresentation cannot be practiced; provision for control by the municipality, through the Ontario Railway and Municipal Board, of the layout and street-planning features of sub-divisions outside city and town limits for a stated distance.

Building permits in Winnipeg in 1912 were $20,174,550, as compared with $18,282,250 for 1911.

Stucco for Exteriors

The most durable stucco is obtained when cement is employed, but the trouble lies in the fact that cement sets quickly, much more quickly than lime, and cracks are liable to appear, says The Builder. If, however, just with the accent on the word just sufficient of each ingredient is used, and neither too little nor yet too much water is added, a stucco can be produced that is far superior to any other in weathering powers. If an excess of water is employed the plaster will not cling properly to the wall; yet, on the other hand, if too little be used, the cement plaster will dry so quickly that cracks are certain to result. Again, if too much cement is used cracks are liable to appear. Dryness in any form results in cracks, which in some cases are so fine as not to be discernible except by close inspection. These cracks will in time admit moisture, rain bearing sulphur and ammonia, which will in time break down the protective covering, and the stucco will fall away, either by disintegration or peeling.

One essential, therefore, to good work is that the plaster must not lose its dampness too rapidly, and this can be done by keeping the surface wetted or by way of damp cloths hung in front of the wall. It is also necessary to prevent the water in the cement being absorbed by the brickwork on which it rests, and this can be done by previously well wetting the brickwork.

To make a good weather resistant, the stucco must be dense. This can be obtained by mixing the concrete stiff, and yet contain the necessary water to prevent rapid drying, which will allow the plasterer to work rapidly. A very thorough mixing will accomplish this. Trowelling the surface should not be done too much, for although by this means density is accomplished, the result will only be the trouble of cracks when dry, which is to be avoided. Trowelling brings the water to the surface, and the work is liable to dry too rapidly.

Proportions of Material.

The proportions of the various materials used is debatable. Whether the first or last coat should contain the most cement has to be considered from two points. The first coat, it is argued by some, should be the one containing the greatest percentage of cement, as it has to bind to the wall and support the outer coats. On the other hand, the last coat is the one attacked by the weather, therefore it should have the greater amount of cement is argued by others. Unfortunately, the greater the percentage of cement there is all the more tendency to crack, and unless great care is exercised a high percentage of cement is likely to produce this undesirable result. A medium percentage is therefore the best in the long run. Thus the coats—three are recommended, as two coat work is little more than ½ inch thick—may be composed of one Portland cement to two of clean, sharp sand. This for the first two coats. The finishing coat may be composed of Portland cement, sand, and clean, sharp gravel. As the cement is liable to expand during wetting and contract whilst drying the precautions previously mentioned should be taken. Lime stucco is preferred by some, because it is not liable to this trouble.

The sand and gravel must be sharp. Many a failure is due to the non-observance of this. Earthly matter or organic substances not only chemically combine with the cement and break down the stucco, but they prevent the cement from mechanically joining with the sand and shingle.

The first coat should be well scored to form a proper juncture with the second. The wall, too, should be properly prepared, well washed, and joints raked out if necessary. If the wall is old and has been exposed to the weather it should be washed down with a weak acid, as, for instance, muriatic acid. This should be done several days before the stucco is applied.

Uneven thickness of plastering should be avoided or cracks will result through uneven drying. Joints should therefore be filled in before the general coat is applied.

Where furring strips are used for the purpose of affixing metal mesh precautions must be taken to prevent danger from them. This arises from the fact that they are liable to split under the influence of wetting and drying at those places where staples have been driven in to fix the metal mesh, and, the mesh becoming loose, the stucco and mesh fall down. By attaching the mesh to the wood strips by galvanized iron wire tied around both this danger is avoided.

A good lap should be given to the mesh joints, or at these places cracks in the stucco will appear. There is a danger in using metal lath where some patent plasters are used, as some of them contain acid, which attacks the metal. It is desirable, therefore, where such are used to give the mesh a coat of limewash or some similar protective coating.

Where lime is used with cement the limit should be 10 pounds of hydrated lime, to one bag of cement, and this should only be used for the second coat. The first and last coats should not contain more than 5 pounds per bag of cement; in fact, it were better to use none at all in the finishing coat. Only hydrated lime should be used, and no plasterer's putty. Hydrated lime is lime scientifically prepared, being properly cleansed and screened, and is free from all impurities. A good substitute for sand is asbestos rock and fibre. The fibre performs the binding function of ox-hair in plastering, the stucco being less liable to crack. The use of asbestos fibre along with cement and sand can be recommended. Other aggregates, such as crushed marble, finely crushed granite, and similar rocks are used where some special finish is desired.

To Obtain a Rough Cast.

To obtain a rough-cast finish, mix one part hydrated lime with two of Portland cement, mixed dry, and add water until a thick paste is obtained. Put this into a pail, and, keeping it well mixed, take out by means of a paddle or trowel, which, dashed against a stick held in the other hand, splashed the mixture on to the wall, giving the rough-cast finish.

Pebble dashing is composed of clean-washed pebbles mixed with a thick paste of the composition above. This gives a pebbly surface to the work. To obliterate any streaks showing after the finishing coat has been put on, a lime-cement wash can be used, which at the same time will fill in any cracks. To obtain a float finish, the surface is treated with a hand float in the ordinary way for plastering.

Coloring Brick

Brick owes its color to the presence of iron in the clay from which it is formed. Usually 5 or 6 per cent. of oxide of iron (ferric oxide) will give a deep red color to brick, a higher percentage of carbonates of lime and of magnesium will modify the color.

The Canadian Builder
and Carpenter

A Practical Paper Devoted to all Branches of the Building Trades

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Read and Study in Winter

One of the problems of builders and carpenters, is to keep busy during the winter months. In this issue is an article giving a few ideas for keeping the money coming in during that part of the year when all building operations are practically at a standstill in Canada. One idea strikes us forcibly and that is **The builder and carpenter should plan for the coming season**. It is an excellent time to become more familiar with the trade, to read books on subjects that will help him in his work and study his technical papers. As one writer in the American Carpenter & Builder puts it:—

"Some may not think that, by reading magazines and books, there will be any good derived therefrom—every person knows some other man knows some things he does not; and how are we to learn if we do not read?

"I've not been at the trade very long but have found that by reading an hour I learn more than I can do in twice the same length of time—for instance, I take my building paper, every issue is all new and will never get old and stale. First we will take the house plans, they are good and very reliable, you can't question that, and in every plan you get a goodly bunch of ideas you can readily give your customers, because they are correct, up to date, simple, neat and as substantial as are wanted by anyone, and a host of more things to learn from that one plan of a modern residence.

"There is a school, over further in the book, a plain, modest, roomy structure. There you get the best ideas on ventilation, light and sanitary equipment that an expert can give—that will be several dollars to you after a while.

"Then we read of a church; you see the floor plan; you study it; you learn from another expert how to build from his plan or make one of your own for your customers and will not be afraid of the job because you learned from men who know; maybe a pocketful of dollars here.

"Now we find a garage. Have you ever erected one? If not, how are you going about it? Why you have several plans in the building journal that just tickle your customer."

The first-class builder and carpenter takes some time for study during the winter months. It helps him when the building season opens for then when he meets with a problem he knows how to solve it.

Take the steel square. How many readers know all about the steel square? By studing books on the steel square you can learn many short cuts that will save hours and days of the precious summer time. We recognize the value of the steel square and are publishing in each issue of The Canadian Builder, methods of using it.

The progressive builder of to-day keeps in close touch with up-to-date ideas by spending some spare time reading books and papers on building.

Canada's Fire Loss Should be Lessened

Statistics show that Canada's per capita fire loss is the highest in the world and about 1,000 per cent. greater per capita than in Europe. This loss is borne by the people paying insurance and not by the insurance companies. The following comments should be convincing, and if a movement is undertaken to form a National Fire Protective Association, it should receive the support of manufacturers generally.

The fire loss of the United States and Canada during the month of October, as compiled by the Journal of Commerce, shows an aggregate of $13,651,650, as compared with $13,945,000 for the same month of 1911, and with $37,188,300 in October, 1910, when climatic conditions resulted in serious losses from forest fires. The losses for the first ten months of 1912 reach the sum of $191,181,600, as against $192,933,800 for the same time in 1911.

	1910	1911	1912
January	$15,175,400	$21,922,450	$35,653,450
February	15,489,350	16,415,000	28,601,650
March	18,465,500	31,569,800	16,650,850
April	18,091,800	17,670,550	16,349,400
May	18,823,200	21,422,000	21,013,950
June	13,183,600	20,691,950	16,103,450
July	26,847,900	25,301,150	15,219,100
August	21,570,550	12,662,650	14,158,800
September	11,700,000	11,333,250	13,779,300
October	37,188,300	13,945,000	13,651,650
Total, for 10 months.	$196,535,600	$192,933,800	$191,181,600
November	16,407,000	18,680,600	.....
December	21,528,000	22,722,850	.....
Total year	$234,470,600	$234,337,250	.....

The yearly fire loss in Canada amounts to nearly $25,000,000 yearly. This means that Canada has the heaviest per capita fire loss of any country in the world, the annual average in the Dominion being $3.07, as compared with $3 in the United States and .33 cents in Europe. This was pointed out by Mr. Franklin H. Wentworth, secretary of the National Fire Protection Association of the United States, in a recent address to the Canadian Manufacturers' Association, the Board of Trade, the Canadian Credit Men's Association, the Insurance Institute of Toronto, and the various ratepayers' associations, members of which were present to the number of five hundred.

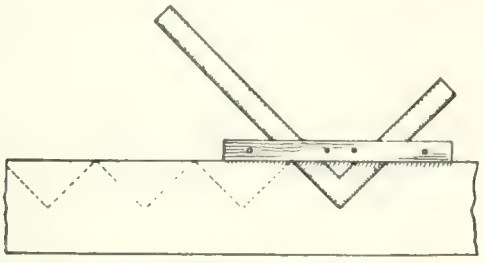
The National Fire Protection Association discovered that 60 per cent. of the fires could be traced to some special cause, some specific incident which could have been avoided. Automatic sprinklers prove very effective; the construction of closed stairways, elevator shafts and belt towers are becoming more general. Records of the National Fire Protection Association show that ten thousand fires being extinguished, and they had yet to hear of the failure of an automatic sprinkler.

Carpentry and Woodworking

Laying Out Stair Strings With a Square

By C. Elmer Bochmer

In laying out stair strings I find that time will be saved if I attach two $\frac{7}{8}$-in. strips of wood, one on each side of the square, as shown in the sketch, so as to



Laying out stair strings with a Square.

obtain the desired rise and run. All treads can be quickly and accurately marked with this device. Popular Mechanics.

Building a Small Greenhouse

In a recent issue of American Homes and Gardens, Philip S. Sweetser describes the manner in which the building of the greenhouse may be done.

There are three general types of greenhouses, namely, the lean-to, the even-span, and the three quarter-span house. There are other types, such as side-hill, ridge and furrow, and curvilinear houses, but these are simply modifications or combinations of the three general types. The details of construction are practically the same in all three types. They differ only in the form of construction.

The "Lean-to."

The simplest type is the "lean-to." From the nature of its construction this type of house can be built at a comparatively low cost. As its name indicates, it is built against some structure and therefore requires but three sides and a one-slope roof. It is usually a small house and when heated is generally connected with the heating apparatus in the building to which it is attached. It should, when possible, face the south and, due to its peculiar construction, receives no reflected light whatever from the north.

The Even-Span House.

The even-span house is the type most commonly used by florists. It can be built at a cost of $8 to $25 per running foot, depending on its width and the amount of labor figured in. It is a perfectly symmetrical house, the ridge being in the center of the roof span, the roof slopes being the same, and the sides being of the same height. It is an all-glass house and is constructed of widths varying from 8 to 42 feet. The width of the average commercial house is about 24 feet. This type of house usually faces the south—that is, its ridge runs east and west.

The Three-Quarter-Span House.

The three-quarter-span house, two-thirds, or uneven span, as it is sometimes called, costs about the same as the even span. It is designed for a more even distribution of light over the benches than it is possible to secure with the even span, and it differs from it in the construction of the roof and the north wall, and frequently in the arrangement of the benches. The ridge, instead of being placed in the centre of the roof span, as in the even-span house, is placed near enough to the north wall so that its shadow does not fall on the benches. The north wall is constructed two or three feet higher, in this type, than the south wall and is generally built of wood or concrete up to within one or two feet of the eaves. The benches, in order to receive the maximum amount of light, are then arranged in tiers.

This type of house, of course, must face the south, and, due to the fact that the plants receive the maximum amount of light evenly distributed, a structure of this sort is often spoken of as a "forcing house."

Foundation.

The foundation should be made of concrete. A good

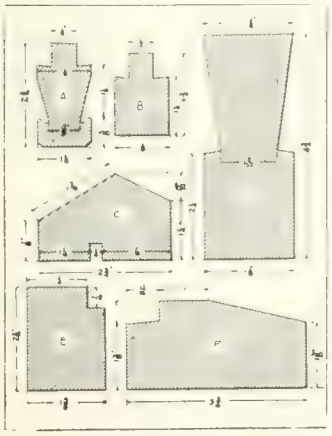


Fig. 1.—Diagrams showing dimensions of bars.

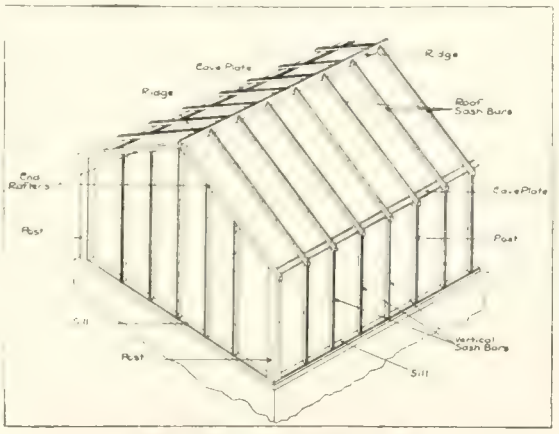


Fig. 2.—Framework of timbers.

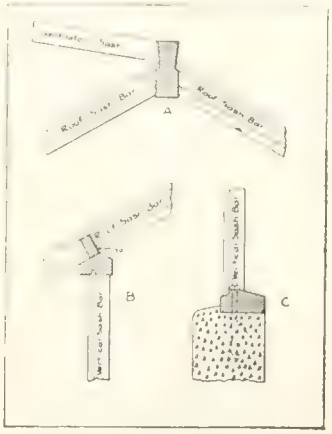


Fig. 3.—Details of framing.

concrete will be obtained by mixing one part cement with two parts sand and five parts of gravel or broken stone. After the mixture is saturated with water, it should be placed in forms, built of seven-eighths inch or one-inch boards, rammed, and allowed to set at least 24 hours. Square-headed bolts, six or eight inches long, should be embedded about six feet apart in the concrete before it has set, for the purpose of holding the sills firmly in place. After the concrete has set and the sills have been put in place the foundation may then be capped with a thin mixture of cement mortar, made of one part cement and two parts sand. The cost of materials varies from $2.50 to $4.00 per cubic yard of concrete, depending on the kind and prices of the ingredients used. A cubic yard of concrete made of the proportions given above will contain 1.29 barrels of cement, 0.45 cubic yards of sand and 0.91 cubic yards of gravel or broken stone. By obtaining the local price of cement, sand and gravel, the cost of the foundation can easily be estimated.

Framework.

The framework is simply a skeleton composed of timbers called sills, posts, vertical sash bars, eave-plates, roof sash bars, rafters and ridge. These timbers should be made of cypress, for, on account of its straight grain, strength and durability, this has been found to be the wood best adapted for greenhouse construction. They should be made of such shapes and sizes and put together in such a manner that they will properly hold the glass, support their required weights and yet cast the least possible amount of shade. Fig. 1 shows the proper shapes and minimum dimensions (A, roof sash bar; B, vertical sash bar; C, eave plate; D, ridge; E, end rafter; F, sill) which have been determined by greenhouse carpenters after years of experience.

The method of framing the eaves is shown in detail at B, Fig. 3. The sash bars simply rest on the wide face of the eave plate and the space between the eave plate and the glass is filled in with a piece of seven-eighths inch board as shown at A.

Glass.

The glass used should be "double thick" and of the second or third quality. Third quality glass, which contains a few more imperfections than second quality, costs a little less and is frequently very satisfactory. The panes may be 16 x 20 in., for these have been found to be economical sizes, and they should be set so that the sash bars are spaced 16½ in. on centers. The cost of this size glass at the present time is $2.28 per box (of 23 panes) for third quality and $2.50 for second quality.

Paint for Shingles

By A. Ashmun Kelly in "The National Builder"

Paint is sometimes required for shingle coating, but if I had to decide the matter it would be in the words of Punch: Don't! Paint is probably the worst coating one could apply to shingles. It is all right so far as the exposed parts are concerned; it is in the cracks between that the trouble comes, for there the paint will form little dams and hold water, which in time will rot the wood. Still, as stated, paint will be used, and hence a word as to its character and application. Let it be of a good mineral pigment, mixed with pure raw linseed oil only, with a little japan driers. Mix it quite thin—a mere priming coat—and the damming of the cracks will be greatly lessened, if not entirely avoided. It is best to use pigments that are ground in oil, for the dry pigment is too coarse for this purpose. Nor should a ready mixed paint be used, for it will likely be unfitted for this particular purpose. After mixing the paint, strain it through a fine wire sieve, which will remove any foreign particles and make the mass more perfectly incorporated. To mix it, add a little oil to the pigment at first, and work it into a smooth paste, gradually adding more oil until the mass is quite soft, and then it may be further thinned for application. The use of driers should be carefully done, as excess of this liquid will tend to injure the paint, so that it will not wear as well. Paint on shingles is in a position to suffer a great deal more from the weather and sun than where used on the sides of houses. Therefore, see that it is of the best quality and carefully mixed. Many times it will not require any driers, as in summer, in dry weather.

Shingles may be dipped in paint, just as with shingle stain, by making the paint very thin, and adding some benzine to the mixture, which will thin out the paint and make it more penetrative, while not affecting the paint, as it evaporates and leaves the oil as it was. Place the thin paint in a tub or half-barrel and tack a strip across, and as you dip the shingle draw it against the strip, which will remove excess of paint. The advantage of dipping is in the fact that all parts of the shingle are protected, and when the shingles warp apart, under the influence of the sun and wind, there will be no raw places to show through, and which unpainted parts detract very much from the appearance of a job of this kind. After the shingles have been dipped and laid they will be greatly benefited and enhanced in beauty by the application of a brush coat of the same paint-stain.

When dipping shingles throw them loosely in a pile, to dry out. It is not necessary to dip more than two-thirds the length of the shingle, or far enough to cover what is likely to show. Some remove the excess paint with a bristle paint brush.

The pigments used for shingle painting should be not only very finely ground, but transparent also. Such colors as raw and burnt sienna, raw and burnt umber, chrome green, chrome yellow, Prussian blue and drop black are useful pigments. These colors may be used alone, or in compounds, according to the color you wish. Thus umber makes a walnut shade, as does also Vandyke brown, only darker; raw sienna makes an oak color; burnt sienna makes a cherry color; a light pigment may be toned down with black or umber or Vandyke brown; Vandyke brown may be imitated by mixing together burnt umber and black. Raw sienna and a little burnt umber will give a dark oak color. Chrome yellow will lighten up chrome green, and black will tone it down. Zinc white should be used when a white is desired, because it is non-poisonous, a matter to be considered when the water is to be used for culinary purposes; sometimes the water from the roof is caught in a cistern and used. In such a case do not use any of the lead colors, such as chrome yellow, chrome green, or white lead. The earth colors, sienna, umber, Vandyke brown, and also drop, ivory and lamp-black, are perfectly safe colors to use.

Colors may be blended on the roof after painting by applying two or more colors in bands like, and softly blending them with the brush. This makes some very pretty color effects, and takes very little more time. For this purpose use the paint slightly thicker.

Concrete Department

Model Houses for Workingmen

In a recent issue of the Scientific American an article deals with the question "Concrete Houses versus Tenements" for workingmen. Some interesting data is given on the cost of medium priced houses. The American Sheet and Tinplate Co., Gary, Ind., have completed fourteen buildings costing $130,000, furnishing apartments for seventy-four families. This is the beginning of a plan to house 250 to 350 families. This company and the United States Steel Corporation have built homes for workingmen with the idea of selling them to the tenents at a figure at which they can buy them on a monthly payment basis.

A single dwelling in a terrace is estimated to cost $1,803, and a detached house $2,750. The present investment of the tinplate company stands at close to $200,000 for equipment, forms, materials and labor. Its forms cost approximately $40,000, and have been used in the construction of the following houses and apartments:

Six houses at $2,750 each	$16,500
Three ten-apartment houses	49,000
Two ten-apartment house	32,500
Two four-apartment houses	13,000
One three-storey ten-apartment house	22,000
Total cost	$133,000

These buildings are provided with all modern conveniences and sanitary essentials. Mantelpieces and buffets are made of concrete, as well as water pipes, drains and gutters. The detached houses, two stories in height, are provided with shower baths. The floors are of concrete, wood or composition. The roofs are composed of tile or gravel and tar.

The exterior ornamentation also is formed of solid concrete. In fact, every feature of a house which can be built of indestructible material is so constructed. A variety of architecture which is not unpleasant to the eye has been secured, and the settlement is far more attractive than long rows of tenement houses. The "ten-terrace" houses, with accommodations for ten families, are a departure from the set rule of workmen's cottages. They contain seven rooms, four on the first floor and three on the second. In the three-storey terrace houses, each apartment has nine rooms.

Houses of "Poured" Concrete.

The Edison plan for monolithic concrete construction —that of large molds of steel into which the liquid stone is poured—has been improved upon in the newer "sectional" forms used by the tinplate company. These sectional forms and their accessories in the process of "setting up" number 28,000 separate pieces and comprise the equipment for as many as twenty different styles of house, each varying in architecture. The frames or sections are composed of durable sheet steel and constructed with flanges which can be clamped together to form a continuous wall or floor. With the foundation section in place a force of workmen sets each section on top of the previous one until the required height of the first wall has been reached. Each floor becomes a separate entity: in fact, each room is an entity, surrounded completely by concrete reinforced with bars of steel or mesh wire. The interior and exterior surfaces are later smoothed and pointed, then painted, calcimined, plastered, sand-blasted or tinted, according to the plan of the architect, and the artistic effect he desires to produce.

These houses and apartments are built to rent for from $12 and $15 to $25 and $30 a month. They are within walking distance of the company's plant and are placed south of the smoke which comes from the plant. There are about these houses ample yard space, garden plots, fresh air and sunshine. Their occupants are not cooped up on a single floor with no breathing area and no sanitary provisions. They are porches for summer social advantages and play room for the children.

Building Concrete Steps

Prof. John R. Bell, Huntingdon, Pa., gives in the Building Age, details for building seven concrete steps 40 feet long with 6-inch risers and 15-inch treads. Steps placed on the ground in a solid mass are as a rule not reinforced, and I conclude that the specifications do not call for it. Therefore, at least 18 inches to 2 feet of earth should be excavated if the steps are placed against an embankment or terrace. If filled in it should be done to within the same distance from the finished steps. The next operation is to fill in about four inches of broken stone and then cinders to be placed on top of the stone, the cinders to be well sprinkled and tamped to insure compactness.

Perpendicular expansion joints should be cut through the entire mass. In the writer's opinion there should

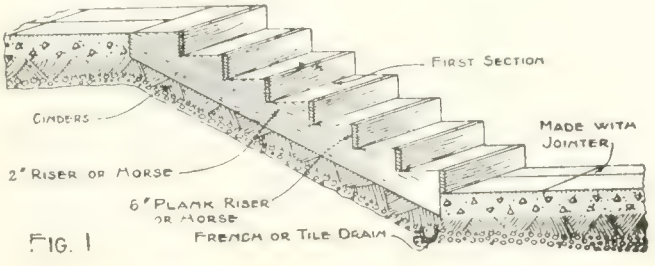


FIG. 1

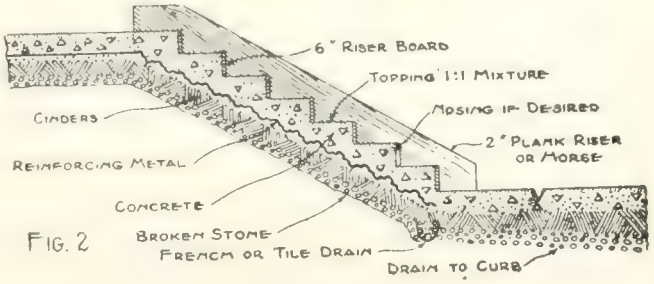


FIG. 2

be at least three of these points dividing the steps in ten-foot sections. This can be accomplished in one of two ways. First by completing the first and third sections and removing the "forms" from the completed sections and then placing the "forms" for the second and fourth sections and completing them. Care must be taken to plaster the forms with top dressing as the concrete is placed in them.

This will be the easier way for the unskilled workman. The "forms" in this method can be placed in the usual way and a sufficient number of risers be used to complete the entire job at one time. These should be placed upside down, nailing the 6-inch riser plank to the riser "form," in some localities called horses, and plaster the top coat on the riser boards or plank as well as on the exposed portions of the finished concrete. I may state also that a tile drain should be provided so that the water will not accumulate at the bottom of the steps. This can be accomplished by filling a trench the entire length of the steps with broken stone and making two such drains at right angles, with the long drain running to the French drain under the curb. These drains will prevent the steps being affected by frost and are necessary if tile is used. The latter should be placed about ten feet from both ends, thus having two drains equally distributed.

Care should be exercised in setting the risers referred to so that the steps will slope sufficiently to allow the water to run off. If reinforcing is desired place two inches of concrete on the cinders and then on this place the wire mesh or reinforcing bars as the case may be, and then fill in the concrete.

I would suggest for this class of work a 1:3:6 mixture for the concrete and a 1:1 mixture for the top dressing.

Winnipeg Builders' Exchange

At the annual meeting of the Winnipeg Builders' Exchange held recently, the financial report of the secretary, A. M. Rose, showed the exchange to be in the most flourishing condition of its history.

The election of officers resulted in the re-election of W. J. Davidson as president; F. Hinds, 1st vice-president; J. McQuarrie, 2nd vice-president; Thos. D. Robinson, treasurer; and the following to the board of directors: W. P. Alsip, J. W. Morley, H. C. McMartin and R. W. Paterson. The board is composed of twelve members, four retiring each year.

The meeting was well attended and many of the members expressed their satisfaction with the splendid condition of the exchange. President W. J. Davidson's report for the year was particularly gratifying and received most flattering references from the different speakers.

When one considers that at least 85 per cent. of the $20,000,000 worth of building in Winnipeg during 1912 was done by members of the exchange, it is readily understood that it is a very important institution in the city.

Toronto Builders' Exchange

At the December 9, 1912, meeting of the Builders' Exchange, Toronto, Mr. Edward A. Roberts, Secretary of the Cleveland Builders' Exchange, gave an interesting and instructive talk on "The Benefits of a Builders' Exchange and the Desk and Exhibit Future." He described the methods adopted to bring about the satisfactory state of affairs existing in that city at the present time. It was the result of concentrated effort. The members of the Cleveland Exchange got acquainted with each other at frequent social and business luncheons at which short talks were given on matters of interest to the building trade. Smoking concerts were also arranged from time to time and one of the events on which he laid particular stress was the annual outing, at which various sports were taken part in. Publicity was another strong feature to be considered. Visits were also arranged for and the party personally conducted through new buildings, before they were opened to the public.

In the Cleveland Exchange desk space can be rented in the building for as low a sum as $30 per annum and exhibit space was rented at very reasonable rates, which gave the Exchange a fair profit. The privileges enjoyed by the members were many. Any message telephoned to a member who happened to be absent, was written upon a specially designed slip and put upon his desk, together with a note of the time the message came in. Bulletins were also published every day, and put upon a notice board, of any contracts which had been awarded, tenders wanted and any information which would be of interest to builders. The officers preferred this method of giving out news rather than that of mailing it to the members as the former course compelled the builder to visit the Exchange. "Get the builders together," was the slogan and reason given by Mr. Roberts.

Canadian National Association of Builders' Exchanges

City.	Secretary and Address.
Montreal	R. L. Werry, Sec., 263 St. James Street.
Toronto	P. L. Fraser, Sec., 2 Berti Street.
Quebec	A. Cote, Sec., 23 Rue St. Jean.
Ottawa	W. Hastings, Sec., 22 Metcalf Street.
London	Geo. S. Gould, Sec., Bank of Nova Scotia Building.
St. Thomas	E. O. Penwarden, Sec., Dowler Block.
Kingston	E. R. Beckwith, C.E., 292 Earl Street.
Sault Ste. Marie	MacPhail & Wright Cons. Co., Limited, P.O. Box 835.
Brantford	A. J. Cromar, Sec., 103½ Dalhousie St., P.O. Box 212.
Windsor	Geo. A. Freeman, 44 Campbell Avenue.
Hamilton	A. Heatley, Sec., 7 East Avenue South.
Stratford	J. L. Young, Contractor.
St. John, N.B.	Chas. F. Stevens, Builders' Exchange.
Halifax, N.S.	H. Roper, care S. M. Brookfield, Limited, 58 Granville Street.
Winnipeg, Man.	A. M. Rose, Sec., Portage Avenue and Hargrave Street.
Regina, Sask.	Geo. Powell, Sec., Builders' Exchange.
Calgary, Alta.	W. W. Hay, Sec., Board of Trade Building.
Edmonton, Alta.	A. O. Wetmore, Sec., McDougall Court.
Medicine Hat, Alta.	J. D. Everard, Sec., Builders' Exchange.
Lethbridge, Alta.	E. Power, Sec., Acadia Block.
Vancouver, B.C.	Builders' Exchange, 342 Pender Street.
Victoria, B.C.	Chancery Chambers.

The West End Realty and Building Company, of Winnipeg, a firm of exclusive house builders, have announced their intention of next spring opening up branches in Edmonton and Regina, and possibly other cities in the West. Their operations in Winnipeg this year have run into close to a million dollars, all in high class residences. They expect in 1913 to spend upwards of $4,000,000, and to make the necessary financial arrangements the manager of the company leaves at the end of this month for France, where much of the capital to be used will be raised, it being understood that the backers of the organization are European capitalists.

Brick Work and Plastering

Comparative Tensile Strengths of Mortar Made With Natural Sea Sand and Four Kinds of Artificial Sand

Artificial sand for mortar is perhaps held by the average builder as inferior to natural sand. There is logic in this preference, the natural material has withstood the decay and attrition of time until most of the weaker materials have disappeared and those which remain stand a large necessity the choicest in strength and hardness. Natural sand, however, unless washed, is less pure than artificial sand, and in other respects it is of less certain standard. Made of stone of comparable character artificial sand is quite as good a material for mortar and in many instances is a better material than natural sand as it ordinarily comes to the work. There are many tests in support of this claim and we summarize here the results of one which was presented at the recent congress of the International Association for Testing Materials by Mr. Gasser of the harbor works at Marsailles, France.

The natural sand tested was a sand resulting from the disintegration of silicious rocks and having regular rounded grains. The test sand was prepared by freeing the natural sand of its biggest particles, of which it contains a relatively small quantity, by passing it either through a sieve of wire gauze having seven meshes per square centimeter, or through sheet metal perforated with holes 5 mm. in diameter.

The artificial sand No. 1 was obtained by crushing a calcareous, nearly pure material. It is sand "just as it comes," produced simply by eliminating pieces having dimensions of more than 0.01 m. after crushing.

The rock utilized for the manufacture of the artificial sand No. 2 contains a considerable portion of clay, which is derived from the strata and their joints.

The sand No. 3 was obtained by crushing a natural mixture of fine silico-calcareous sand and of calcareous pebbles. The grains of the natural sand are round, those of the crushed product angular.

The sand No. 4 was produced by crushing the debris of paving blocks of porphyry.

The mortar was molded into briquettes of standard form for tension tests and into cubes for compression tests. A summary of the results is as follows:

Lime Mortars.—Apart from very rare exceptional cases, the mortars made with crushed sand are superior, and much superior, to the mortars prepared with St. Raphael sand. Sometimes the strengths of the mortars mixed with crushed sand have exceeded the strengths of lime pastes. The tensile strengths of the artificial sand No. 2 have alone in the series manufactured in September, 1905, and June, 1906, sometimes proved a little inferior to the sand from St. Raphael.

Cement Mortars.—In series No. 2 the strengths of the artificial sand No. 2 and sometimes also the strengths of the artificial sand No. 4 are in general smaller than those of the sand from St. Raphael.

In series No. 3 we notice the same fact for the artificial sand No. 2 as regards tensile and crushing strengths.

In series No. 4 the strengths of the artificial sand No. 2 are, in the tensile tests, superior to those of the sand from St. Raphael except in the four years' tests; the strengths of the artificial sand No. 1 are, at the end of four years, inferior to those of the sand from St. Raphael. In the compression tests the crushed sands have always come out better than the sea sand.

Summing up, we find that, as regards both tensile strengths and crushing strength, the strengths of the crushed sands are notably superior to those of the sand from St. Raphael. The exception observed in the fourth series of experiments with respect to the artificial sand No. 1 is no doubt due to some particular circumstance which we do not know. The other exception concerning the artificial sand No. 2 is explained by the presence of rather considerable quantities of clay in this sand.

Measurement of Plastering

The following is a rule followed by builders in calculating number of yards of plastering: Plastering on plain surfaces, such as walls and ceilings, is always measured by the square yard; but there are considerable variations in detail in the methods of measurement in different parts of the country. The following rules, however, probably represent the average practice, and are equitable to both parties concerned:

On walls and ceilings, measure the surface actually plastered, making no deduction for grounds or for openings of less extent than 7 superficial yards. Returns of chimney breasts, pilasters, and all strips of plastering less than 12 inches in width, measure 12 inches wide. In closets, add one-half to the actual measurement; if shelves are put up before plastering, charge double measurement. For raking ceilings or soéts of stairs, add one-half to measurement; for circular or elliptical work, charge two prices, for surface of domes or groined ceilings, charge three prices. Round corners and arrises (other than chimney breasts) should be measured by the lineal foot. On interior work, increase the price 5 per cent. for each 12 feet above the ground after the first. For outside work, add 1 per cent. for each foot above the lower 20 feet. All repairing and patching should be done at agreed prices.

Paristone Wall Plaster

Paristone is a prepared wall plaster manufactured by the Alabastine Co., Paris, Ont. A booklet issued by the company gives full directions for its use and some interesting information. Sand and Paristone, two to one, are mixed before adding water, and added to laths in the ordinary way. It may also be used on brick or for second coat on lath walls.

Producing Marble Effects With Paint

By W. G. Browning

Prepare the colors to be shown in the marble, using varnish for the vehicle and japan colors, reduced in turpentine, making glaze colors or varnish stains. Put in the ground color with lead and turpentine and allow it to dry, then apply different glaze colors so as to give a mottled, variegated effect. No care need to be taken for this part of the work, as the crudest efforts give the best results.

Dissolve a lump of potash the size of a pea in 1 oz. of kerosene, and while the glaze coat is fresh, dash small drops of this on the painted surface. This will separate the colors and blend them into very pretty marble effects.

By the exercise of a little taste and ingenuity surprising effects can be obtained. If spar varnish is used, it can be rubbed down and a coat of clear spar put on as a protector.

I have in my yard a pair of large garden urns made of plaster-of-paris marbleized to a malachite green, and these have stood the weather for four years.—Popular Mechanics.

Artificial Marble

The artificial, or stucco, marble is in the main part composed of gypsum, which should be hard, so that the product can be smoothed and polished. To the finely powdered and sieved burnt gypsum marble dust is often added and the mixture gauged with water in which mucilage has been dissolved. The colors and the streaks or veins, the able imitation of which is the main object in the manufacture of artificial marble, are added to the dry mixture, as mineral colors, or during the hardening of the finished product upon its surface by aid of chemical compositions.

To obtain streaked slabs large balls of gypsum are kneaded with smaller ones of different colors, and from the ball so obtained thin slabs are cut, which are laid upon the still damp base and then subjected to high pressure. After hardening the slabs are planed. To avoid this toilsome operation of planing, a sheet of glass, highly polished and rubbed with oil, is used. Colored lines representing the veins are traced upon this sheet; then a ¾-inch layer of a thick mixture of gypsum of the desired color is carefully poured over the glass and left to harden. After hardening the slab is carefully removed, and the surface next to the glass will be found to be absolutely smooth, and need no planing.—Scientific American.

Pudlo

A catalogue from W. H. Thornhill & Co., 160 Princess St., Winnipeg, describes Pudlo, a powder for making concrete waterproof. The word is coined from Puddle meaning "to make watertight by means of clay." Pudlo is a fine white powder. When Pudlo is mixed with neat cement in varying proportion, according to the purpose for which it is required, the claim is made that it prevents dampness and moisture penetrating, prevents leakages, makes cellars and basements damp-resistant, prevents dampness rising in concrete floors, makes reinforced concrete damp-proof and allows flat roofing to be done in cement. The catalogue explains in detail the use and application of Pudlo for builders and architects.

Residence of W. F. Cockshutt, Brantford, showing the iron gate and fence supplied by the Dennis Wire & Iron Works Co., London.

New Equipment

Quick Action Drilling Machine for Stone, Brick or Cement

For reproducing the same action in the drilling of holes in stone, brick or cement as is secured with the ordinary hand hammer and drill, the Diamond Expansion Bolt Company, 90 West Street, New York City, has developed a new tool which is known as the Diamond rapid fire drilling machine. The speed of operation is much greater, however, as with every revolution of the crank at least eight sharp blows are struck. The action of the hammer upon the drill and in turn that of the latter upon the stone is identical with that produced in the old way, but it is emphasized that the best results were secured by comparatively light blows properly timed and struck and this theory has been taken advantage of in designing the new tool. As the number of blows struck varies from eight to twenty times that regularly delivered with an ordinary hand hammer according to the speed of rotation of the crank, a corresponding increase in the rapidity with which the holes are drilled is secured. It is claimed for the holes drilled with this machine that the bore is smooth and the edge is sharp, while danger of cracking the wall at the surface is done away with.

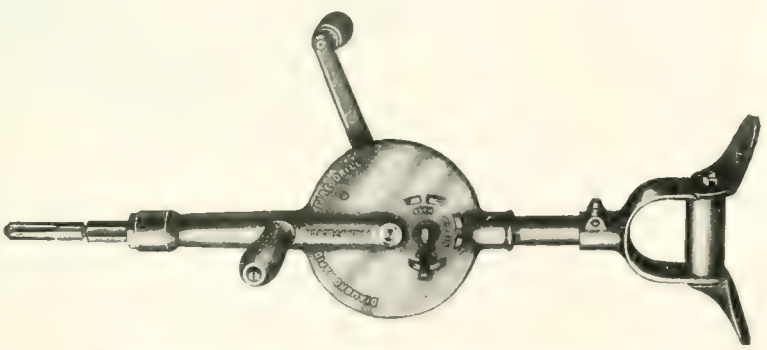
The action of the tool is percussive, and it is claimed that the mechanism is so constructed that practically no vibration or concussion is felt by the operator.

Another advantage is that the handles are so arranged that the tool can be adapted for use in any position. By loosening a screw underneath the D handle, it is allowed to rotate and may be used as a breast plate, thus permitting the drill to be rotated in the hole to insure clearance. When used in this position the forward handle is turned slowly backward and forward to give movement through an arc of about 45 deg., and thus prevent the drill point from binding in the stone.

Standard drill points which are the same as those formerly supplied with the company's drill holder and points are used, and as the taper shanks on all sizes are identical it is possible to use them interchangeably. It is pointed out that the drill points used will remain sharp for a somewhat longer period of time than they would if held in a drill holder and subjected to the blows of a regular stone hammer.

There are three adjustments for the machine, which are controlled by a spring lever at the side of the housing. Two springs of different power are furnished with each machine, thus giving six variations to the

Operating the drill on a vertical wall.



A new type of drilling machine for brickwork, operating on the hammer principle. Built by the Diamond Expansion Company, New York City.

force of the blow that can be delivered by the hammer. By removing the cover of the housing it is possible to change the springs easily without disarranging or unfastening any of the parts of the mechanism.

Paint for Use in Outside Painting

By F. Sturgeon, of Sturgeons, Limited

The following facts need but little comment. Paint is used as a protection to the surface to which it is applied, also for its color effect. The ingredients and their respective values are as follows:—

The oil employed is really the most important material, for it is to this that one must look for the life of a paint. In ordinary paint the purest linseed oil should be used, as this is one of the few oils that in

Two Houses on Carlaw Ave., Toronto, 8 rooms and sunrooms at back, shingle roofs, treated as follows: House on left, shingles, eaves of gable and roof stained with Solignum, all paint work with Paripan (3 coat work), interior hardwood filled and varnished, other woodwork painted with same enamel. The owner states that the cost of material was $32.50, labor run into $55. Referring to the house on the right, the shingles were not stained, cost of material was given by the writer of the article, $45, and labor about $60. The difference in cost was due to use of Paripan on the outside.

drying absorbs oxygen from the air and forms a tough film on the surface to which it is applied.

In enamels used for exterior use, several very much finer oils are employed and one of the finest is China wood oil. This, under special treatment, gives an absolutely water and weather resisting material. However, this is an oil which is not generally used by the painter, and it is only used by a few manufacturers of very high grade English enamels.

Turpentine or benzine are used chiefly to reduce the oil and make the paint work more easily, as well as assisting the drying. The former is recommended because it has certain oxidizing and binding properties, whereas benzine evaporates completely. The pigment used up to recently was white lead, but this is giving way to zinc products.

The following are a few facts which will be of service in considering the respective merits of the two pigments: White lead is obtained by the corrosion of the ordinary lead metal. This gives a flakey white substance, which is ground in water and sold as dry white lead, or more generally it is sold ground in oil ready for use. The chief objections to its use are that it discolors quickly when exposed to sulphurous gases, and this is particularly noticed in a town. It is also apt to decompose and powder off, especially if not prepared properly, and one of the most important reasons is that it is extremely poisonous, and for this reason its use has been forbidden in France, and the governments of various countries, including Great Britain and the United States, are considering the advisability of prohibiting its use.

In some government departments they are exclusively using zinc products. Now if governments are considering legislation to do away with the use of lead, it is as well for us to consider why, and whether the pigment they are recommending to take its place is an advantage.

On looking into the value of zinc we find its cost is practically the same as lead, but it is non-poisonous, will take more oil in proportion, and therefore covers further. Pigment colors mix more readily and as a result it is generally more easily and satisfactorily handled. It is far whiter and more regular in appearance than lead, and furthermore does not discolor as will lead.

Zinc is obtained by oxidization and is supplied in powder, but it is recommended to buy it ground in oil and prepared ready for use, so that it only needs the addition of oil and turpentine or whatever the manufacturer recommends.

In all my experience I have found the best of painting jobs have been completed with high grade ready mixed paints and enamels, and I would strongly advocate the builder to study the claims put forward by manufacturers of various materials, preferably the high class materials, because when he studies the results he will find that the cost of painting is chiefly in the labor, and it pays to spend $100 in labor in putting on paint value $40, rather than putting on material at $30. "Cheap paint is dear at any price."

Some time ago a builder who had been giving contracts for painting to a cheap man, complained that he had built a house and did not sell for three months, by which time the paint was so bad he had to re-paint the whole outside. He is now using the finest paint he can buy. He considers it an economy and the best advertisement.

Manufacturers of to-day supply all requirements. If you need a paint to cost in the neighborhood of $2.00 per gallon, you will probably get good value for it, but at from $4.00 to $6.00 you will get a corresponding increase in actual value. One well known firm shows an interesting comparison of their goods with an ordinary white lead paint which is interesting, and I will therefore quote it. They state their material will wear many

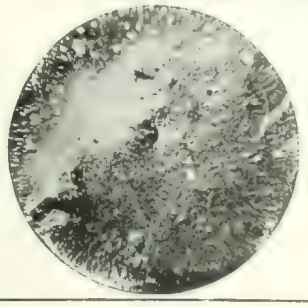
This is a reproduction of the surface of an English enamel, Paripan, magnified 55 times

times longer than paint but if it was only slightly better than white lead the difference in cost would only be trifling.

Comparison is given as follows: To cover 1,500 square feet with lead paint, three coats, you would require 10 gallons of paint, which would cost, at $2.50 per gallon, $25, because on an average paint will not cover more than 450 sq. ft. to the gallon. To cover 1,500 sq. ft. with this other material 70 lbs. of the undercoat would be required.

A preparation of zinc, say at 20c. per lb., $14.00; oil and turps to reduce same, $1.50; 2 gallons of the finishing coat of lacquer enamel, any color, at $5.50 per gallon, $11.00. Therefore cost would be $25 for paint, against $26.50 this other material.

Business is built up on reputation, and it is essential



This is a reproduction of the surface of a good white lead paint magnified 20 times.

it should be so. I strongly advocate all buyers of paints or other materials to consult manufacturers on the requirements instead of taking the first thing offered. Find the manufacturer with a reputation. Make him live up to it. You will then be sure of getting a good outside oil paint—that retains its gloss, its color, and will not peel off.

Bishopric Wall Board

The Bishopric Wall Board Co., Ottawa, Ont., manufacture wall board in 4 x 4 ft. sizes, the construction and use being fully described in a catalogue of 24 pages. A sample received shows it to be cardboard stiffened with dressed lath and both imbedded in asphalt. The smooth cardboard side will take wall paper, burlap or paint, the sheets being nailed to the studding. The catalogue contains some very interesting information showing its use for various buildings and purposes.

Seventh Annual Convention, C.N.A.B.E.

The seventh annual convention of the Canadian National Association of Builders' Exchanges will be held in Calgary Tuesday, Wednesday and Thursday, February 18-20, 1913.

Montreal Builders' Exchange Nominations

The annual meeting of the Builders' Exchange and the election of the officers for 1913 will be held on January 13. The nominations announced by the nominating committee are as follows: President, Mr. Joseph Brunet; first vice-president, Thomas Gilday; second vice-president, Frank Pauxe; directors, John Allan, representing the general contractors; E. Richardson, the roofers, Kennedy Stinson, the builders' supply dealers, P. S. McKergow, the brick and tile interests, J. B. Gratton, the carpenters, John Quinlan, the stone and mason interests, Wm. Rutherford, the lumber and milling interests; and W. E. Potter, who will represent the master painters. The plumbers and the electricians will appoint their representatives later.

Correspondence and Discussions

Readers are invited to send replies to questions asked by readers of The Canadian Builder and these will be paid for at regular editorial rates. Anyone desiring the names of firms manufacturing certain lines will be answered in this department.

Comments on articles published in The Canadian Builder are welcomed and all letters containing good ideas will be paid for.—Editor.

Using Concrete in Winter.

We are up against it every winter with using concrete in winter, consequently any information on the latest methods for using concrete in freezing weather would be welcome. Will you kindly put me in touch with an authority on the subject.—Subscriber.

We would be glad to receive the experiences of our readers on this subject.—Editor.

* * *

A Question of Duty.

(1) What constitutes dimension lumber as meant in the Supreme Court decision on the Foss Lumber Company's appeal?

(2) When was the Supreme Court decision rendered?

(3) Does Douglas Fir joist thicknessed on a planer and brought to dimension on a planer, comply with the Supreme Court as being dimension lumber dressed one side.—Subscriber.

Will a subscriber familiar with this case send us information on these points.—Editor.

Mr. Samuel Y. Dingee, New Manager of Disston's Toronto Factory

Henry Disston & Sons, Philadelphia, Pa., the well-known manufacturers of saws, have made a change in the management of their branch office and factory at Toronto, Ont., by appointing Mr. Samuel Y. Dingee to the position of manager of this important branch. Mr. Dingee has been in the employ of the company for 32 years, having entered in October, 1880, at the age of

Mr. Samuel Y. Dingee
New Manager of Disston's Toronto Factory.

15, when he was employed in a minor capacity. Since that time he has gradually advanced into more important and responsible positions.

Mr. Dingee's business education has been all in the line of the manufacture and use of saws used in the manufacture of lumber. He has had exceptional op-

Price List of Building Materials—Revised to Date

	PRICE AT MONTREAL	PRICE AT TORONTO	PRICE AT WINNIPEG	PRICE AT VANCOUVER
Hemlock Lumber				
2 x 4 in. to 2 x 12 in., 8 to 14 ft.	$20.00	$23.00	$29.00	
2 x 4 in. to 2 x 12 in., 16 ft.	22.00	24.00	29.00	
2 x 4 in. to 2 x 12 in., 18 ft.		26.00	29.00	
1 in. Hemlock No. 1	20.00	21.00 to 24.00		
No. 1 hemlock decking	23.00	24.00		
No. 2 hemlock dimension and 1 in.		16.00 to 18.00		
Pine				
1 in. common pine, 8 to 12 in. wide, rough	$27.00 to 30.00	$27.00 to 30.00		
2 in. white pine, bill stock	29.00 to 33.00	29.00 to 33.00		
⅞ x 8 and 10 in. pine shelving	36.00 to 40.00	36.00 to 40.00		
⅞ x 12 pine shelving	42.00	45.00		
No. 1 white pine flooring	40.00	32.00		
No. 1 spruce flooring	30.00	26.00		
No. 1 pine decking, D2S	40.00	30.00		
Spruce pine decking		25.00		
No. 1 pine V. or beaded sheeting	37.00	35.00		
No. 2 pine V. or beaded sheeting	31.00	31.00		
Pine Trim for Paint Finish				
4 in. casing, per 100 ft.	$2.00	$2.00		
5 in. casing, per 100 ft.	2.00	2.25		
8 in. pine base, per 100 ft.	3.50	3.25		
10 in. pine base, per 100 ft.	4.25	4.25		
4 in. pine window stool, per 100 ft.	2.75	2.75		
Shingles, Lath Roofing, Etc.				
XXX B. C. cedar shingles		$3.60 per M	$4.00 & 3.50 per M	$2.20 & 2.10 per M
N. B. Extras		3.50		
N. B. Clears		2.90		
No. 1 pine lath	5.00	4.75 per M	5.75 per M	2.25 per M
No 2 pine lath	4.50	4.25		
No. 1 spruce lath	4.00	4.00		
Metal lath			.15 to .19	
Roofing Felt (2 ply)			2.50 per roll	
Cedar Posts—Fence				
5 in. at small end	5c. foot	.25 each		
7 in. at small end	7c. foot	.35 each		
Hardware				
Nails, wire, common	$2.35 base keg	$2.40 cwt.	$3.70 per keg	$3.25 per keg
Nails, cut, common	2.55 " "	2.75	3.70	4.25
Sash weights, cast iron	1.50 per 100 lbs.	1.65		
Tarred felt paper	.40 roll	.45 roll	.90 per roll	.90 per roll
Building paper	.30 roll		.75	.70
Insulating paper			1.25	
Brick, Tile, Terra Cotta, Sewer Pipe				
No. 1 dry pressed red brick	19.50	$18.00 per M	$25.00 to 50.00	$45.00 per M
No. 1 dry pressed buff bricks	20.50	18.00	25.00 to 50.00	45.00
Red stock bricks	11.00	12.00	13.00	13.00
Grey stock bricks		11.00		
Wire cut bricks for foundation work		11.00		
Porous terra cotta bricks		15.00	$15.00 per M	
No. 1 enamelled bricks, all colors, from		80.00 to 150.00	100.00	
Fire brick	25.00		45.00	45.00
Roofing tile			.15 per ft.	
Sewer pipe, 4 inch	10c. foot		.08½ per ft.	.14 per ft.
Sewer pipe, 6-inch	15c. foot		.16½ per ft.	
Cement, Plaster, Stone, Etc.				
Cement (bags extra)	1.80 bbl.	$1.80 bbl. (1.55 in car lots)	$2.40 per bbl.	$3.00 per bbl.
Sand, for cement or brick work	1.00 ton	1.15 a yard	1.75 a yard	
Lime	12.00	.30 cwt.	.32 per bu.	1.25 per bbl.
Hydrated lime	13.00	10.00 ton	12.00 per ton	4.25 per bbl.
Mortar color	5.00 bbl.	black, 3½; red, 1½	.05 per lb.	
Plaster of paris	2.35	3.10 bbl.	4.00 per bbl.	4.50 per bbl.
Crushed stone, 2 in.	1.50 ton	1.30	2.50 per yard	
Crushed stone, 1 in.	1.60	1.35	2.75	
Crushed stone, ⅜ in.	1.75	1.45	2.75	
Hardwall plaster	$12.50 neat 6.00 sanded ton	$12.00 neat 6.00 sanded	12.00 per ton	14.50 per ton
Gravel	1.85 ton		1.85 per yard	
Hair (plaster)	.03 per lb.	.04 lb.	1.25 per bale	14.50 per ton

NOTE TO READERS. We would be glad to have suggestions from readers as to the extension or modification of this list.

portunities for acquainting himself with the details of the manufacturing end of the business and has thus become well equipped for the management of the Toronto branch.

Sanding Veneered Doors

Veneered doors should be allowed to thoroughly dry before they are sanded, not merely allowed to stand till the glue has set enough to take the stock out of the presses, but until the wood has thoroughly dried out. Of course, in the making of regular panel doors, there is generally a drying out of the stock between the time it is glued and the putting of the door together, but often not enough time is allowed. And when it comes to flush or sanitary, straight-face doors, there is a natural temptation to finish them before the wood has entirely dried out from the gluing. This should be guarded against, for sanding while green may loosen the veneer face and cause subsequent blistering. Also, it is well to sand lightly for the same reason, especially if the face veneer is thin, for the warmth of heavy sanding may soften the glue and cause trouble. The regulation ⅛-inch stock used in some native woods for door work will stand heavier sanding than the thin faces, with less danger also of sanding through the face. For flush doors the three or six-drum sander can be made to do a good finish job if carefully handled, but where there are cross-bars, a good way to dispense with hand sanding, and at the same time have the work free from sand scratches across the grain, is to sand these cross-bars with a belt sander. There are special machines made for this work, and they are worth while where there is any great quantity to be done.—Veneers.

A Perfect Floor Plan

The distribution of the various rooms in a detached dwelling in their relation to exposure and sunlight should receive consideration according to the following facts, says the Bulletin of the Real Estate Board of Brokers:

A western or southwestern exposure is not good for a dining-room, as the afternoon sun heats it unreasonably in summer. The outlook should be preferably to the south or east or to the north as a last resort, but never to the west unless unavoidable.

The living room, which should be bright and cheerful, should face the east. The morning room, drawing-room or reception room, usually little used, can face to the north or west.

The library must be dry, may face the east. The morning room should face east or southeast. Kitchens require cool locations where possible, and the northerly exposure is therefore best.

Bedroom should have the utmost possible amount of sunlight as it is materially conducive to health, and in building the positions of the beds should be indicated on the plans. You should not have them in a direct draft between doors or windows and fireplace, nor should the eyes of the sleeper face the light on awakening, neither should the side of the bed be placed against the wall. Every bedroom should have an open fireplace on a ventilating flue.

Bathrooms and plumbing on different floors should be placed over one another to give direct simple drainage. Ceilings should be from 10 to 11 feet from the floor in the clear, and the windows are often best designed when grouped, as inside wall space is essential.

Windows that are too large and too many make the house hot in summer and cold in winter, but this may be remedied in part by using plate glass.

CLASSIFIED DIRECTORY—A BUYER'S GUIDE FOR BUILDERS IN CANADA

Asbestos.
Asbestos Mfg. Co., Montreal.

Asbestos Goods.
Asbestos Mfg. Co., Montreal.

Alabastine.
Alabastine Co., Paris, Ont.

Automatic Gas-Steam Boilers.
Consumers' Gas Co., Toronto.

Bath Tubs.
Standard Ideal Co., Port Hope, Ont.

Beaded Sheets.
Metal Shingle & Siding Co., Preston, Ont.

Burial Vault Molds.
Ideal Concrete Machinery Co., London, Ont.

Closets.
Standard Ideal Co., Port Hope, Ont.

Ceilings, Metal.
Metal Shingle & Siding Co., Preston, Ont.

Ceilings and Walls, Embossed Steel.
Galt Art Metal Co., Galt, Ont.

Colors for Concrete.
Ideal Concrete Machinery Co., London, Ont.

Concrete Block Machines.
Ideal Concrete Machinery Co., London, Ont.
Wettlaufer Bros., Toronto.

Concrete Brick Machine.
Ideal Concrete Machinery Co., London, Ont.
Wettlaufer Bros., Toronto.

Concrete Sill, Lintel and Dimension Stone Machines.
Ideal Concrete Machinery Co., London, Ont.

Concrete Mixers.
Ideal Concrete Machinery Co., London, Ont.
Wettlaufer Bros., Toronto.

Concrete Tile Machines.
Wettlaufer Bros., Toronto.

Concrete Reinforcements.
Metal Shingle & Siding Co., Preston, Ont.

Construction Companies.
Weber Mfg. Co., West Allis, Wis.

Contractors and Builders.
Weber Mfg. Co., West Allis, Wis.

Cornices, Galvanized or Copper.
Galt Art Metal Co., Galt, Ont.

Corrugated Sheets (Asbestos).
Asbestos Mfg. Co., Montreal.

Corrugated Sheets (Steel).
Galt Art Metal Co., Galt, Ont.
Metal Shingle & Siding Co., Preston, Ont.

Crestings.
Metal Shingle & Siding Co., Preston, Ont.

Curb Stone Machines.
Ideal Concrete Machinery Co., London, Ont.

Cutouts.
Duncan Electrical Co., Montreal.

Daylight Rods.
Consolidated Plate Glass Co., Toronto.

Derricks.
Ideal Concrete Machinery Co., London, Ont.

Doors.
Canada Lumber Co., Toronto.
L. A. DeLaplante, Limited, Toronto.
Georgian Bay Shook Mills, Limited, Midland, Ont.

Door Trimmings.
Metal Shingle & Siding Co., Preston, Ont.

Drill Grinders.
Luther Grinder Mfg. Co., Milwaukee, Wisconsin.

Drinking Fountains.
Standard Ideal Co., Port Hope, Ont.

Eavestrough.
Metal Shingle & Siding Co., Preston, Ont.

Eave-Trough and Conductor-Pipe.
Galt Art Metal Co., Galt, Ont.
Metal Shingle & Siding Co., Preston, Ont.

Electrical Specialties.
Duncan Electrical Co., Montreal.

Expanded Metal.
Galt Art Metal Co., Galt, Ont.

Fences.
George B. Meadows, Toronto.

Finials.
Galt Art Metal Co., Galt, Ont.
Metal Shingle & Siding Co., Preston, Ont.

Fire Escapes.
George B. Meadows, Toronto.

Fireproof Windows.
Galt Art Metal Co., Galt, Ont.
Metal Shingle & Siding Co., Preston, Ont.

Flooring, Hardwood.
Georgian Bay Shook Mills, Midland, Ont.

Floor Scrapers.
Fox Supply Co., Brooklyn, Wis.
Hurley Machine Co., Limited, Toronto.

Forge and Rivet Heaters.
Consumers' Gas Co., Toronto.

Galvanized Chain Pumps.
Metal Shingle & Siding Co., Preston, Ont.

Galvanized Iron Cornices.
Metal Shingle & Siding Co., Preston, Ont.

Galvanized Tanks.
Metal Shingle & Siding Co., Preston, Ont.

Gas Blow Pipes.
Consumers' Gas Co., Toronto.

Gas Engines.
Consumers' Gas Co., Toronto.

Gas Furnaces.
Consumers' Gas Co., Toronto.

Gas Lighting Appliances.
Consumers' Gas Co., Toronto.

Gas Fixtures.
Consumers' Gas Co., Toronto.

Gas Piping.
Consumers' Gas Co., Toronto.

Gas Ranges.
Consumers' Gas Co., Toronto.

Gas Water Heaters.
Consumers' Gas Co., Toronto.

Gates.
George B. Meadows, Toronto.

Glass.
Consolidated Plate Glass Co., Toronto.

Glue Pot Heaters.
Consumers' Gas Co., Toronto.

Granite (Crushed).
Sand & Supplies, Toronto.

Grinders, Tool.
Luther Grinder Mfg. Co., Milwaukee, Wisconsin.

Hammers.
Double Claw Hammer Co., Brooklyn, N.Y.
Lewis Bros., Montreal.

Hand Scrapers.
Fox Supply Co., Brooklyn, Wis.

Hardware.
Weber Mfg. Co., West Allis, Wis.

Herringbone Lath.
Metal Shingle & Siding Co., Preston, Ont.

Hoists.
Wettlaufer Bros., Toronto.

Incinerators.
Standard Ideal Co., Port Hope, Ont.

Interior House Finish.
L. A. DeLaplante, Limited, Toronto.
Georgian Bay Shook Mills, Midland, Ont.

Lath.
Galt Art Metal Co., Galt, Ont.

Laundry Tubs.
Standard Ideal Co., Port Hope, Ont.

Lumber
Canada Lumber Co., Toronto.

Metal Roofing and Siding.
Galt Art Metal Co., Galt, Ont.

Mortar Gauges.
Ideal Concrete Machinery Co., London, Ont.

Mouldings.
L. A. DeLaplante, Limited, Toronto.
Georgian Bay Shook Mills, Limited, Midland, Ont.

Ornamental Iron Work.
George B. Meadows, Toronto.

Ornamental Molds.
Ideal Concrete Machinery Co., London, Ont.

Plaster.
Alabastine Co., Limited, Toronto.

Plaster Corner Bead.
Metal Shingle & Siding Co., Preston, Ont.

Plaster Paris.
Alabastine Co., Paris, Ont.

Plumbing Goods.
Standard Ideal Co., Limited, Port Hope.

Pulpstone.
Alabastine Co., Paris, Ont.

Pumps.
Wettlaufer Bros., Toronto.

Railings.
George B. Meadows, Toronto.

Receptacles (Electrical).
Duncan Electrical Co., Montreal.

Ridge, Galvanized.
Metal Shingle & Siding Co., Preston, Ont.

Ridgings.
Metal Shingle & Siding Co., Preston, Ont.

Roofing.
Asbestos Mfg. Co., Montreal.
Galt Art Metal Co., Galt, Ont.
Metal Shingle & Siding Co., Preston, Ont.
Patterson Mfg. Co., Limited, Toronto.

CLASSIFIED DIRECTORY *Continued*

Sand and Gravel.
Sand & Supplies, Toronto.

Sash.
L. A. DeLaplante, Limited, Toronto.
Georgian Bay Shook Mills, Limited, Midland, Ont.

Scraper Knives.
Fox Supply Co., Brooklyn, Wis.

Scrapers.
Fox Supply Co., Brooklyn, Wis.
Hurley Machine Co., Toronto.

Scraper Sharpening Device.
Fox Supply Co., Brooklyn, Wis.

Seats, Implement.
Galt Art Metal Co., Galt, Ont.

Sewer Pipe Molds.
Ideal Concrete Machinery Co., London, Ont.

Sharpening Machines.
Luther Grinder Mfg. Co., Milwaukee, Wisconsin.

Sockets, Brass and Porcelain.
Duncan Electrical Co., Montreal.

Soil Pipe.
Standard Ideal Co., Port Hope, Ont.

Soil Pipe Fittings.
Standard Ideal Co., Port Hope, Ont.

Soldering Iron Heaters.
Consumers' Gas Co., Toronto.

Shingles, Galvanized Steel.
Galt Art Metal Co., Galt, Ont.

Shingles, Metal.
Metal Shingle & Siding Co., Preston, Ont.

Shooks.
Georgian Bay Shook Mills, Midland, Ont.

Skylights.
Galt Art Metal Co., Galt, Ont.
Metal Shingle & Siding Co., Preston, Ont.

Sidewalk Prisms.
Consolidated Plate Glass Co., Toronto

Siding, Steel.
Galt Art Metal Co., Galt, Ont.

Sill and Cap Molds.
Ideal Concrete Machinery Co., London, Ont.

Sinks (Kitchen and Wash).
Standard Ideal Co., Port Hope, Ont.

Spanish Roofing Tile Machines.
Ideal Concrete Machinery Co., London, Ont.

Stairs, Iron.
George B. Meadows, Toronto

Stanchions.
Metal Shingle & Siding Co., Preston, Ont.

Steel Buildings and Garages.
Metal Shingle & Siding Co., Preston, Ont.

Steel Ceilings and Walls.
Galt Art Metal Co., Galt, Ont.

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Metal Shingle & Siding Co., Preston, Ont.

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Luther Grinder Mfg. Co., Milwaukee, Wisconsin.

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Luther Grinder Mfg. Co., Milwaukee, Wisconsin.

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Metal Shingle & Siding Co., Preston, Ont.

"V" Crimp Roofing and Siding.
Metal Shingle & Siding Co., Preston Ont.

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Galt Art Metal Co., Galt, Ont.
Metal Shingle & Siding Co., Preston, Ont.

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Ideal Concrete Machinery Co., London, Ont.

Wall Coating.
Alabastine Co., Paris, Ont.

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Ideal Concrete Machinery Co., London, Ont.

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Metal Shingle & Siding Co., Preston, Ont.

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Wire Work.
George B. Meadows, Toronto.

Woodworkers.
Elliot Woodworker Co., Toronto.
Parks Ball Bearing Machine Co., Cincinnati, Ohio.

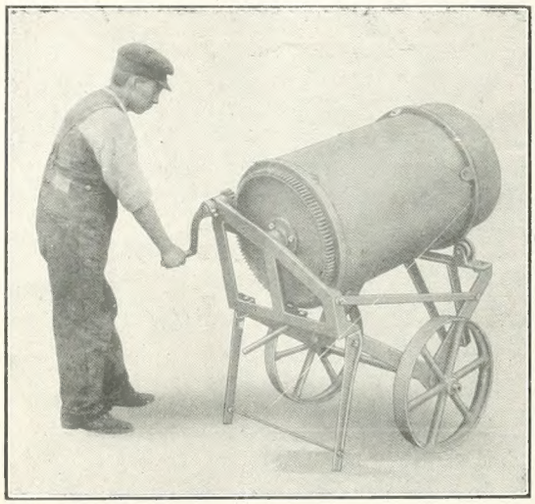
Index to Advertisements

The Wettlaufer Hand Mixer

The Wettlaufer Hand Mixer will save the cost of from two to three men per day over hand mixing.

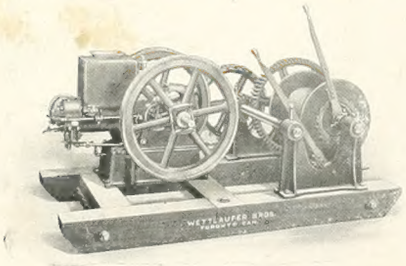
¶ Its the very machine for Foundation Work, Cellars Floors, etc.

Write for Prices.



¶ This machine is all driven with direct gears, and the main bearing, which is at the back of the drum, carries the weight. This means a very easy running machine.

Wettlaufer Hoists

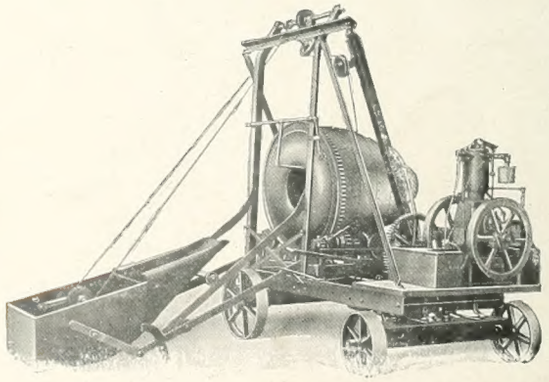


¶ You can get the Wettlaufer Hoists operated by Steam, Gasoline or Electric Power. These hoists have given entire satisfaction upon all kinds of building and contracting jobs. Their capacity for work, and general utility is unlimited.

Write for Prices.

The Wettlaufer Heart Shaped Mixer is seen everywhere.

The Reason: The contractor who owns one will tell you that it gives universal satisfaction.



¶ The Heart Shaped Drum, the "heart" of the Wettlaufer Mixer, insures a perfectly uniform mixture.

The Power Automatic Dumping Device saves from one to two men.

Send for Catalogue which will give complete information about all the important detail features of this machine.

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