ol. 3. No. 12 December, 1913

The Canadian Builder and Carpenter

Catalogue Number

Published by
The Commercial Press, Limited
Toronto

See Page 27
For Explanation of our idea in publishing this number

Midland Planing Mill Products

We are the Originators of

Harmony

in Stock Designs for Interior Trim

Give your work the Tone of Harmony by having the base match the casing, the casing match the head moulds, and the cap moulds the stops, and the stops to match the door moulds.

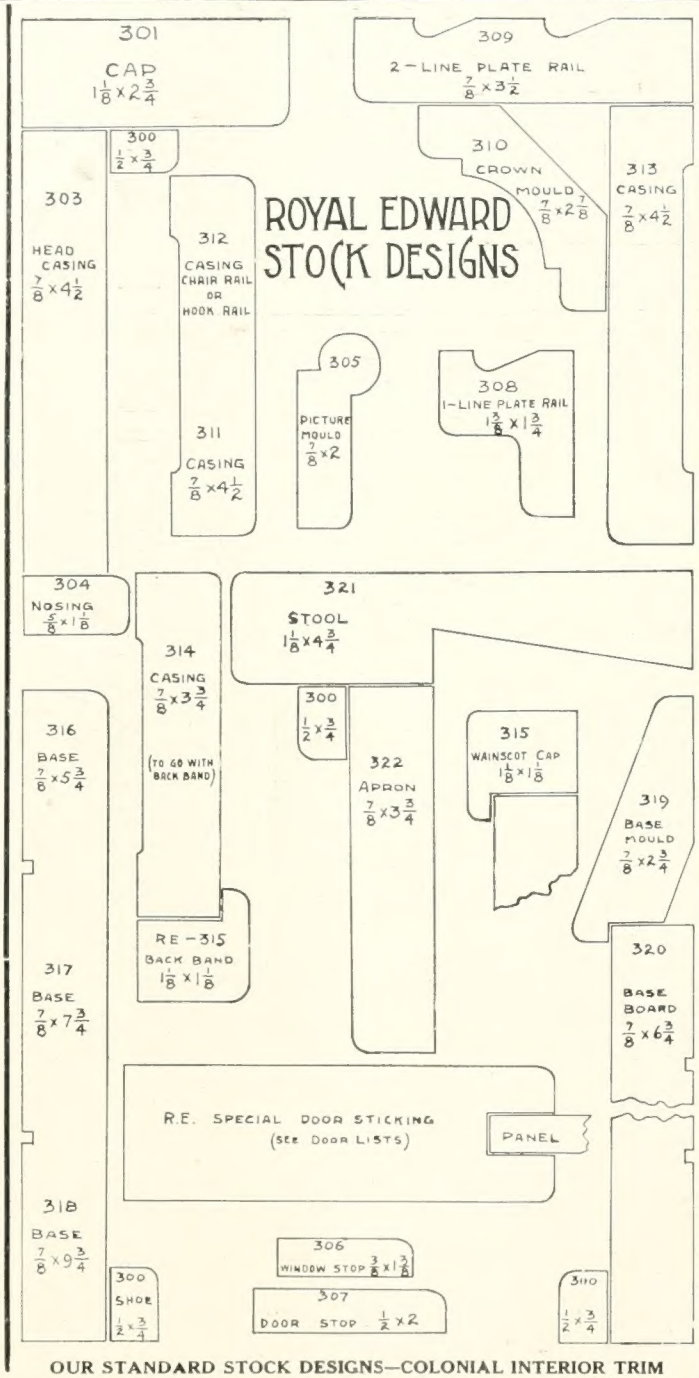
This cut shows you how

Modern Mission

and

Art Craft

Designs are all illustrated in our Stock Designs Catalogue.



OUR STANDARD STOCK DESIGNS—COLONIAL INTERIOR TRIM

UP-TO-DATE LINES

of

Interior Trim

and

Finish of all Kinds

in

Pines and Hardwood

White Pine

Black Ash

Chestnut

Oak

Canadian Red Pine

Etc.

Doors:

Pine for Oil

Pine for Paint

Solid Chestnut

Hardwood Veneer

Slab or Panelled

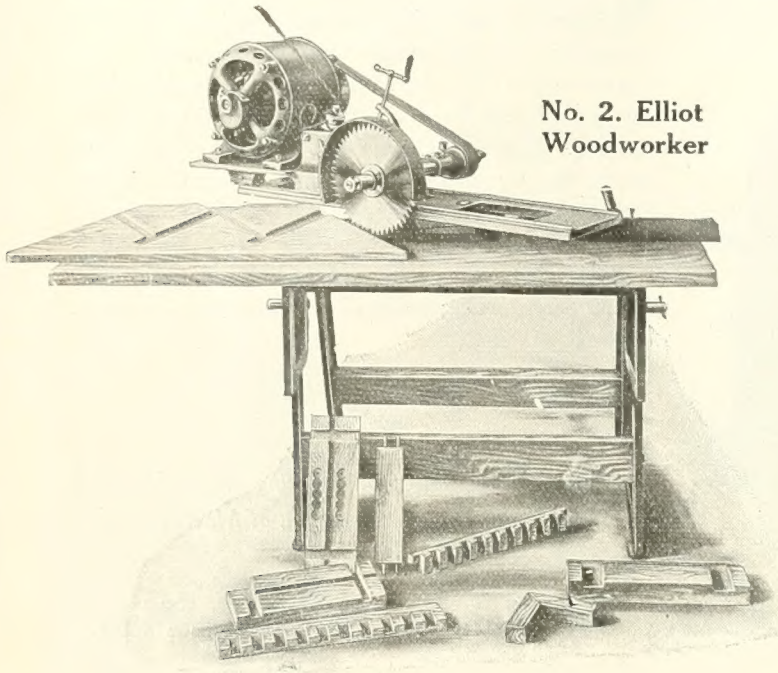
Finish your houses with Midland Doors and Trim

Georgian Bay Shook Mills, Limited

Midland, Ontario

MANUFACTURERS FROM THE TREE TO THE FINISHED PRODUCT

Eight Woodworking Machines in One



No. 2. Elliot Woodworker

What the Elliot Means to You—

The installation of an Elliot Woodworker means a saving of from 20 to 35 per cent. of the labor cost. This has been proved by over 500 Canadian Contractors and builders who use our machine. These recognize in the Elliot Portable Woodworking Machine the greatest labor and time saving machine ever invented for the building trade. The mere fact that there are in use in Toronto 300 Elliot machines to 15 of all other makes, is proof of its merits. One man can set it up ready for use in five minutes in any building, large or small, bringing the advantages of a complete woodworking plant right on the premises while the building is under course of construction. Average running cost in Toronto is about $1.00 a month.

It Will Save Men's Wages

The Elliot Woodworker will cross-cut, rip, mitre, rabbet, groove, plow, bore, stick mouldings, grind tools, do square turnings, etc., **right on the premises.** When set up, simply turn the button and the machine starts. It fills all requirements.

A pair of 16 foot stair string can be routed out in thirty minutes. Treads and risers can be cut to length or ripped to width. Balusters or filling pieces can be cut either square or on the rake. Wedges can be cut. Square newel posts or verandah columns can be built and all mouldings run for same—all on this machine.

No. 2 Elliot Woodworker

Some of the Biggest users of the Elliot Woodworker are:—

The Hudson Bay Co., Calgary and Edmonton, 3 machines.
A. & A. Grant, Toronto, 2 machines. **T. P. Stewart, Toronto.**
The Robert Simpson Co., Toronto, complete outfit of Elliot Woodworkers.
W. E. Woodley, 158 Davenport Rd., Toronto, 2 machines.
Bennett & Thraite, Hamilton, Ont. **J. J. Madill, Toronto.**
Broadview Y.M.C.A., Toronto. **J. J. Walsh, Toronto**
Rutherford & Sons, Montreal. **D. S. Deslauris, Montreal.**
Moore Bros., Wychwood, 2 machines.

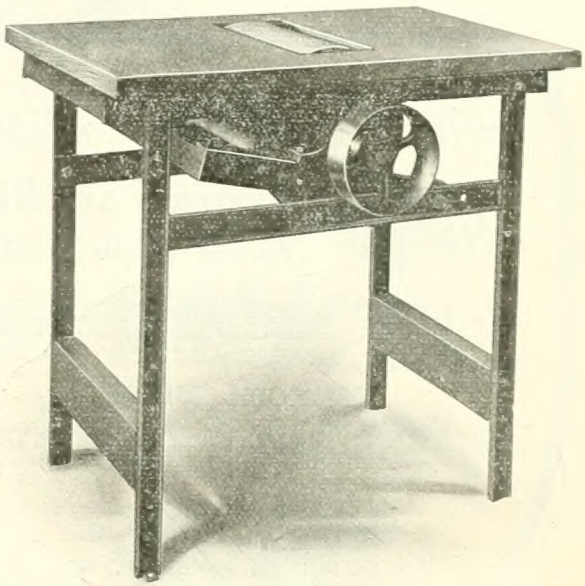
Write to-day for Catalogue and Prices

The Elliot Woodworker, Limited

Bathurst and College Streets **Toronto, Ontario**

The New Elliot Surface Sander

Can be run from the Woodworker or any other Power

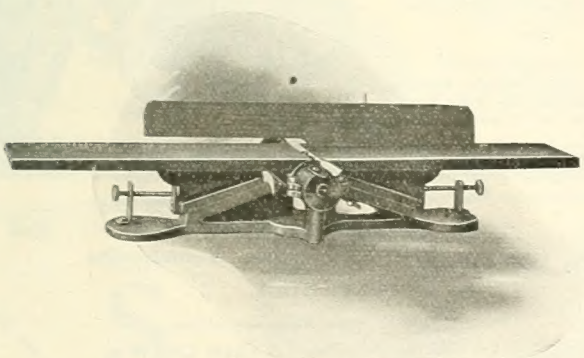


A New Surface Sander which is specially adapted to hardwood trim. It will finish any piece of wood up to 12 inches in width. The cylinder is mounted on a pair of hanging arms with an adjustable spring which prevents the cylinder from becoming clogged by too heavy a cut. It is perfectly balanced, ensuring a perfect finish. This Sander makes a valuable adjunct to the Elliot Woodworker, as it can be run from the same motor. It can be run in a factory from any line or counter shaft.

Our New Bench Jointer is Practical

Meets a Long-felt want

This new Bench Jointer has two cutting knives, and is built to cut 6 ins. wide and 1/8 in. deep in hardwood. It can be used very profitably for edging, dressing up a small job, bevelling hand rails or casing for bay windows and many other purposes. We can equip it with special motor for use in factories or it can be run from any line or counter shaft. Write for particulars of these time and labor saving machines.



Machines may be had direct or from the following:

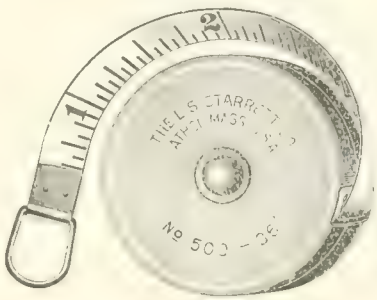
W. A. Rankin, Bank Street, Ottawa, Ont.
Kent-Garvin Company, 160 King Street East, Hamilton, Ont.
Mahon Bros., Fort William, Ont.
H. W. Rosevear & Son, 445 Main St., Winnipeg, Man.
Hugh Rennie, Lougheed Bldg., Calgary, Alta.
H. Rae, 1323, 25th St, Edmonton, Alta.
W. N. O'Neil Co., Seymour St., Vancouver, B.C.
Kingan Hardware Co., Peterboro, Ont.

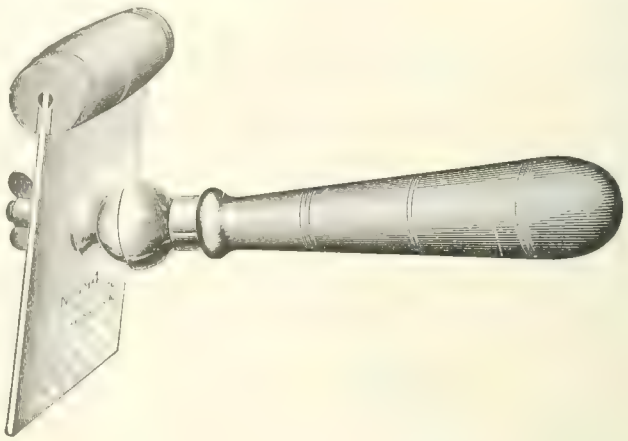
The Elliot Woodworker, Limited

Bathurst and College Streets **Toronto, Ontario**

Read How Easy it is to Obtain Free of Charge either this 60-inch

Starrett Steel Tape or this Starrett Universal Scraper





¶ There are lots of your Carpenter or Builder friends who should be subscribing to THE CANADIAN BUILDER AND CARPENTER, and you by suggesting this to them, and showing them copies of the paper, can easily get their subscriptions.

¶ If you send the names of two of your friends and their addresses together with a dollar bill from each to pay for their first year's subscriptions, we will send you either the Steel Tape or the Scraper, free of charge, and will send the paper to your friends for a year, and send them receipts for their subscriptions.

Either of these purchased in your hardware store would cost in the vicinity of a Dollar. This is a very simple and easy way of obtaining a Steel Tape or a Scraper, and at the same time you will be doing your friends a favor by putting them in touch with a paper like THE CANADIAN BUILDER AND CARPENTER.

Or if you send in four subscriptions (that is, send in four names and four dollars to pay for the four subscriptions) we will send you, free of charge, *both* the Scraper and the Steel Tape.

Then too, if having obtained two or four subscriptions, the work appeals to you, we would be glad to have you act as our Subscription Representative in your territory, and pay you a liberal cash commission on all subscriptions you turn in.

For a starter get two of your friends or acquaintances interested, and get the Scraper or the Steel Tape.

The Canadian Builder and Carpenter 32 Colborne St. TORONTO

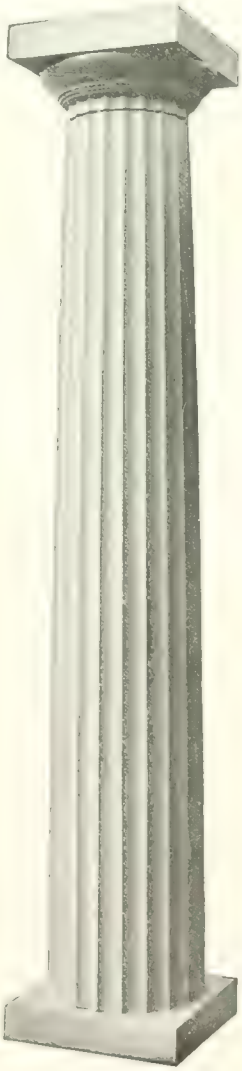
Batts' Staved Columns

Our Columns have a special *Lock Joint* which prevents Staves opening and also increases the Glueing Surface. We use only the Highest Grade of Waterproof Glue.

BUILDERS ALLOWED 10 PER CENT. DISCOUNT ON 8, 10 and 12 in. DESIGNS Nos. 1 and 3

Design B.L. No. 1

Lh.	Dia. 5′	6′	8′	10′	12′
4 ft.	$1.60	1.70	2.25	3.00	5.00
5 ft.	1.85	2.00	2.40	3.25	5.50
6 ft.	2.10	2.20	2.50	3.40	5.75
8 ft.	-	-	3.10	4.20	6.75
9 ft.	-	—	3.50	4.75	7.50
10 ft.	—	—	3.75	5.00	8.00

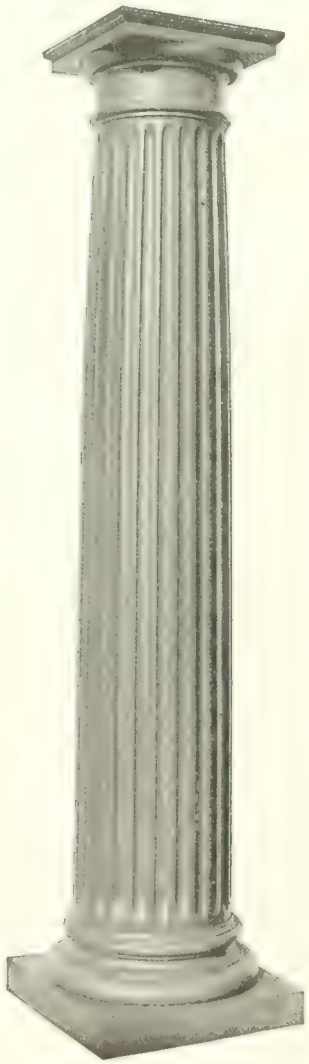


Design B.L. No. 6

Lh.	Dia. 10″	12″	14″
6 ft.	$6.80	8.85	10.60
8 ft.	8.70	9.95	11.95
9 ft.	9.25	10.75	12.90
10 ft.	9.60	11.30	13.55

Design B.L. No. 4

Lh.	Dia. 5″	6″	8″	10″	12″
4 ft.	$2.60	2.80	3.70	4.75	8.00
5 ft.	2.85	3.10	3.85	5.00	8.50
6 ft.	3.10	3.30	3.95	5.15	8.75
8 ft.			4.55	5.85	9.75
9 ft.			4.95	6.50	10.50
10 ft.	—	—	5.20	6.75	11.00



Design B.L. No. 3

Lh.	Dia. 5″	6″	8″	10″	12″
4 ft.	$2.10	2.20	3.00	4.70	6.75
5 ft.	2.40	2.55	3.20	5.50	7.30
6 ft.	2.70	2.80	3.35	5.80	7.60
8 ft.	—	—	4.10	7.70	8.70
9 ft.	—	—	4.55	8.25	9.50
10 ft.	—	—	4.90	8.60	10.05

BATTS LIMITED WEST TORONTO CANADA

If it's Anything in Woodwork for Your Building--*Batts can Supply You*

B.L. 301. Clear Georgia Pine

Sizes in Stock—1¾-in. thick

2 ft. 0 in. x 6 ft. 0 in. — 2 ft. 0 in. x 6 ft. 8 in.
2 ft. 4 in. x 6 ft. 4 in. — 2 ft. 2 in. x 6 ft. 8 in.
2 ft. 6 in. x 6 ft. 6 in. — 2 ft. 4 in. x 6 ft. 8 in.
2 ft. 2 in. x 6 ft. 6 in. — 2 ft. 6 in. x 6 ft. 8 in.
2 ft. 4 in. x 6 ft. 6 in. — 2 ft. 8 in. x 6 ft. 8 in.
2 ft. 6 in. x 6 ft. 6 in.

Price of above doors in Clear Georgia Pine, $2.25

STAVED COLUMNS

VENEERED AND PINE DOORS

NEWEL POSTS

CYPRESS GREENHOUSE MATERIAL

FRAMES

SASH

FLOORING

TRIM

TURNED NEWELS

STAIRS AND BALUSTERS

Etc., Etc.

B.L. 301. Stock Pine Door

Sizes in Stock—1¾-in. thick

2 ft. 0 in. x 6 ft. 0 in. — 2 ft. 0 in. x 6 ft. 8 in.
2 ft. 4 in. x 6 ft. 4 in. — 2 ft. 2 in. x 6 ft. 8 in.
2 ft. 6 in. x 6 ft. 6 in. — 2 ft. 4 in. x 6 ft. 8 in.
2 ft. 2 in. x 6 ft. 6 in. — 2 ft. 6 in. x 6 ft. 8 in.
2 ft. 4 in. x 6 ft. 6 in. — 2 ft. 8 in. x 6 ft. 8 in.
2 ft. 6 in. x 6 ft. 6 in.

Price of above Stock Pine Doors - - $1.75

ALL THE ABOVE DOORS ARE IN STOCK FOR IMMEDIATE SHIPMENT

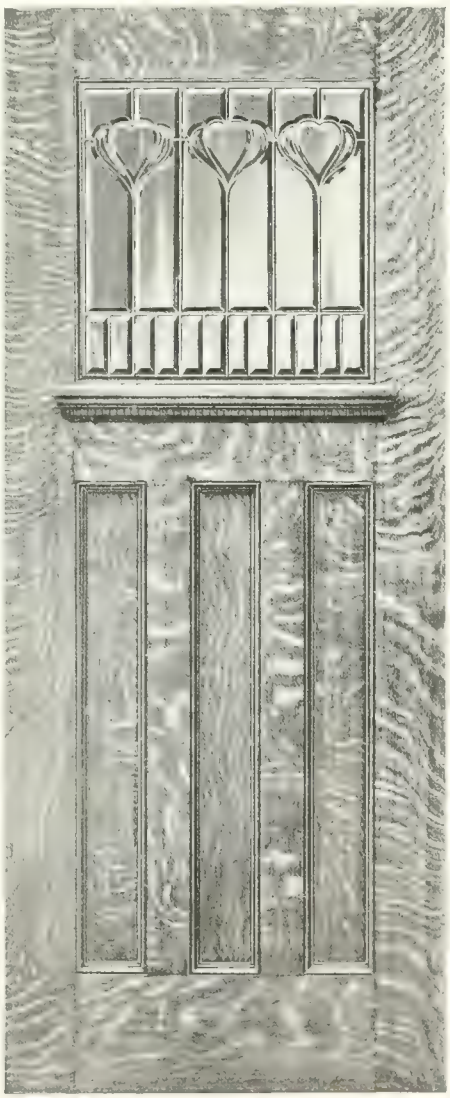
BATTS LIMITED WEST TORONTO CANADA

Batts' 1/4-Cut Oak Doors

There are many other Designs—all equally Attractive—Shown in Our Up-to-Date Catalog. You should send for a copy; it will help You considerably in the Selection of Your Future Requirements.

B.L. No. 304 ¼-Cut Oak

Sizes in Stock		¼-Cut Oak	Pine
2 ft. 8 in. x 6 ft. 8 in.	1¾ in.	Price $6.25	$3.25
2 ft. 10 in. x 6 ft. 10 in.	1¾ in.	Price 6.25	3.25
3 ft. 0 in. x 7 ft. 0 in.	1¾ in.	Price 6.50	3.50



B.L. No. 314, ¼ Cut Oak

Sizes in Stock		¼ Cut Oak	Pine
2 ft. 8 in. x 6 ft. 8 in.	1¾ in.	Price $8.50	$4.00
2 ft. 10 in. x 6 ft. 10 in.	1¾ in.	Price 8.50	4.25
3 ft. 0 in. x 7 ft. 0 in.	1¾ in.	Price 9.00	4.50

B.L. No. 309 ¼-Cut Oak

Sizes in Stock		Birch or Gum	Ash	Plain ¼-Cut Oak	Oak
2 ft. 10 in. x 6 ft. 10 in.	1¾ in.	$9.00	$9.50	$10.00	$11.00
3 ft. 0 in. x 7 ft. 0 in.	1¾ in.	9.75	10.25	10.75	11.75

BATTS LIMITED WEST TORONTO CANADA

If You can't See the Design You Want---Write and ask Us about it

Design B.L. No. 253

Sizes in Stock	Cut Oak Veneered	Solid Birch	Georgian Pine Boxed
4 in. x 4 ft.	$2.75	$1.10	$1.00
4 in. x 5 ft.	3.45	1.25	1.15
5 in. x 4 ft.	3.25	1.95	1.90
5 in. x 5 ft.	3.75	1.50	1.70
6 in. x 4 ft.	3.40	2.00	1.85
6 in. x 6 ft.	4.00	2.25	2.00

B.L. No. 261
Square
3" x 3" 4 ft. 10 in.
Price 22c.

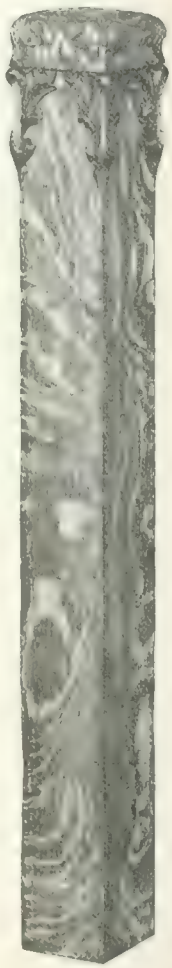
B.L. No. 263
Octagon
3" x 3" 4 ft. 10 in.
Price 22c.

B.L. No. 260
Round
3" x 3" 4 ft. 10 in.
Price 20c.

B.L. No. 251
1" x 2" 6 in.
Price 2c.

B.L. No. 253
I shaped 4ft. 10in.
Price 6c.

B.L. No. 252
I shaped and headed, 4 ft. 10 in.
Price 9c.



Design B.L. No. 210

Sizes in Stock	Cut Oak
6 in. x 4 ft.	Price $4.50
6 in. x 5 ft.	Price 5.00
6 in. x 6 ft.	Price 5.50

B.L. No. 261
Octagon
1¼ x 1¼ 2 ft. 0 in.
Price 8c.

B.L. No. 257
Round
1" x 1" 2 ft. 0 in.
Price 7c.

B.L. No. 262
Square
1" x 1" 2 ft. 0 in.
Price 8c.

B.L. No. 260
Octagon
2" x 2" 4 ft. 10 in.
Price 12c.

B.L. No. 251
Round
2½ x 2½—1 ft. 10 in.
Price 10c.

B.L. No. 265
Square
2" x 2" 4 ft. 10 in.
Price 12c.

WRITE FOR ILLUSTRATED CATALOG

BATTS LIMITED WEST TORONTO CANADA

This Free Book Enables You to do Successful Concrete Work

There are many ways in which concrete can be used to improve city or country properties.

There are many people in every community who would make improvements with concrete, if they could but find someone to do the work.

Every day we receive letters from just such people, asking us to send them the names of contractors in their vicinity, who do good concrete work.

Local contractors can successfully place concrete, and add greatly to their profits by simply following the instructions contained in this book which we send, free of cost, to anyone interested.

It gives complete information about materials, storing cement, necessary tools and equipment, mixing and placing the concrete, and protecting finished work. Photographs of actual work show each stage of the mixing from start to finish.

Send for your free copy to-day

Information Department

Canada Cement Company Limited

Montreal

Sales Offices at

MONTREAL TORONTO WINNIPEG CALGARY

A Message to Our Readers

Explaining the intention we have in issuing this "Annual Catalogue Number," and suggesting the use to which it should be put by Readers.

DURING the winter months of December, January, February and March, you are least busy. During these months you have more time for planning than at any other time during the year. You no doubt use this time working-up and considering ideas for your work during the coming building season.

That is the reason we have issued this Catalogue Number at this time. It is intended for you to use as a *Catalogue of Plans of Houses;* as a *Catalogue of Building Ideas and Methods;* and as a *Catalogue of Building Equipment and Supplies.*

Plans of Houses and other Buildings

THE editors have been working hard for months getting together a large number of good practical plans of representative houses and other buildings. They have endeavored to meet the *wants* of *all* readers. You may not be interested in *all* the plans; but *some* of them are sure to be of value to you in your next season's work.

Practical Articles on Building Methods

THE editors have also endeavored to present an unusual number of practical ideas which you will find valuable if adapted by you to your work during the coming season. Our suggestion is that you think over carefully any of these ideas, so that when the time comes to adapt them in your busy season, you will know exactly what you *want* and *how* you want it.

The Time to Decide on Equipment and Supplies

THE question of equipment should receive your consideration during the slack season so that when you are in the midst of your Spring and Summer work, you will not be delayed by lack of necessary or advisable equipment. *Then* you will not have time to investigate and study thoroughly different types of equipment, so as to get the thing that is *best adapted to your requirements.*

As far as possible, supplies of all kinds which you will use in your coming season's work should be investigated and decided upon before the rush comes. During the winter months is the time to get all information you can along this line.

Use this Number as we Suggest, and you will be Well Pleased

WITH this in view, we have endeavored, with the assistance of advertisers to place before you in this December Number, a *Catalogue* of *Equipment* and *Supplies* of various kinds, which you will find very valuable. It is not of course entirely complete, and we would like to have you write direct to the paper for any information regarding equipment and supplies not to be found in this number.

Please let us have your Suggestions and Criticisms

THIS we trust explains the value of this Catalogue Number; and we hope Readers will use it in the way we suggest. If you have any suggestions or criticisms, *please drop us a line,* so that we may as a result get out a *better* number next year.

The Canadian Builder and Carpenter
32 Colborne Street, Toronto.

A Good Type of Workmen's Homes

Architects and Builders: W. N. McEachren & Sons

Sale Price $2,300

STAFF ARTICLE

MESSRS. W. N. McEACHREN & SONS, real estate brokers, Toronto, own several subdivisions in various parts of the city. One of these includes several acres of land in the northeastern part of the city, in the district recently made valuable by the opening of the new civic car line on Danforth Avenue.

To aid the sale of this land and to induce the workingman to own his home, they have erected a block of fourteen houses and two stores on the property. If the scheme works they will put up many more.

Photographs of the elevation of these, together with floor plans, are reproduced herewith. The two different elevations are used throughout the block, that is, the third is the same as the first, the fourth like the second, and so on.

Each house is built on a lot 14 x 100 ft., and is of solid red brick construction, with sand lime brick foundation. The exterior trim is painted white and contrasts nicely with the brick. The top light of the parlor window is leaded, front doors are of different designs, and these facts, together with the distinct elevations, show that the builders have made a strong effort to give the row an attractive appearance.

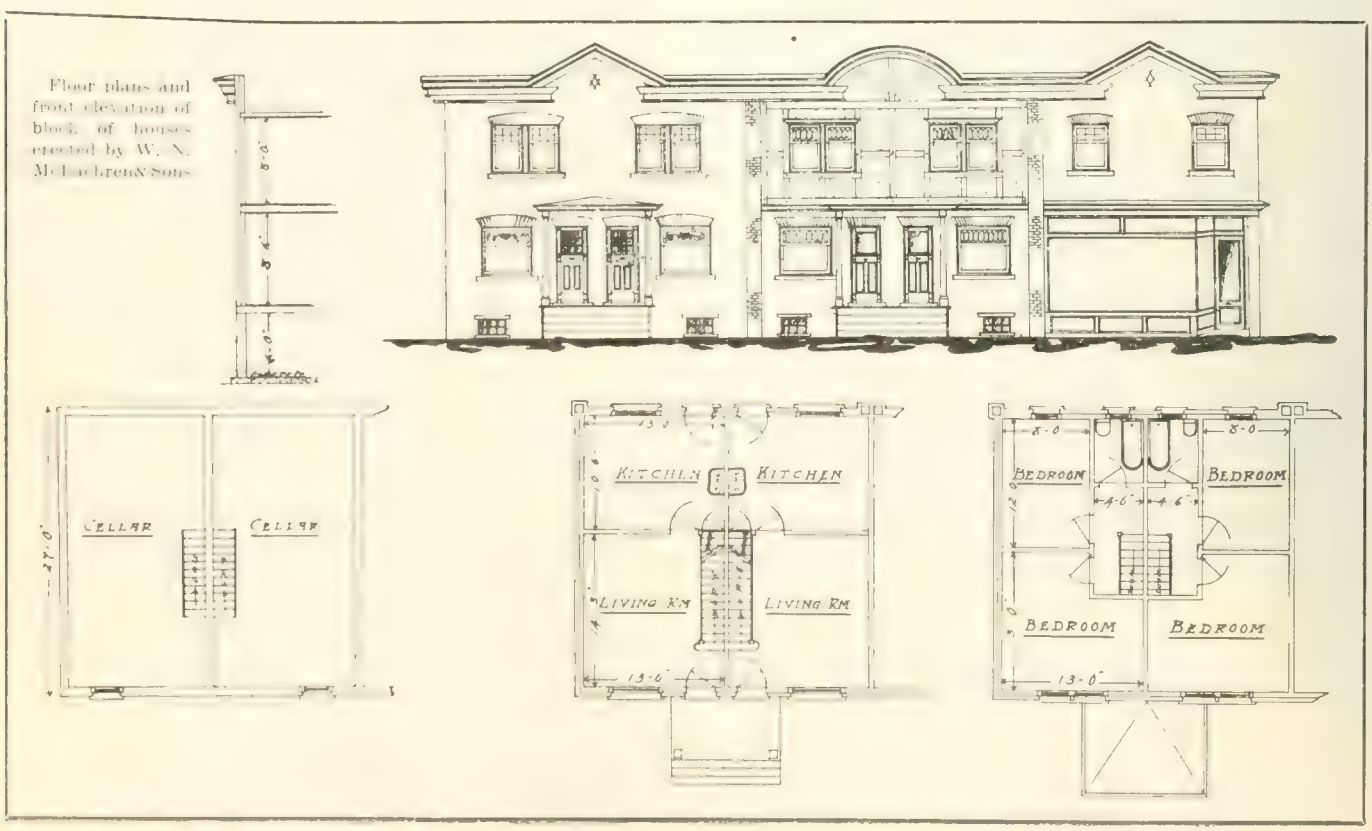
The plans call for a four-roomed house—kitchen and living-room downstairs, and two bedrooms and bathroom on the first floor. All rooms are of good size and well lighted, and the kitchen contains a sink and a built-in cupboard set at a convenient height.

A door from the kitchen leads to the cellar, which is excavated the whole length of the house. A warm-air furnace is located here and space has been partitioned off for coal.

The stairs to the first floor lead from the living-room. The bathroom is located at the head of the stairs, alongside the back bedroom. The front bedroom is larger than the back one, being the full width of the house. Each contains a clothes closet.

Each house is heated by a hot-air furnace and possesses both gas and electric light.

To date, no sewage system has been installed in this



section of the city, but the waste is disposed of by a series of septic tanks.

The system of payment adopted by McEachren & Sons makes it easy for a man to buy one of the houses. The sale price is $2,300. The terms stipulated call for a cash payment of $300 and the balance in monthly payments of $20, with interest. In this way, the purchaser is paying no more than he would have to lay out for the rent of a house owned by another man, and the money is going bit by bit to help him to have a place that he can call his own.

The scheme offers a good suggestion to other builders.

Savings Made By Having Good Tools on the Job

A common saying and one that contains a lot of truth is "Poor Tools Make Poor Workmen." No matter how good a mechanic a man may be, if his tools are not "right" his work will not be up to the high standard of excellence. It cannot be.

When a new man comes on a job, the foreman should see that the tools of the newcomer are in good condition to turn out the best work. Times without number work has to be done over again simply because some mechanic who used poor or inaccurate tools did not get it absolutely right.

Chas. E. White, Jr., writing in Building Progress, tells of a couple of instances showing how important it is that tools be in good condition and absolutely accurate. A tile floor was laid in the kitchen of a new house. The owner and his architect looked it over and were satisfied with the job until they noticed one corner where the range was to be placed later.

"Seems to me that isn't quite level," said the owner, critically.

"Sure, that's level all right," replied the mechanic, "here's the level; try it," and he handed a much battered implement to the owner. They laid it down on the floor one way and then the other, then across diagonally. Each time the bubble came right into the center.

"Guess that's one on me," said the owner and walked off, satisfied.

But next day he looked the floor over again. The fact that it looked out of level and yet tested level seemed odd. Next day he bought a new level himself, brought it to the job and tried it on the floor, surreptitiously. The bubble didn't come into place this time. He put a chip under one end of the level and found his floor three-eighths of an inch low in one corner. Then he summoned the mechanic and tested his level with the new one. The old level was out. It was about as accurate as one of the cloth tape lines "thumb-hand" engineers use; that is to say it was not accurate at all.

There was a row of course. The contractor had to stand for relaying the floor at a cost of 40 to 50 dollars. Owner was sore, architect was sore, mechanic was sore and the contractor was sorer all because the mechanic had been too tight to spend a dollar or two for a new plumb rule.

This lack of proper tools is really no joke when it comes to dollars and cents. There are contractors, in business for years who would be perfectly appalled if they were shown how much money they have lost on poor tools. They wouldn't believe it, though any efficiency engineer can figure out to a penny where a mechanic gets off when his tools are not up to scratch. Some of the lost motion discovered on a job by the lynx-eyed engineer are really funny when analysed. For instance, on a job it was found that about fifteen minutes a day was lost by a young mechanic, on account of a hole worn in the knee of his overalls. He wore a pretty good suit to work every day and pulled on his overalls over his good trousers. A little hole about the size of a dollar was worn in the knee of his overalls and, unconsciously of course, every time he took up a trowel of mortar he was so afraid some of it would go through that hole and stain his good clothes underneath he took three or four extra motions at slow speed to lay every brick. This cost the contractor at $5.50 a day, a nice little sum weekly. He could buy several pairs of overalls for that amount.

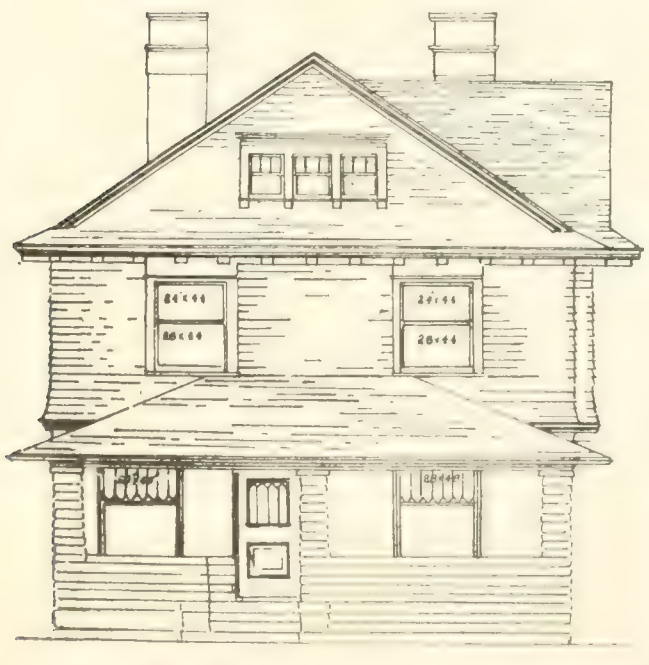
A model bathroom outfit that can be installed at moderate cost. Courtesy of Standard Sanitary Mfg. Co., Toronto.

Montreal Builders' Exchange Year Book

The 1913 year book of the Montreal Builders' Exchange is a very useful volume. It consists of 160 pages 4½ x 7½ ins., and is for sale by the secretary, Builders' Exchange, Montreal. Price 50 cents.

The book contains the constitution, by-laws and list of members of the Builders' Exchange, with legal and practical information for all engaged in the building industry. In the estimating department there are forms and general useful information pertaining to the erection of buildings to which is appended a classified directory of dealers in building supplies.

ATTRACTIVE house of R. McDowall, C.E., Owen Sound, Ont. The concrete blocks are hand chipped, resulting in an effect closely resembling stone. Plans were prepared by Architect Forster, Owen Sound, and the house was built by the owner.



Front elevation of R. McDowall's home. For floor plan see page 32.

Humidity in Winter Heating and its Influence on the Worker in Office, Store or Factory

*By Charles E. Stewart**

In many occupations a comfortable warmth is essential to efficiency, and, as a rule, the employer generally sees to it that the office, store or workshop is well heated, but, in reality, the average heating conditions bring about exactly the opposite of desired results, for, with the exception of certain industries in which moisture is present in the processes, the warmed air is so dry as to have a decidedly deadening and dulling effect on the individual.

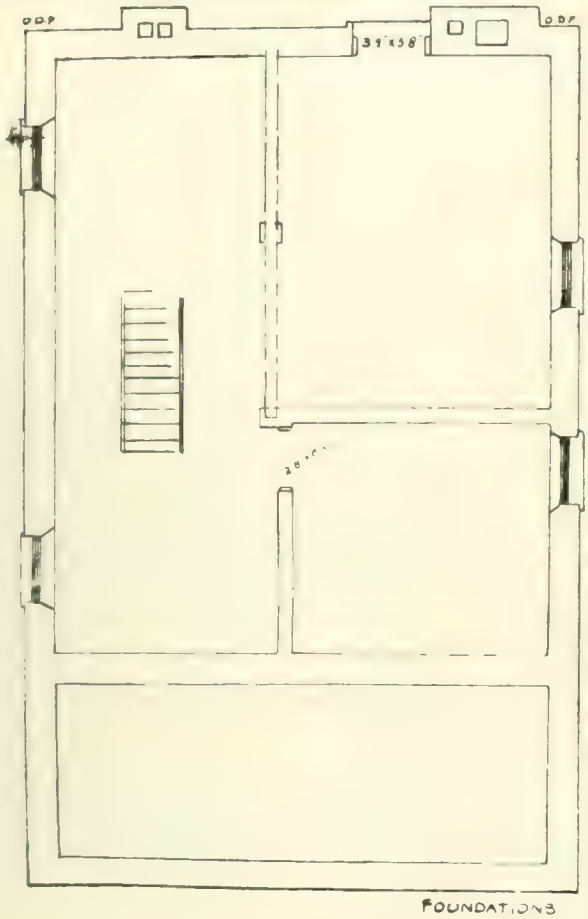
Dr. Orison Swett Marden says, "The man who goes to his task with all of his standards down and his ideas lagging, with a wavering mind and uncertain step, will never produce anything worth while."

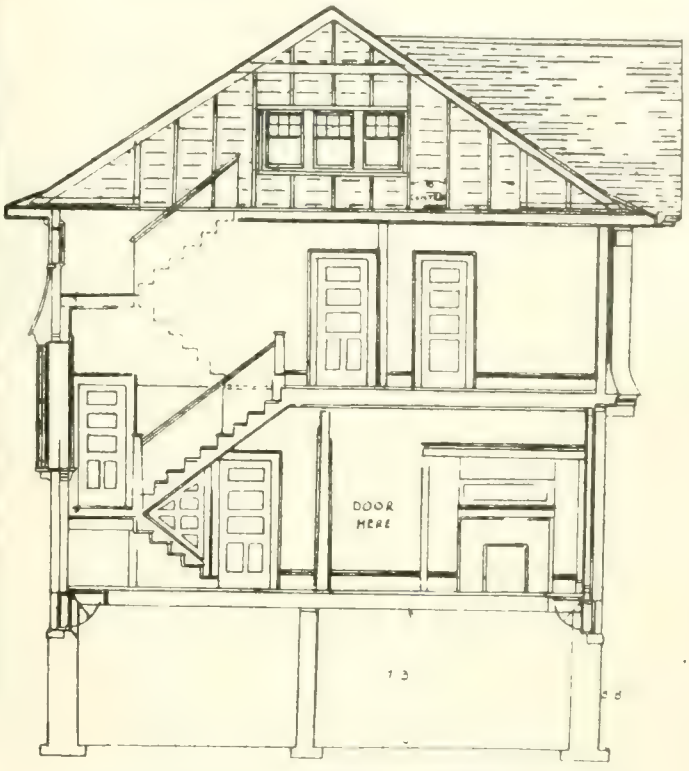
But, it may be that he comes to his work full of life and energy and yet, before the day is half over, is dragging along listlessly and watching the clock for the time to arrive when he will have release from that hot, dry atmosphere in which he has to labor.

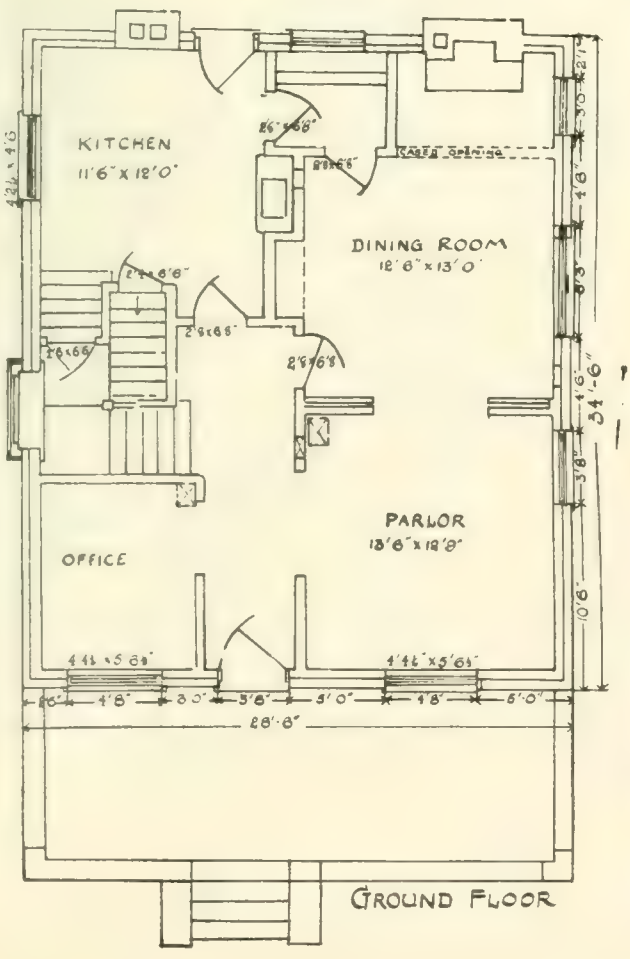
Sidney G. Koon in System Magazine says· "You must choose between humidity and stupidity in your

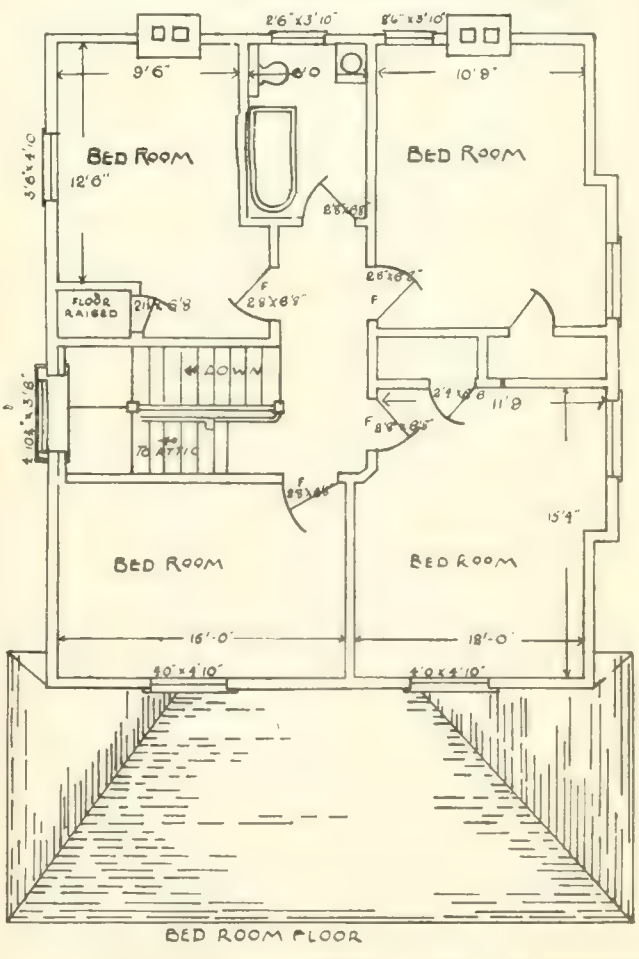
*President of the James Stewart Mfg. Co., Woodstock, Ont.

Sectional Views and Floor Plans of R. McDowall's Residence, Owen Sound, Ont.









store, office or factory during the winter months. Merely to hold the room temperature at sixty-eight degrees will keep things comfortable. If you would have your clerks alert and obliging, your customers good natured and impressionable, however, this is not enough. Both clerks and customers need, in the air they breathe, more moisture than ordinary heating and ventilating systems provides.

In cold weather, the air in the average business building is said to be dryer than that in the desert of Sahara. The air drawn in from the outside, whether through windows and doors or through the intakes of a blower heating and ventilating system, contain a relatively small amount of moisture. The colder the day, the less the moisture. Modern steel-makers, in order to get the dryest possible blasts for their furnaces, drive the air through huge refrigerators before using it. When outside air is heated to living requirements, the moisture is further reduced, and the comfort and working efficiency of the occupants greatly decreased.

On an ordinary winter day, with an outside temperature of thirty degrees and a relative humidity of sixty per cent., the amount of water vapor contained, when this air is heated to seventy degrees, will be less than thirteen per cent. of the maximum, when at least fifty or sixty per cent. is needed for comfort and health."

What applies to school room conditions will also apply to the office, store or workroom, so what Principal William E. Watt of Graham Public School, Chicago, writes in reference to the results of adequate humidity provision made in his school, will be interesting. He says, "Now, what is the result of my pupils' studying in this right atmosphere? Their skins are not parched: their eyes, ears and other sense organs are not dried out: their breathing apparatuses are not filled with disease; and their bodies are not weakened so that the least effort wearies them. They are free from those habitual headaches which they formerly suffered daily. They are able to think. They have a natural desire for knowledge. They can remember what they have read. They are enabled to think naturally. Now that is not theory—I am writing from what I have actually tried."

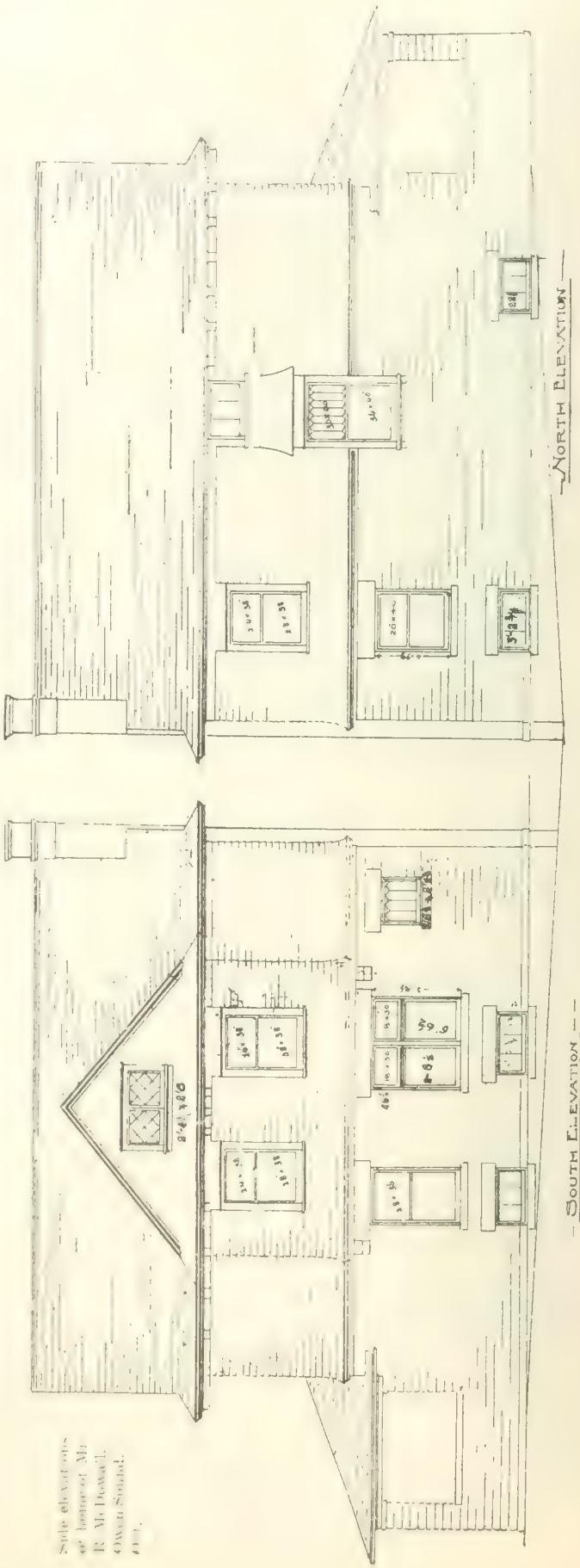
The lassitude, "nerves," irritability and indecision of employees are accepted as necessary evils—though, as often as not, they are due to the lack of moisture in the office, store or workshop atmosphere.

How the Moisture May Be Restored

And the remedy is so simple—restore the moisture. The ordinary house requires an evaporation of four gallons or more water per twenty-four hours to even maintain reasonable humidities, and this will afford some idea of the evaporation necessary in any individual instance. If heated by stoves or radiators keep large pans constantly steaming on them. They may be unsightly and inconvenient, but their benefit will be so appreciable that you will want to retain them.

The warm air furnace, with its constant change of air, would be by far the most healthful form af heating were adequate water evaporation provided, but the waterpan of the average furnace is of such limited capacity that its humidity benefits are practically nil. Under the circumstances the only thing one can do is to have several such pans in the furnace, and these must not be placed lower down than on the level of the firepot, as below that line there is not the heat necessary to vaporize the water with sufficient rapidity.

Next to oxygen, water is the most important element of the atmosphere. Out of doors natural laws help to maintain an average of seventy per cent relative humidity, and in house and shop heating, if we will persist in living in a heated atmosphere practically devoid of moisture, we must suffer the consequences of going contrary to Nature—and lessening of efficiency is but one of the many.



Side elevations of house of R. McDougall, Owen Sound, Ont.

A Six Room Dwelling Erected at a Moderate Cost in Port Arthur, Ontario : :

Builder, S. W. Ray, Port Arthur
Architect, J. C. Stinson, Port Arthur

Port Arthur, Ont., is one of the cities, the building permits of which have shown a considerable increase over last year. Those for eight months, 1913, were $3,249,580 as compared with $2,738,925 for the same months in 1912, being an increase of 108 per cent. New manufacturers are establishing plants, and are bringing in skilled mechanics from outside points, and accommodation must be found for these. The demand for homes is keen. This is shown in the increased building permits. The following instance shows one way in which the demand is being met. One manufacturer on the outskirts of the city already has put up 50 houses, and has taken out permits for 50 more. These are all of the same design and will be occupied by workmen employed in the factory.

All manufacturers, however, are not adopting this plan, and contractors and speculative builders are finding lots to do to keep up with the rush of newcomers to the city and the consequent demand for dwellings. All kinds are required, from the little bungalow to the more comfortable six and seven room home.

Herewith are shown the floor plans and front and side elevation of one of several houses erected by S. W. Ray, of Port Arthur. As will be seen, it is a six-room dwelling and it is of a design that is popular and a good seller in that city. It is of brick construction, with concrete foundation. A square verandah, 6 x 15 feet, with square posts, gives the house a good appearance.

The Basement Layout

The cellar is a large and roomy one, with cement floor and contains a warm air furnace. There are separate bins for the range and furnace coal, and the coal enters these by means of a specially-constructed chute. Three good-sized windows give plenty of light and serve to keep the basement free from dampness.

Ground Floor Plan

The ground floor is well laid out and contains three large rooms, with pantry off the kitchen. The down-stairs hall is 6 ft. 6 in. x 11 ft. 4 in., and the stairs face the front door.

There are two archways leading into the drawing-room, one from the hall and the other from the dining-room. Double windows give plenty of light; in fact the number of windows, and their arrangement, is one of the features of the house.

The dining-room is reached from a door in the hall or through the parlor.

The kitchen is immediately in the rear of the dining-room. Light is essential in a kitchen, and this need is supplied by two windows, one large one at one side and a smaller one in the pantry. The sink boiler is in the kitchen and the sink and dripboard are in the pantry underneath the window.

There is no rear entrance coming into the kitchen, but a door at the side of the house gives entrance to either the cellar or kitchen.

Hardwood floors are laid in all the down-stairs rooms.

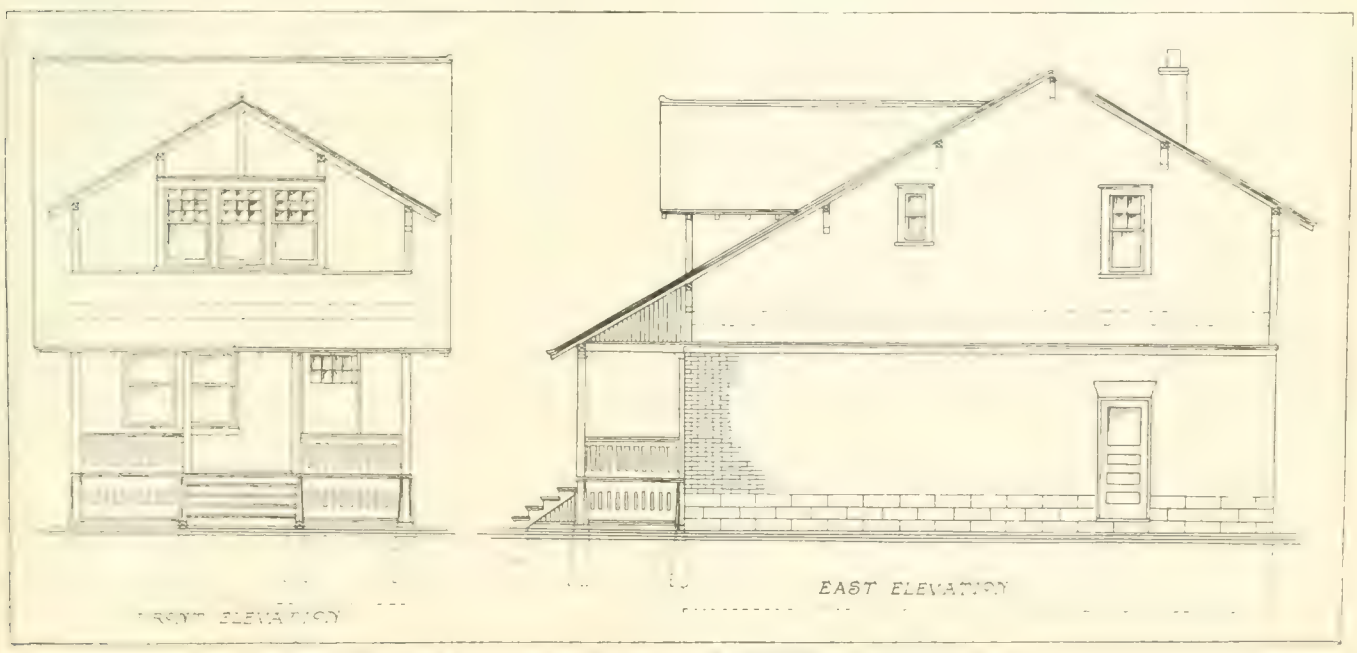
Some Good Features Upstairs

The upstairs of this house was laid out with a view to economizing in space, and that the builder has succeeded may be seen from the plan. It contains three bedrooms, a bathroom and a good wide hall. The bathroom, at the head of the stairs, is 6 ft x 6 ft. and compactly arranged.

The front bedroom has a roomy clothes closet, 3 ft. 6 in. x 4 ft. 6 in., is in one corner, and a window has been placed high up in this; in fact every clothes closet has a window. In putting these in Mr. Ray has followed a good idea that is being taken up by builders all over the country.

A linen closet 2 ft. 6 in. x 3 ft. 6 in. has been built just outside the front room.

The middle bedroom is 11 ft. x 11 ft. This room also has a fine big clothes closet, which was made by cutting into the front room and bringing the closet back to back with the one in the front room. (See plan.) By



Front and side elevation of house erected by S. W. Ray, Port Arthur, Ont.

this method, considerable space was saved in the middle room and very little taken away from the front one.

The back bedroom is 10 ft. x 10 ft. 6 in., with wardrobe and a number of shelves built in one corner for books, etc.

Heating a Concrete Floor

Heating a building by means of steam pipes embedded in the concrete floor has been successfully accomplished in the chassis testing building of a firm of automobile manufacturers. The structure is 120 ft. long by 60 ft. wide, with door openings extending completely across the ends of the building. The workmen are obliged frequently to lie on the floor in making necessary repairs and adjustments, and on this account it was desired to keep the floor surface comfortably warm. To accomplish this 1 in. steam pipes spaced 42 in. on centres were laid 2 in. below the surface of the 6 in. floor slab. The concrete is reinforced locally against cracking, due to the expansion of the steam pipes by corrugated galvanized iron pipes enclosing the former. Below the floor slab 8 in. of cinder fill is place as an insulating material. It is stated that with only five small metal radiators additional it is possible to obtain a uniform temperature of 65 to 70 degrees F. throughout the building.

Ernest W. Sayer, Montreal, an electrician and for many years a director of the Montreal Builders' Exchange, has entered the political field, and will be a candidate for aldermanic honors at the coming elections in his city.

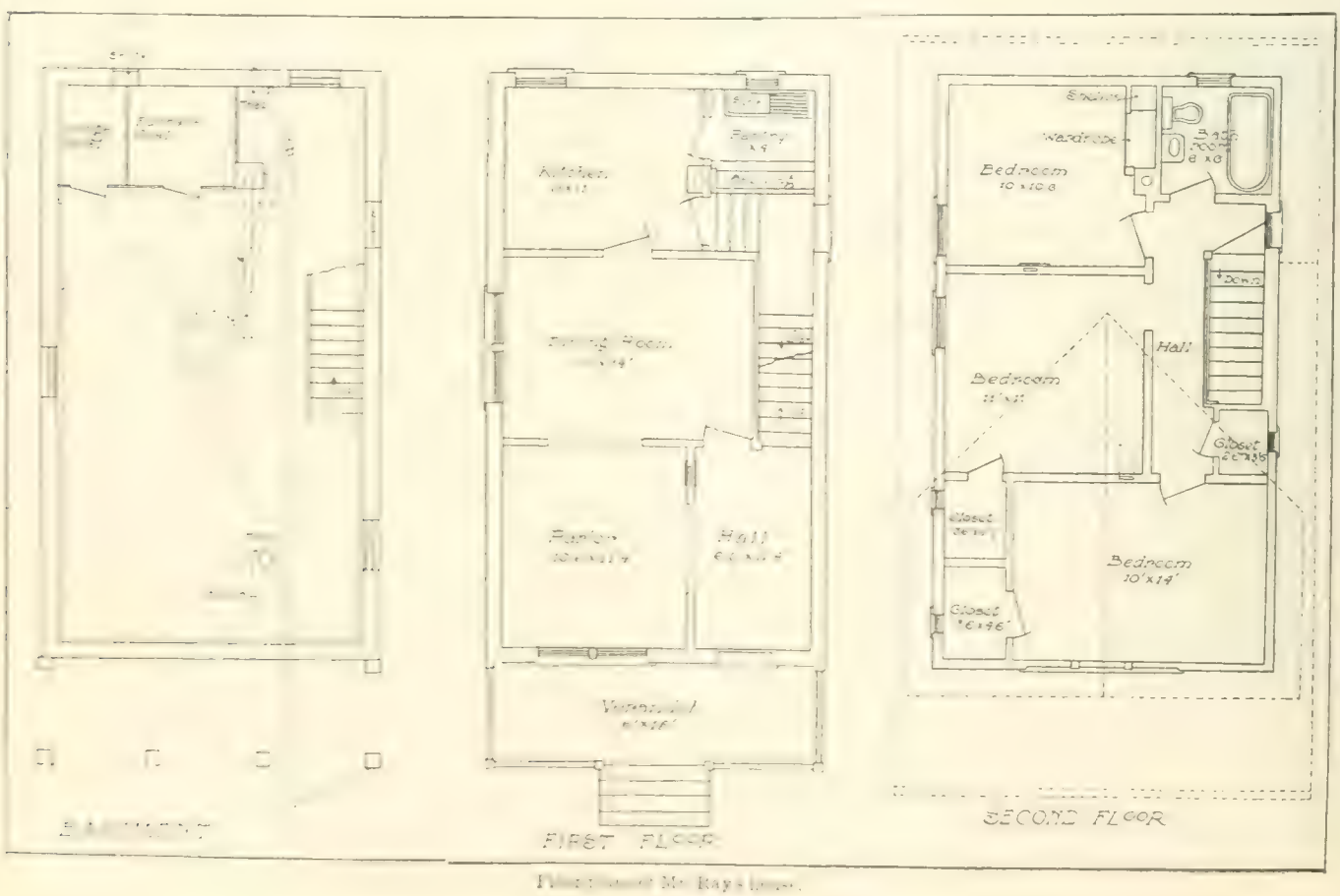
A Device to Make Rooms Sound-Proof

In less than one year, Hiram Percy Maxim, inventor of the Maxim gun silencer, is going to hush every unpleasant noise in Toronto, New York, Chicago, or any other city. The cars and trains will go on thundering, the wheels will rattle, whistles will shriek, cries of hawkers and children will fill the streets, but people sitting at home, in the office, in a railway train or the street cars, will hear none of this.

It sounds Utopian, but it is reality. Mr. Maxim has the device with which he has proved that it can be done. This little instrument is the culmination of years of painstaking effort in investigation research. By the mere pressure of an electric button, any single room or section of a room can be made absolutely proof against noise. There is something uncanny about this wonderful silencer, which, in less than ten months from now, the inventor will demonstrate publicly by first installing it in the ward of a New York hospital.

Fire Prevention Bureau Needed at Montreal

A deputation from several Montreal business institutions, including the Builders' Exchange (represented by Messrs. T. Gilday and R. L. Werry) and the Architects' Association of the Province of Quebec (represented by Mr. J. Perrault), have interviewed the Montreal Civic Controllers and suggested the establishment of a fire prevetion bureau. This should be under the charge of the chief of the fire department, and should consist of an inspector in each of the thirty-seven fire stations which at present exist in Montreal. The controllers asked the deputation to put their wishes into the form of a draft by-law.



Steel truss barn erected for Nicholas Roth, Shakespeare, Ont. The entire frame of this barn, ready for covering, was erected in one day by ten men.

Steel Truss Barn With Clear Space From End to End

Inventor: C. Dolph

Builders: Metal Shingle & Siding Co.

A STEEL truss barn was shown at the Toronto and London exhibitions which has many new features. These may be seen by a reference to the illustrations showing the barns of Nicholas Roth, Shakespeare, Ont. The steel construction of the steel truss barn makes it waterproof, fireproof and gives a large storage area inside, there being no cross-timbers.

The steel truss barn is a combination of steel and wood, all the extension being of steel construction. The steel truss replaces the old cross-beams, purlin posts and interior braces. These braces prevent the building from spreading at any point, brace it against wind pressure and carry the roof load. The trusses take up little room on the barn floor, and give a clear space from floor to roof and end to end. The advantage of this is that sling loads have only to be raised enough to clear what is already on the floor.

The covering of the barn is corrugated galvanized iron. The cornice is made to allow an eave overhang of 14 inches, and a gable overhang of 10 inches. At the first row of corrugated sheets a corrugated "starter" is used to make the ends tight at the eaves.

The doors are light wood framework covered with galvanized iron to match sides of barn. Doors are 7 ft. wide by 12 ft. high, two being provided for each opening. The door is equipped with a sliding door latch, which may be operated from either inside or outside. Doors hang on a trolley roller door hanger.

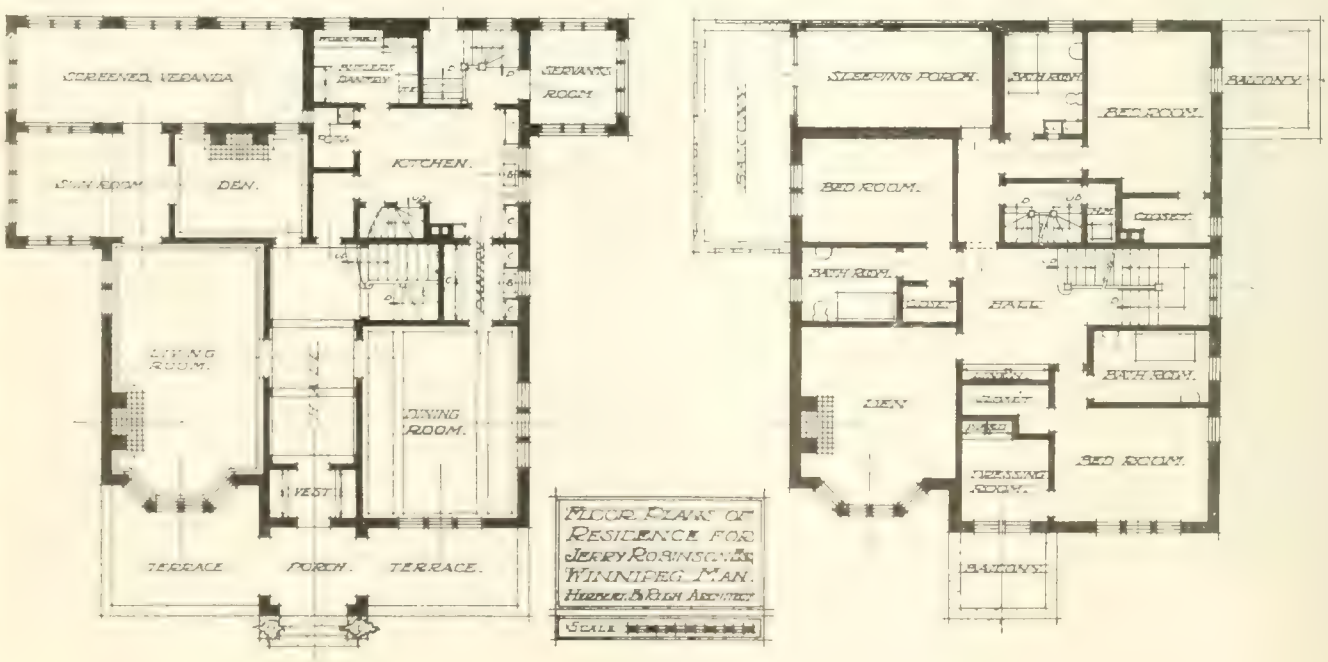
Interior view of the steel truss barn showing large amount of storage space. Note the [illegible] Built by the Metal Shingle & Siding Co., Preston, Ont.

Winnipeg house built of brick.

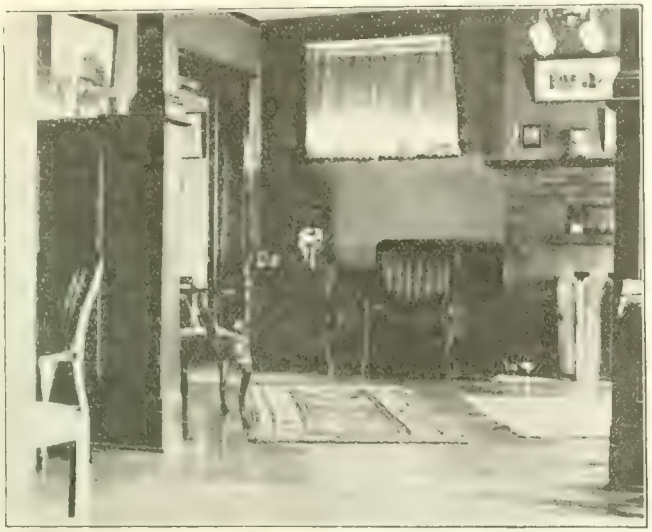
Interior of living room in Mr. Robinson's house.

Winnipeg House Erected at Cost of About $50,000

THE number of brick houses erected in Western Canada is comparatively small when compared with wood. Those that have been built are decidedly attractive, and the home of Mr. Jerry Robinson, Winnipeg, is here shown as a sample of what has been done and what may be accomplished in the construction of home-like houses. The house was designed by Mr. Herbert B. Rugh, architect, Union Bank Building, Winnipeg, who has included in the design many new features which are worth studying. Important among them are the brick porch, brick terrace, sleeping porch, balcony arrangement, etc.



Layout of the brick house of Mr. Jerry Robinson, Winnipeg, Man.



Interior of a Calgary house showing brick fire place.

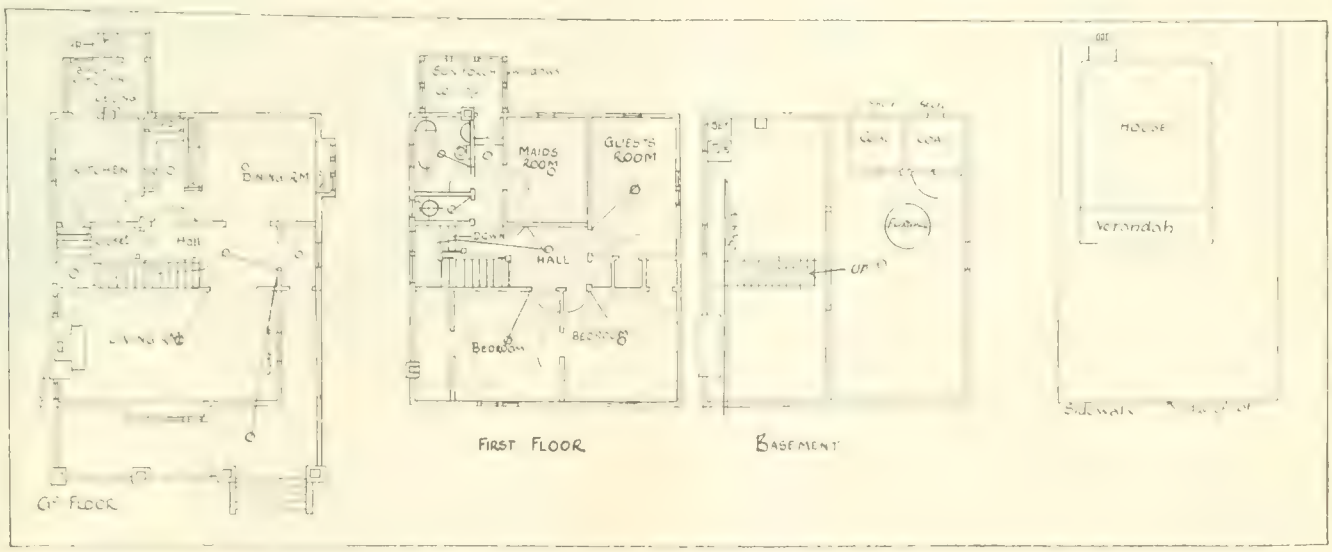
Elevation of large home-like house in Calgary, Alta.

An Attractive Medium-Priced House in Calgary

THE accompanying illustrations show a house erected in Calgary, Alta., by the Alliance Investment Co., 711 First St. West, Calgary, for one of their clients. The design is by Philip N. Logan.

The house is on the square plan, being 30 ft. 6 in. x 33 ft. 10 in., with a verandah extending across the front 8 ft. 6 in. x 30 ft. 6 in. The ground floor contains a living room 12 ft. 8 in. x 25 ft. 3 in., with a square front window, 9 ft. 8 in. frontage; spacious hall; dining room 12 ft. 3 in. x 14 ft. 9 in.; kitchen 12 ft. 3 in. x 9 ft. 3 in., and a back kitchen 9 ft. x 6 ft.

There are four bedrooms on the first floor as follows:—12 ft. 3 in. x 12 ft. 8 in.; 12 ft. 3 in. x 12 ft. 9 in.; 9 ft. 6 in. x 16 ft. 3 in.; and 9 ft. x 12 ft., these being the inside measurements. It will be seen that there is a large basement. The house is well provided with natural light and spacious closets for each room. The position of the electric lights is indicated and their connection to switches.



Layout of Calgary house showing arrangement of rooms and position of house on the lot. In making the cut of the elevation of the house the engravers reversed it.

A Model Canadian Factory

Herewith are published two views of the recently-completed factory of T. S. Simms & Co., Limited, St. John, N.B. The plant was designed by Lockwood, Green & Co., Montreal, and the contract was carried out by the Aberthaw Construction Co., Montreal.

The building is entirely of reinforced concrete with the exception that the panels under the windows are made of one course of hollow-tile blocks. The floor construction of the main building is of the flat slab or girderless type, designed to carry a live load of 150

New factory of T. S. Simms & Co., St. John, N.B., designed by Lockwood, Green & Co., Montreal, and built by Aberthaw Construction Co., of reinforced concrete.

pounds per square foot. There are two rows of columns extending the entire length of the building with bays of 19 feet. The building has two elevator and two stair towers, each being enclosed completely with hollow tile partitions and automatic sliding fireproof doors. Provision has been made for attaching shafting, pipe hangers, etc., by locating slotted inserts about four feet on centres along the ceilings throughout the building. In the basement floors inserts were set similarly to allow for the attaching of motors, machines, etc. The roof was formed over the ceiling of the top story by cinder fill graded to give proper pitch, smoothed off with a cement grout and covered with tar and gravel roofing.

In erecting this building the Aberthaw Company used a very economical concrete plant. The aggregate, which was secured from a gravel pit about a mile distant, was brought in on railroad cars, unloaded through quick-unloading chutes to rotary dump cars on a narrow gauge track. The materials were then hauled to the hopper of mixer where cement was also added. The mixed concrete was hoisted by a hoist bucket in tower and dumped into industrial V-shaped cars which took the concrete to the point wanted.

Maisonneuve, Que., to Build Model Homes

The city of Maisonneuve, Que., a suburb of Montreal, has, through the local council, promised aid to all private enterprises that will erect blocks of suitable workmen's homes. The matter is now before the legislature, and it is stated that if private parties will not take the initiative, the city council will take the matter in hand and erect a number of dwellings.

At the present time there is a big scarcity of houses and lodgings at Maisonneuve.

Excellent Layout of Stores and Apartments

The old objections to living over a store have been removed almost entirely, and there is now more or less of a desire, particularly on the part of newlyweds, to rent apartments over a place of business. As a rule, such apartments are more quiet and are built close to a car line, a situation desired by most business men.

The accompanying plans show the layout of four stores, with apartments overhead, built by S. J. Breen, at the corner of Roncesvalles and Harvard Avenues, Toronto. The block is built on a lot 25 ft. x 73 ft. 5 in., the short end being on Harvard Ave. The main entrance to the apartments is on this street. Stairs on the outside at the rear lead to the suite on the first floor and to the entrance to the back stairs leading to the second floor, these latter being inside the building.

All the stores front on Roncesvalles Ave., and have a rear entrance to the alleyway at the back.

The basement contains a large hot water furnace that heats both suites and the stores. The store tenants have store-room accommodation in the cellar, but the apartment dwellers are not so favored.

As will be seen, a suite is composed of five rooms, a bathroom and a large sun room at the rear. The latter has casement windows.

The pantry is off the kitchen and has built-in cupboards, with a casement window set high up in the wall. Shelves have been put up on the walls.

The bathroom is a three-piece one, with built-in medicine cabinet on the wall.

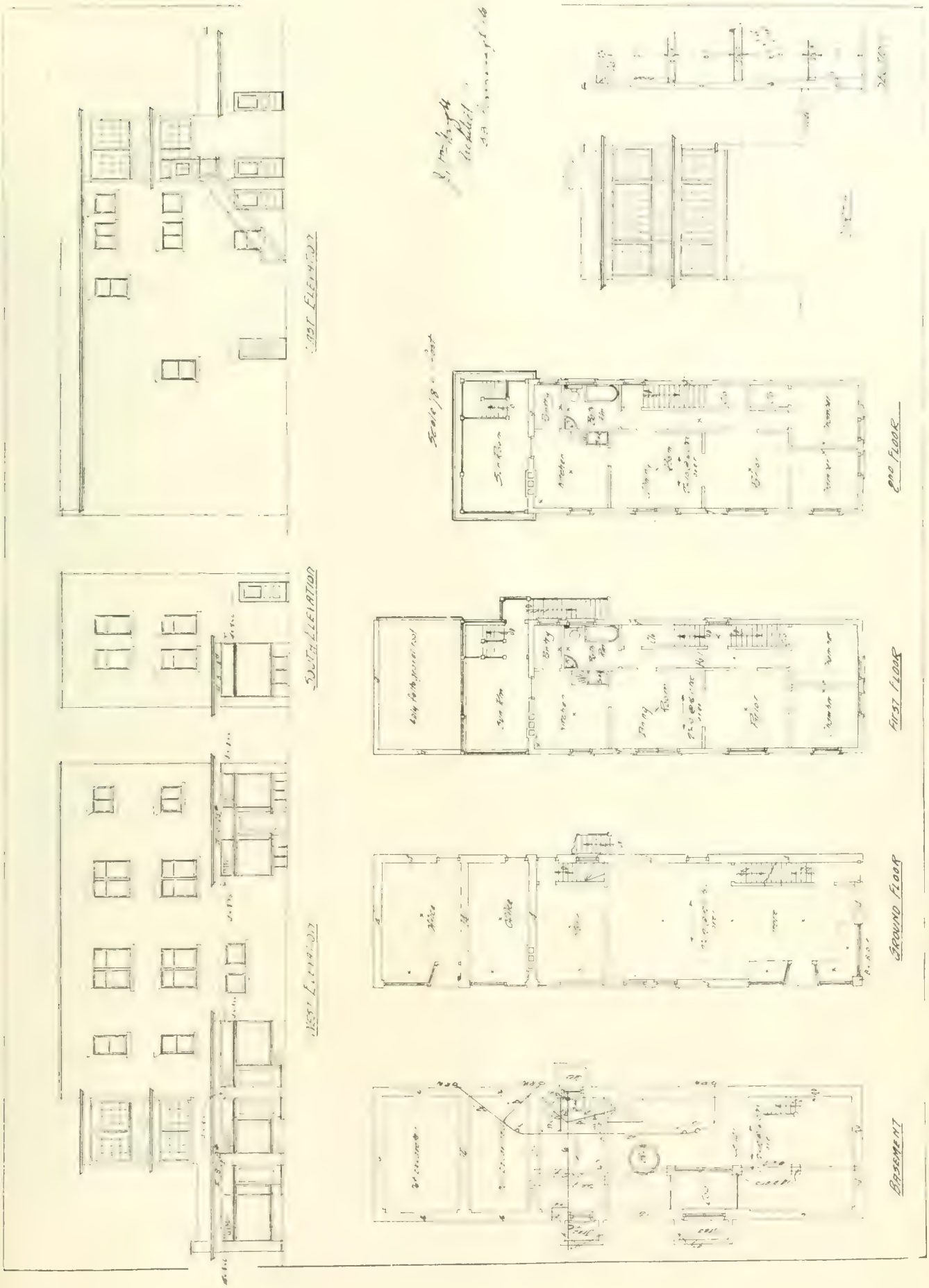
A roomy cloak hall has been built off the main hall and underneath the stairs.

Interior of factory of T. S. Simms & Co. manufacturers of brooms, whisks, etc. Main building is 400 feet x 52 feet, four storeys and basement.

Hardwood floors have been laid throughout both suites. The trim is in Georgia pine.

The block is lighted by electricity, with gas connection in the kitchens of the apartments.

The building is built of red stock bricks on a 20-inch stone foundation. It is fronted with buff pressed brick, resembling in appearance a firebrick. The total cost, without land, was $9,000.



Elevations and floor plans of stores and apartments at the corner of Roncesvalles and Harvard Aves., Toronto.

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Vol. 3 TORONTO, DECEMBER, 1913 No. 12

Editorial Comment

Annual Catalogue Number of The Canadian Builder and Carpenter.

We present to our readers herewith the Annual Catalogue Number of The Canadian Builder and Carpenter. The Editors hope that readers will find it of special value during the winter months when planning the next season's work. There is a saying that "Knowledge is Money," and the explanation of many successes in the building trade is the fact that these men have studied carefully the trade in all its phases. One of the most important features is the layout of work and selection of equipment between seasons. In this you will find the December issue a decided help. Advertisers have sought to give readers information that will be useful for reference during the buying and planning season. This idea has also been carried out in the selection and publication of numerous plans of various buildings in the editorial pages, and in the articles which contain useful information for the builder in arranging for next year's work.

* * * *

The Essentials of a Good Cellar.

The popular idea of a cellar is a four-walled room and a concrete floor with a coal-bin of old boards in a corner. If a little thought is given beforehand, however, a cellar may be built which will not only be much more convenient and sanitary, but will make the owner or purchaser better satisfied with the house. Not only this, but it can be built at very little added expense.

One of the first points to consider is the design. The cellar should be deep enough, for instance, to allow headroom under the pipes if a hot air furnace is installed. The concrete floor should be well drained. This is very important and sometimes a hard thing to do, especially in a long house, without using at least two drainage pipes. The windows should be arranged to allow sunlight at certain hours of the day.

In visiting various houses, we have seen the cellar or basement put to a great many good uses. Usually brick divisions separate the basement into rooms. For instance, in several houses the laundry was walled or partitioned off to prevent the steam pervading the rest of the basement. Also a clothes chute connects the laundry with the upstairs, openings being in the kitchen and bathroom or linen closet so that soiled clothes may be disposed of at once and collected in a basket in the laundry ready for washing day.

The furnace should be in a room by itself so that certain parts of the cellar may be dark and cool for fruit, the fruit being kept either in dark cupboards or in a fruit room partitioned off from the rest of the cellar. Connecting the furnace room with the outside there should be a rear exit for ashes, especially when the only entrance to the cellar is through the kitchen. A direct entrance to the cellar either at the back or side of the house may also be used for receiving vegetables, etc. Also, a coal chute will be found to prevent the dirtying up of windows with coal dust, and a completely closed-in coal bin will prevent coal dust covering everything in the cellar.

Several houses erected recently have closets in the basement so that children especially will not be running upstairs during the day. Some of the houses have children's playrooms in the basement, others workshops, billiard rooms, etc. We offer this review and these suggestions with a plea for more consideration in the laying out and construction of the cellar.

* * * *

Said the Vacuum Cleaner to the Builder.

Five years ago few people used electricity or gas, and few had their houses wired or piped. Now the use of one or both is very common. Old houses have been wired, and new houses would not be complete unless arranged for the electricity, and in the cities and certain districts piped for the use of gas.

This is apropos the increasing use of vacuum cleaning outfits. Many permanent ones are being installed, the house being piped and a receiver and motor being placed in the basement. Pipe outlets are in each room and a switch in a convenient place starts and stops the motor. The installation costs about $200.

It occurred to us that in regard to the vacuum cleaner, that five years hence some of us may be in the same position as those who did not wire their houses five years ago.

Season's Greetings to Our Readers

AT the glad season of the year, when we have our December celebrations and begin anew on January 1, 1914, to make new friendships and build up better and greater business; to strive anew to construct our reputations for honest work, and to begin again to push indomitably and indefatigably towards the goal to which ambition leads, we extend our best wishes that the strong foundation laid by study and hard work will make the construction of the first floor an easy matter, and thence storey upon storey until the whole work is complete.

Our wishes include a Happy Christmas and a Glad New Year.

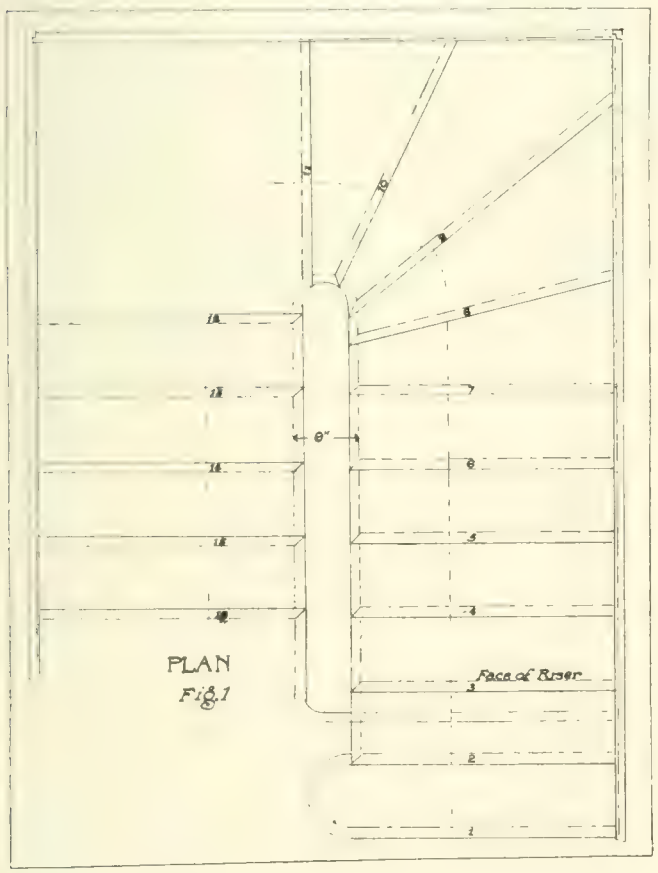
THE EDITORS AND MANAGERS.

Carpentry and Woodworking

Third Series on Stair Building and Hand-railing on the Block System

By John MacLachlan

Figure 1 shows the plan of a well stair with open stringer, having four winders and quarter space landing. The position of risers are shown by the dotted lines in plan. The steps are placed in such a manner as to give the handrail a graceful falling line. The first thing to be done is to take the sizes on a rod; cut

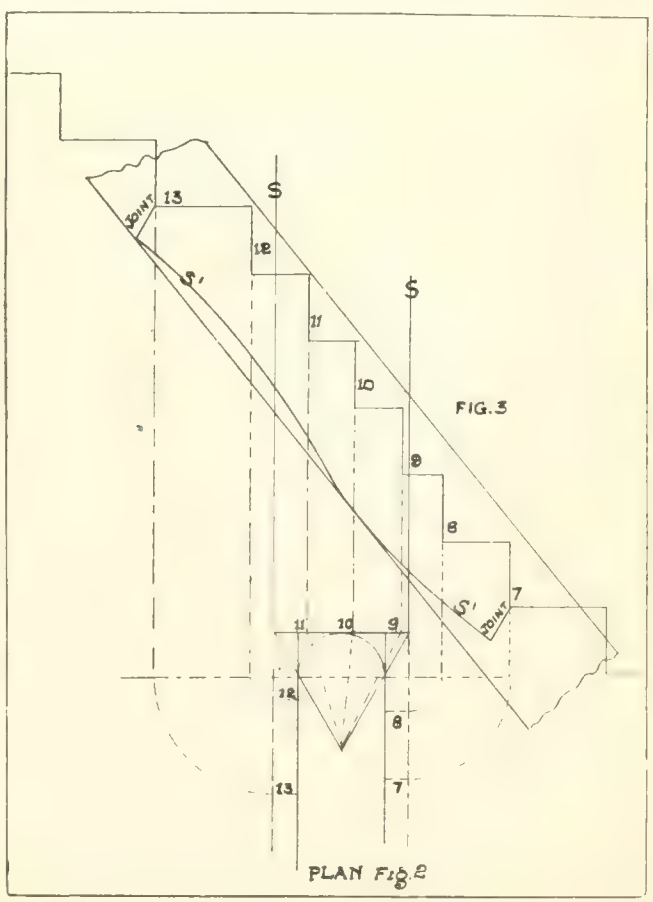


this rod between the walls; set off on each end of this rod the thickness of the plaster, then set off the face of wall-string, so that they will be flush with face of base or skirting. Now set back from the face of the string half an inch, the depth (of checking or housing). This will be the end of the tread and riser. Next set off the centre on the rod and mark half the width of well on each side of this line.

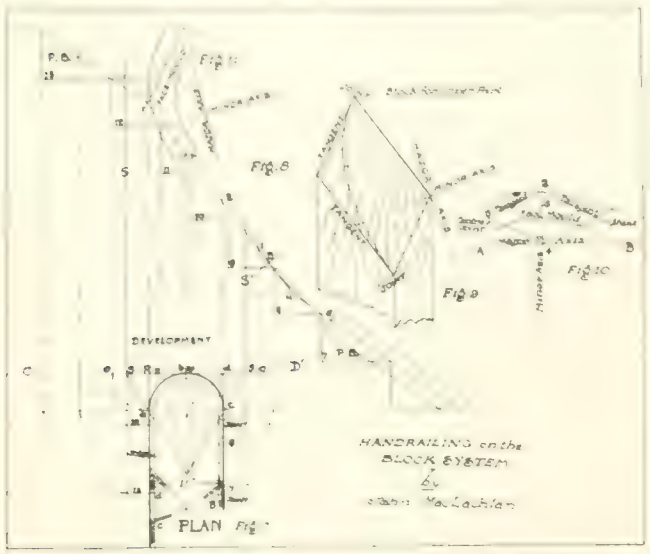
Figure 2 shows the plan of face of well with arrangement of risers.

Fig. 3 shows development or stretch out of steps, etc. Cut a piece of thin board, to fit the face of string around the circle on plan as shown, and mark the spring and position of risers, as shown number 7, 8, 9, 10, 11, 12, 13. A cylinder should be made to fit the inside face of the circular string. Before the veneer is put on glue paper all over the outside of this cylinder, letting it dry. Bend the lath around the cylinder on top of the paper and mark the springing as shown on both sides. Do this at both ends, marking the spring down the sides with a straightedge. Now get a piece of veneer, a full 1-16 in. thick, to the size shown in Fig. 3. Cut the bottom edge to the curve, marked S^1 S^1. Mark the springing and each step on veneer, it being as well to mark this on both sides. In putting this on the cylinder take care to have it the right hand. Fix on one side first, with a hand screw, so that the springing on the veneer is on the springing on cylinder; then bend it round and fasten the other side temporarily. Then get two pieces of veneer ⅛ in. thick and about 1 in. wide, cutting it to the shape of the curve S^1 S^1. Now bend the two pieces round the top of the first piece, keeping the edge S^1 S^1 flush with the bottom edge of the large veneer.

It will be seen that the three thicknesses of veneer will form the sinking in the string 5-16 in. deep. Next get a piece the exact thickness of the sinking, and cut it to the shape as shown in Fig. 3. Put plenty of saw kerfs in the direction shown, that is, parallel to the springing; let the kerfs go past the springing a bit on both ends. Now bend this around the cylinder with the kerfs next to and the edge close up to the veneer. Now get the staves about two inches by two inches and bevel



the edges to fit each other around the circle, hollowing the under side to fit the veneer; also cut the ends out to fit over the sinking. Start one side first with a straight piece as far as the spring, and screw it down. Then work from this piece and go right round, screwing each piece as it is fitted until they are all on. Next



in centre, take off one side, numbering each piece as it is taken off. Lift up each of the three pieces of veneer and glue between them. Screw the staves on again, except the centre one. Take them off the other side and glue on all staves again.

Figure 4 shows enlarged view of stair stringer and carriage rough blocks and also balusters. The brackets are mitered to risers.

Figure 5 shows wall string. Bottom flight is tongued, as shown on ninth step.

Figure 6 shows plan of bottom step.

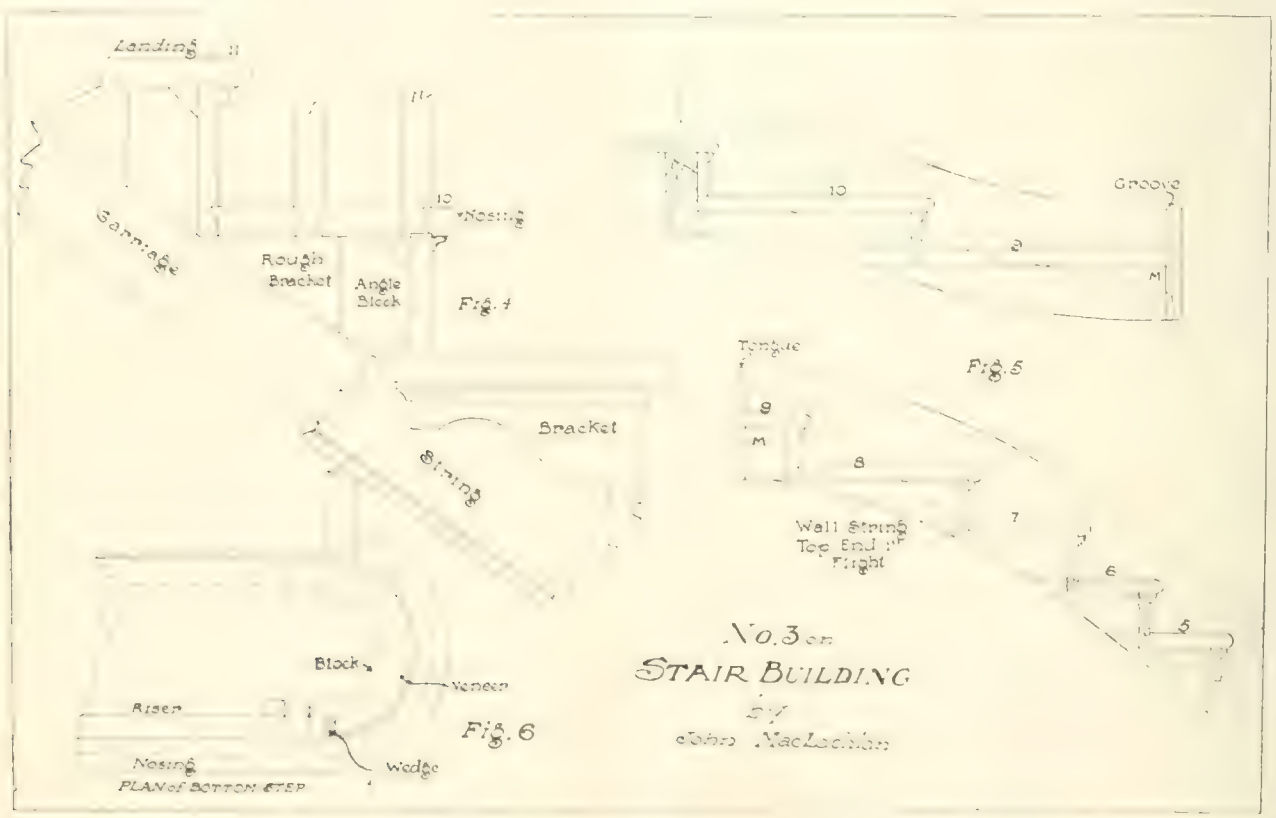
The method for setting out the handrail is similar to those which have appeared in the August and September issues, but for the benefit of new readers I will endeavor to explain the most important lines.

Figure 7 is the plan of rail; 11 inches centre to centre of rail; abc is centre line of rail, C^1 D^1 is the base line, and SS spring line. To get the development(or stretch out) unfold tangents, by placing leg of compass at R, and with distance RA, swing over to base line C^1 D^1 at O. Do the same at d, and with distance dc swing over to O. Then erect perpendiculars.

To obtain the elevation and position of risers and steps. draw line from apex of a triangle (right angle) having the radius for base, the hypotenuse being inclined at 60 deg., cutting through the several points on the plan. Produce until they meet the opposite tangent, then erect vertical lines and mark the height of the risers. Then draw line from top pitch board at riser 13 to F, and then from this point to letter H, which gives the falling line. There is an easing on bottom rail, as shown B and J.

We will now take Fig. 10, which deals with bottom face mould. Draw any line as AB and square from it 4-2. Then take the diagonal 1-d on plan, Fig. 6. Make the distance 4-2 equal; next taking 1-2 in development and from 2 mark 1 and 3 in face mould with same radius from 4. Bisect 1 and 3; draw tangents as shown through 2; next take radius of centre line of rail only, and mark on 4-2. Draw half width of rail on each side, as shown at 6. The width of face mould at joint 3 and at shank is obtained from bevel on plan marked B. Fig. 7. Where rail is one pitch, across two tangents, this method will apply as 1-2 and 2-3.

Fig. 9 shows a solid block covering the quarter circle, as this block is the same as Fig. 11. There is the pitch



Double Dove-tailing

The [illegible] dove-tailing [illegible].

Fig. 1 shows the dove-tail in perspective, after being glued up, with thin piece, A, also glued on the inside to cover extended notches in the inside corner of box (see dotted line at B, Fig. 2).

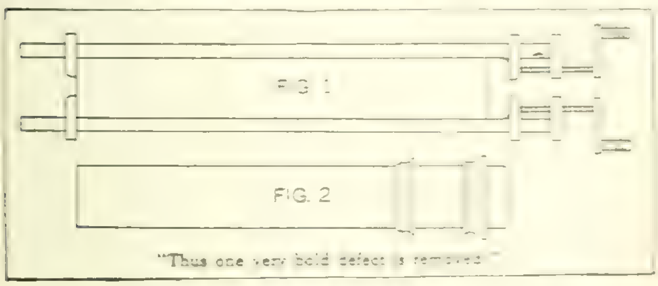
Fig. 2 shows end and side before being glued together.

FIG. 1 FIG. 2

When neatly finished with inside piece glued on lengthwise of very thin veneer deceives the most experienced [illegible].—[illegible]

Cover the Nails

The man who goes around continually finding fault about a job that somebody else did may be called a crank, but may be nothing more nor less than a good mechanic. As such he never has any difficulty about finding defective workmanship, and in time it becomes a habit. He cannot put his hand on the newel post and enter on the stairs without first noticing whether the man that built the newel post knew enough to hide the nails or not. Many times a job otherwise fairly well done is in the end disfigured with ugly nail holes.



"Thus one very bold defect is removed."

Caps should never be nailed through the top. Use clamps, as shown in Fig. 1. Toe-nail through post, then cover nails with the cap molding, as in Fig. 2, and one very bold defect, so often found, is removed.—F. G. W., in The W[illegible].

Seat and Plumb Cut of Hood Rafters

Question—What is the rule for cutting hood rafters for a barn if the lower cut is 20 inches and the upper cut is 14 inches? What will be the bevel cut on the upper end of the hood rafter, the pitch of the barn to be 9 inches to 12 inches?

Answer—The seat and plumb cut of hood rafters is identical with that of the common rafter. In other words, if the cuts of the common rafters are 20 and 14, as stated, [illegible] of 9 to 12, as stated. Consequently, 8¾ and 12 would [illegible] 20 to 14.

Estimating Board Measure

[illegible]lian Builder & Carpenter, Toronto:

[illegible] would like a definite explanation of [illegible] "Board Measure." [illegible] tell me? J. F. D., Peterboro, Ont.

The Montreal Builders' Exchange Year Book explains this term as follows: The rough lumber used in framing is measured by the board foot, which means a piece 12 in. square and 1 in. thick. Lumber is always sold on a basis of 1,000 feet board measure; the customary abbreviation for the latter term is B.M., and for thousand is M., thus 500 ft. board measure, costing $14.00 per thousand, would be written 500 ft. B.M. at $14.00 per M.

To obtain the number of board feet in any piece of timber, the length of the scantling in inches may be multiplied by the end area in sq. in., and the result divided by 144. For example, the number of feet B.M. in a floor joist 20 ft. long, 3 in. thick, and 10 in. deep, will be 240 in. (20 ft. x 12) multiplied by 30 sq. in. (the end area), or 7,200 sq. in., 1 in. thick; dividing by 144, the result is 50 ft. B.M.

The rule used by most contractors and lumber dealers is as follows: Multiply the length in feet by the thickness and width in inches, and divide the product by 12. Thus, a scantling 26 ft. long, 2 in. thick, and 6 in. wide,

contains $\frac{26 \times 2 \times 6}{12} = 26$ ft. B.M.

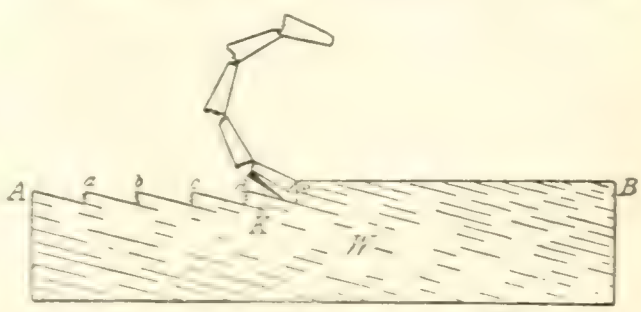
This rule, expressed in a slightly different manner more convenient for mental computation, is: Divide the product of the width and thickness in inches by 12 and multiply the quotient by the length in feet. Thus, a 2 in. x 10 in. plank, 18 ft. long contains

$\frac{2 \times 10}{12}$ [illegible] B.M.

Why a Plane "Iron" has a "Cap"

More completely than almost anything else are the tools of mechanics free from all superfluous parts, and there is rarely even a variation of their outline but that has material effect on their usefulness, though that effect is not always immediately apparent.

The thing about a plane the reason for which seems



[illegible]

least understood is that—except in a few special forms—the cutting member is made in two parts: the "iron" proper, which does the actual cutting, and the "cap" which is slidably bolted to it. This "cap" is abso-

lutely essential to the accomplishment of the best work with a plane; yet even some joiners do not fully understand its application. Its office is to break the fiber of the shaving, holding it down meanwhile, so that it shall be severed from the wood directly by the cutting edge rather than be torn away by a wedge-like lifting action.

To illustrate roughly, let us suppose that we wish to remove, with a jackknife, a thin sliver from the top of the piece of wood W, in Fig. 1, in which the grain runs in the relative direction indicated by the broken lines. When practicable, of course, we would begin

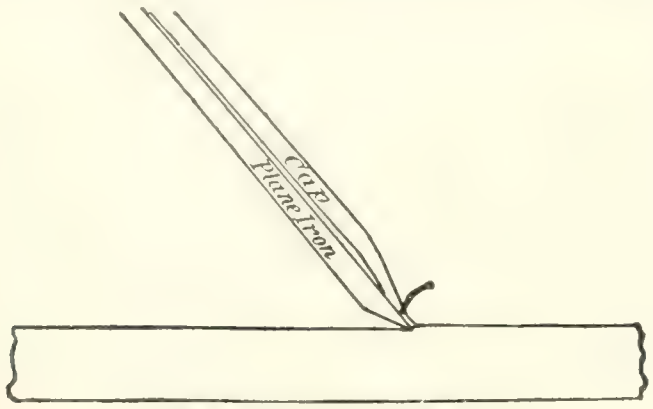


Fig. 2. How the cap breaks the shaving.

the cut at the right, cutting "with the grain"; but in the supposition case we will begin at the left. If we were to press the knife blade directly in from the point A, the split would run a little ahead of the knife edge and follow the grain to F. If, however, we press the blade in a little at a, then tilt it sharply upward, a short piece is broken off. If we now press the blade in a little at b, c, d, etc., breaking off a piece each time, we will eventually have roughly removed a thin layer from A to B. This is essentially what is done by the plane iron and its cap, except that the shaving, being thin, is not broken entirely apart, and being thrust downward when it is broken, it is not pulled away from the wood, but is first severed therefrom by the sharp cutting edge, then thrust away.

The diagram, Fig. 2, illustrates how the shaving, immediately after the cutting edge lifts it, is thrown sharply forward and broken, at the same time being pressed downward, by impinging on the end of the cap. In working hard and cross grained woods the cap is placed very close to the cuting edge, so that the breaks in the fibers of the shaving are very close together indeed. As this necessitates the taking of a correspondingly thin shaving and makes the plane push much harder, it is customary to set the cap farther back in planing softer woods with the grain, or in cases where smoothness is not specially desired. It is essential to good results that the tip of the cap be fitted very snugly against the front of the iron in order that the shavings may not crowd under it.—W. D. Graves in Scientific American.

Securing Various Effects on Wood

Bronze Finishes.—If porous wood is to be finished in bronze, it is first coated with some basic material, leaving the pores open, however, and after drying, brushed with a stiff bristle brush. The bronze and "brunoline" are mixed to a thick paste and rubbed into the pores, removing the excess with a rag covered with oil of turpentine. Instead of brunoline, dissolved beeswax can be used, if the article is to retain a dull finish.

Silver Veins in Wood.—To fasten silver threads, veins, especially German-silved threads, in wood, the metal should never be used without some preliminary treatment. The side of the threads to be in contact with the wood should be roughened with a file and then coated with muriatic acid, or better than that, with garlic. Then it is glued into the wood and will remain there without trouble. The same holds true of brass threads.

Etching.—The wood is coated with concentrated sulphuric acid, and left that way for four to six hours. In this manner, says the "Deutsche Tischler Zeitung," from which these items were translated, the soft annular rings of the wood are burned, leaving the hard rings. The sulphuric acid is now washed off with water and a stiff brush, and the wood will show a beautiful etched appearance which can be stained after the surface has been bleached with chloride of lime or oxalic acid.

Coloring of Wood.—Wood is first coated with the white of egg, which has been thoroughly beaten, then dried and covered with ether. The white of egg coagulates and forms a sort of surface coating which gives a splendid appearance when covered with aniline dyes. Where large quantities of wood have to be treated, a mixture of ether and water, made by violent shaking of the two liquids, can be used, as the ether alone evaporates too quickly.

Coloring Dark Wood Red.—The wood is first bleached by coating it with a mixture of 2 parts chloride of lime, 1½ parts soda and 50 parts water. After this the wood is placed in a bath of water with a trace of sulphuric acid and then washed several times in clear water. If the wood, before staining, is placed into a weak lye bath and then laid into the aniline solution, any coloring from the finest rose to the deepest morocco red can be obtained without trouble.

How to Find Length of Hip Rafters

To get the length of hip rafters, cut on any degree, take its run for one foot, which is always 17 on the tongue of the square, and the rise given the common rafter on the blade. The length from these figures measured across the angle of the steel square will be the length per foot run of the common rafter. These figures on the square also give the seat and plumb cuts of the hip. To get the side cut of the hip take 17 on the tongue and the length of the hip for a one foot run, as described above, on the blade and the blade will give the cut.

The Right Kind of Nails to Use for Various Jobs

Nails are designed with the idea of being used for certain special work, and sizes and styles should be chosen for the special work in hand, if best results are to be obtained.

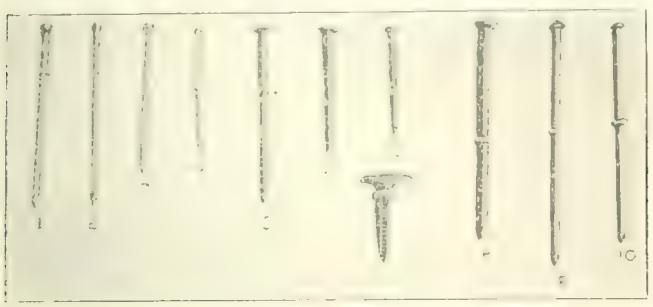
It may be interesting to some builders and carpenters to know that they can improve the quality of their work by selecting the right nails. The writer has seen moulding split and come down as soon as a strain is put on it, and through no other cause than that nails were used which were too long or too coarse a gauge for the purpose. Naturally, the work had to be done over again at cost to the contractor.

There is a nail for almost every purpose for which such an article is required, from the smallest, fine gauge variety to that kind which is well termed "a spike." A few of these are shown in the accompanying illustration. No. 1 is what is known as a 2 in. moulding nail, although why it is called such is a puzzle to many. It is not used for putting up moulding, being too long and too big a gauge. It is used pricipally for finishing work. Nos. 2 and 3 also are moulding nails, the former a 2-in. one of finer gauge than No. 1, and the latter a 1½-in. one. No. 4 is called a finishing nail, and this is used for putting up moulding and fastening hardwood floors in place. Judging by the names of this nail and of the nails really used for finishing, it would appear that nail manufacturers got "twisted" when they named the varieties. If this is not the case, it must be that the kinds known as "moulding" nails came on the market first and came to be known as such, so that when the finer ones now used for moulding and hardwood floors came out, it was deemed inadvisable to change the name of the first nails manufactured.

No. 5 is the general purpose wire nail used for so many different jobs.

No. 6 is a 1½-in. wire nail used for roofing.

No. 7 is made specially for box makers and for one or two other special lines. It is made with a very



A few of the types of nails in common use.

fine point in order that it may take to the wood more easily.

No. 8 is a sample of a barbed nail made up specially for the railways. In the construction of railway cars it is essential that everything be put together as strongly as possible, and the barbed nail is claimed to hold much better than the ordinary kind. It is 2½ in. in length.

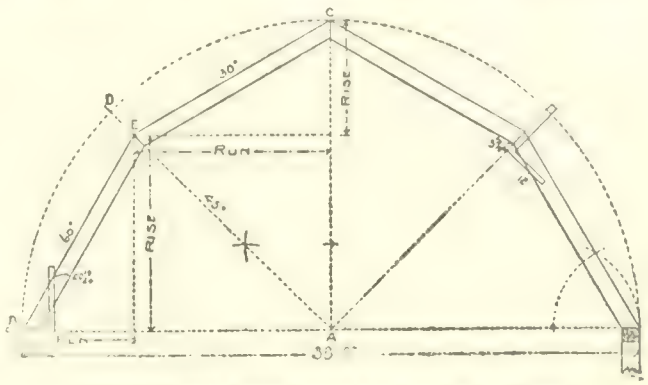
Nos. 9 and 10 are samples of a nail used for fastening metal cornices, metal ceilings and work of a similar nature. It will be seen that these have special heads. No. 9 is known as a cone-head and No. 10 as an oval-head. The object of having these styles of heads is to keep in line with the fancy designs of metal work. They give a neater appearance than the nail with the ordinary head.

No. 11, (the one with the big head) is another type of roofing nail. This nail is not manufactured in Canada, but is imported in large quantities from the United States. It is barbed the full length, and the head is ⅝ in. diameter.

Framing a Gambrel Roof

Question—Would like to know in what proportion to frame a gambrel roof building 38 feet in width and be self-supporting. How high would you make the knuckle joint to be in proportion with the width of the building?

Answer—We show in the accompanying illustration a gambrel roof. In this the knuckle is placed at the half-way point between the plate and the comb, thus making both sets of the rafters the same length and cuts. A roof of this proportion can very easily be laid out with the compass alone, as shown by the diagram.



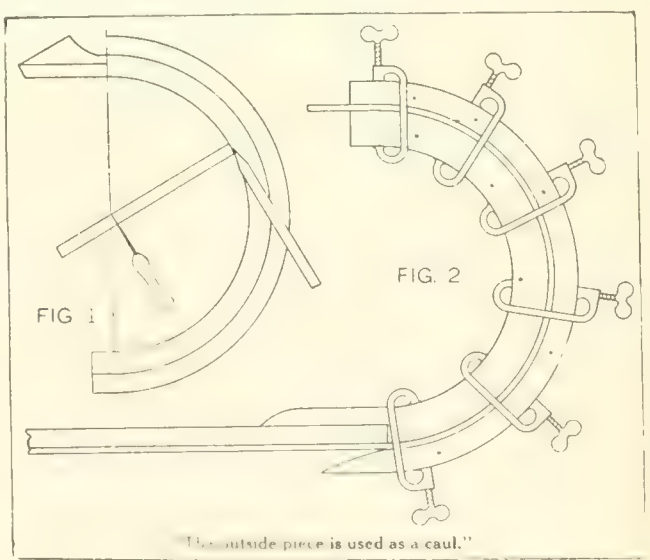
Sketch showing how to frame a gambrel roof building.

A, B represents the total run; A, C the total rise; and are the same as in the half-pitched roof. 12 and 20, 19-24 will give the seat and plumb cuts, while 12 and 3 5-24 will give the cut at the knuckle.

How to Make Circular Risers

In making circular risers, take a thin slat and cut a notch in one end into which to hold a pencil. Take an awl and punch through slat exactly the width of your tread, away from the end. Strike centre with your awl, and, as shown in Fig. 1, mark out circle on a thin board, then mark circle of riser, together with the inside line of core, which ought to be about 1½ ins. in width. Allow 6 or 7 ins. to run out straight from center line; this is later sawed out to receive the straight part of the riser.

You now have a pattern from which to band-saw out your stock for the core, taking care that the horn be



"The outside piece is used as a caul."

of straight grain, to prevent its breaking off under the clamps when veneering. Cants are then glued and nailed together, taking care that nails come near outside edges, so as to not interfere with band-sawing later. After stock has been in the press for a reasonable time, it can be taken out, the pattern tacked on and core band-sawed on the line of the riser. The out-

side piece is used as a caul. The straight part of the riser, which has been veneered separately with veneer long enough to make the circle, is then clamped on the bench core, glued and nailed on, and veneered as shown in Fig. 2.

The veneer should be not over 1/8 in. in thickness. Core should be sawed perfectly round; if not, humps should be dressed out by hand. After veneering set nails in, joint one edge, rip to right width, and you have a neat riser, easily made.—The Woodworker.

A Handy Sliding Pole

The accompanying sketches show the construction of a handy sliding 10-foot pole.

Fig. 1 shows a full length sketch. A and B are pieces 6 feet long by 1 inch square.

Fig. 2 shows how the pieces are fastened together. A, B and C are bands of tin 1 inch wide, the A and B

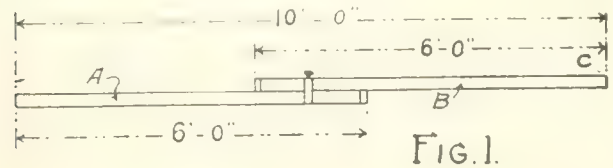


FIG. 1.

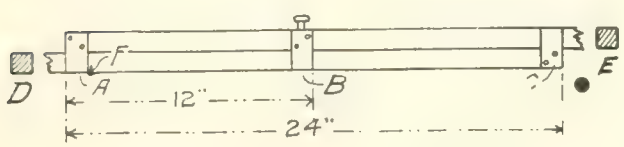


FIG. 2.

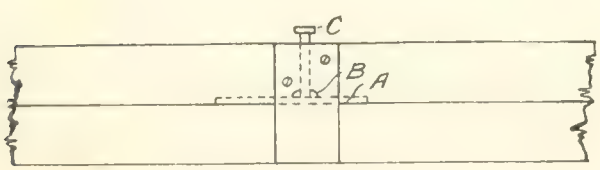


FIG. 3

Arrangement of sliding pole

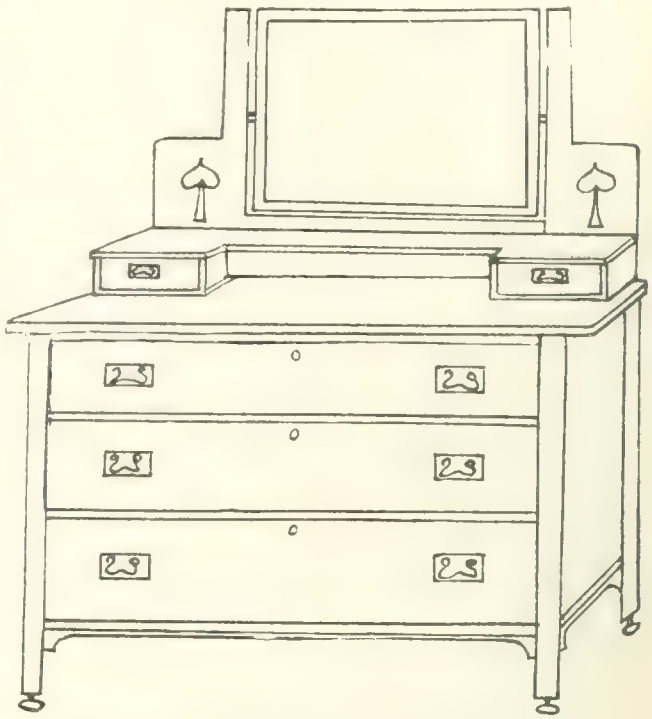
bands are fastened to the lower piece. D and E are end views of the pole, F is a screw set in the lower piece to stop the slide when it is pulled out to the 10-foot mark.

Fig. 3 shows how to clamp the pole when the desired length is taken. A is a piece of file about 2 inches long, which is mortised in the under side of the top piece; B is a nut which is mortised in over the file so as to fit tight; C is a set screw which is screwed in the nut from the top. When ready to clamp, turn set screw which presses the file against lower rod. Begin to number the feet from the C end of the pole, as shown in Fig. 1, and the last foot can be divided in inches.—American Carpenter & Builder.

A Dressing Table Made in Spare Time

This is the slack time for builders and woodworkers, when one finds it difficult to keep busy. Enclosed is a sketch of a dressing table which I made in my spare time last winter. This was made from short pieces of lumber, left over from the buildings, which I picked up and stored away for future use.

Almost anyone can construct it, as it is just plain work with not a moulding on it. The ends are just grooved into the posts, size on the top is 2 ft. x 4 ft.; the small drawers on the top are used for handker-



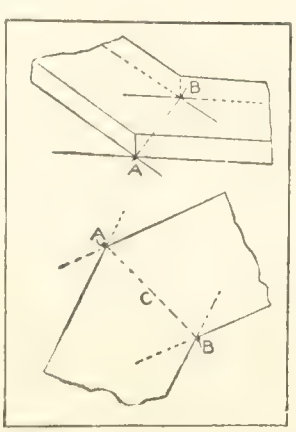
A dressing table which carpenters can easily make in spare time.

chiefs, collars, etc., the shapes in the bracket at the back are sawn through and nicely filed smooth.

When completed I gave it three coats of paint, the finish color being a cross between a grey and a cream, dull finish; the handles were antique copper. The result was a fine piece of furniture fit to place in any house. E. F. C. Busby.

Cutting Mitres

The diagrammatical sketch shows how I cut molding to fit any angle without a miter box. Place a piece of the molding along one surface of the object where it is to be fastened and scribe the outer surface against the ceiling or floor, as the case may be; then place the molding along the other side and scribe a line. While in that position scribe the inner surface of the molding with a sharp knife at the point marked B, also at A, the intersection of the lines scribed on the outer surface of the molding. Connect the two knife marks as shown by the dotted line C, and saw outside of the line about 1-32 in. Cut all the molding before nailing.



In case of a crown molding on a wardrobe, put a temporary top on, letting it project far enough to get the necessary marks, then remove and nail the molding in place. This method will work on any angle.—W. E. G., in Popular Mechanics.

Concrete Department

Concrete Floor in Dairy Barn

The concrete floor illustrated was used in a barn in which two rows of cows stand, heels towards each other, with a driveway between. The same idea could be used for the opposite arrangement. Likewise the method could be used in old and new barns.

Lay out the stalls on 3 ft. 6 in. centres and 4 ft. 6 in. in length from 6 in. manger wall to drop gutter. The manger is 2 ft. 6 in. wide at the top, and 2 ft. at the bottom, with one face sloping up to the feed-alley floor. The depth is 7 in., measured from the stanchion setting, and 8 in. from the alley floor. The feed alley is 4 ft. 6 in. wide. The drop gutter has a width of 18 in. It is 8 in. deep gauged from the stall floor, which is 2 in. higher than the 8 ft. driveway.

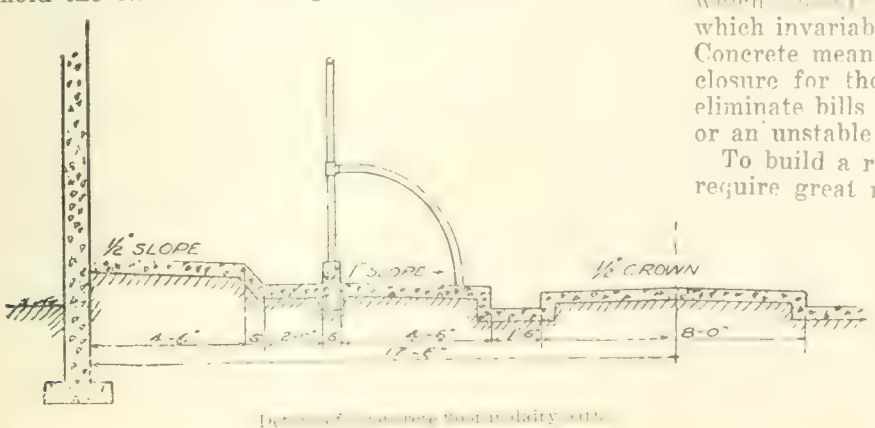
As a foundation for the stall floors proper, place a 6 in. thickness of coarse, broken stone or screened gravel to keep the floor from direct contact with the ground. Since the stall floors are of prime importance, it is well to make them first. Then finish, in order named, the feed alleys, the driveways, the mangers, and lastly the gutters.

For the plan given, 5 ft. 6 in. from the center line of the driveway stake on edge (and to line and grade) a plank 2 in. by 12 in., to serve as a form for the stall floor at the gutter. Likewise set a similar board, 5 ft. distant, to mold the 6 in. manger wall and stanchion setting. Bear in mind that the stall floor has a slope of 1 in. toward the gutter and that the stanchion setting rises 7 in. above the stall floor. Drainage for gutters and mangers will be provided by sloping their concrete bottoms.

Proportion the concrete 1 bag of Portland cement to 2½ cu. ft. of sand and 5 cu. ft. of crushed rock, or 1 bag of cement to 5 cu. ft. of clean pit gravel. At one operation, lay the full 5-in. thickness of the stall floor and finish three stalls the same as one section of sidewalk. No surfacing mortar is needed. For setting patented stall divisions, follow the manufacturer's directions; for home-made divisions, make mortises by tamping the concrete around greased tapering wooden cores, which are withdrawn as soon as the concrete stiffens.

While the concrete of the three stalls is still soft, mold the stanchion setting (6 in. thick) upon it. As forms use the projecting 7 in. height of the 2 in. x 12 in. piece already in place and two boards 1 in. by 6 in. toenailed together so as to provide another 7 in. height and a bearing plate to rest on the green concrete. These forms may be made dish-shaped for swinging stanchions. Fill the forms with wet concrete, trowel the surface, round the corners, and set the stanchion holders. Repeat the operation until all stall floors are completed. The feed alleys and driveway are easily built: they are merely rough-finished sidewalks. Place the waste-water outlets in the mangers at intervals of 28 ft. and give the bottom a slope of 1 in. toward each outlet for a distance of 14 ft. on each side of it. The drop gutters may be drained in like manner or can be sloped slightly in one direction for their full length. For ease in cleaning, round all angles and corners (except at the bottom of the drop gutters) by applying a 1:2 cement-sand mortar immediately after removing the forms.

With the proportions and thicknesses given above, 4 bags (1 barrel) of cement, 10 cu. ft. of sand and 20 cu. ft. of crushed rock will lay 45 to 50 sq. ft. of floor. The usual cost of this material is about $2.50.



Concrete Hydraulic Ram Houses

Among all the small devices used for hoisting or pumping water, few have been more satisfactory than the hydraulic ram, especially where economy of operation has been a factor. To give the best results a ram should be properly installed. This means rigidity of foundation and absence of everything calculated to obstruct the machine while in operation. "Fixing the ram" is an old-time expression familiar to everybody who has had occasion to use this simple and ingenious device. Sometimes the necessity for "fixing" has been brought about by a dislodged stone in the wall, or some obstructing substance in the mechanism.

Concrete affords the best means of protection to the ram, as it is impervious, durable and economical. The accompanying illustration shows a satisfactory type of building. A structure of this character will not rot, even though in constant contact with moisture, which [illegible] destroys wood. There are no joints, which invariably become defects in ordinary masonry. Concrete means a clean, sanitary and satisfactory enclosure for the hydraulic ram, and will do much to eliminate bills for repairs due to improper installation or an unstable foundation.

To build a ram house of the type shown would not require great mechanical skill. Having prepared the pit or foundation and erected his forms, the builder would need to observe the following precautions:

Good cement, clean materials, and the latter used while absolutely fresh. A mixture of 1 part Portland cement, 2 parts sand and 4 parts stone would make a good concrete. The concrete

should be a wet mixture and placed in alternate layers about six inches thick, which should be tamped slightly until water comes to the surface. To obtain a smooth surface the mass should be spaded on the side next to the forms immediately after placing. This is done by working a thin wooden paddle to and fro and up and down between the concrete and the side of the form. A spade will answer where the space between forms is sufficiently wide to permit of its use. The forms should be left in place for at least a week.

The foundation for the ram can be made of the same mixture and if the work is properly done it will mean a rigid, non-vibrating and everlasting base. Time and moisture will only add to its strength and durability.

Avoiding Air Bubbles in Casting Concrete

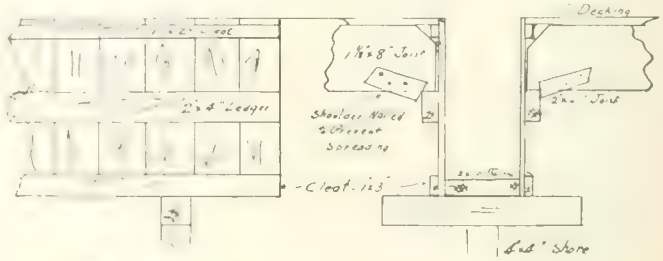
To avoid air bubbles when casting concrete it is necessary to constantly tap or jog the moulds while the concrete is being poured. If, after the moulds have been removed, any defects of this nature are found, they can be removed by rubbing the surfaces with a neat cement. This should be well rubbed in by the use of a brick or a carborundum, emery, concrete or soft natural stone. The work should then be washed down with clean water.

Using Light Lumber for Beam and Girder Sides

Centering economy is an important question in handling concrete, and the results of some experiments in this work conducted by the Carey Construction Co., are told in Concrete-Cement Age. They say:

It is usual practice in floor work to use 1¾-in. timbers for beam-sides. On the work in question we went to the other extreme with considerable success and used ½-in. boards. This sounds extraordinary, but it is true that the light beam-side worked out very well indeed.

In the first place, the centering was designed to develop lumber economy. We would order at the mill 2 in. x 6 ins. and 2 in. x 8 ins. "surfaced both sides," and have them ripped into boards 1⅛ ins. and ½ in. thick, allowing ⅛ in. for the cut and surfacing. On the saw-mill we had on the job the ½ in. stuff was rapidly



Section and elevation of beam sides using light lumber.

cut into short boards 22 in. long, which was the depth of the average beam-side throughout the work. These short boards were framed into beam-sides as shown in the enclosed sketch; ⅞ in. down from the top a 1 in. x 2 in. stringer was run, about midway a 2 in. x 4 in. ledger, and at the bottom a 1 in. x 2 in. stringer. Blocks 2 ins. x 4 ins. were used in between to brace the stringers and to help the 2x4's carry the weight of the joists. A 1⅛-in. material was used for joists and cut off at the top corners as shown.

Using Light Joists

The use of 1⅛ in. material was the result of a careful analysis of the problem. In the first place, when using a 4-in. slab, 20 ins. or 22 ins. is the limit of the distance apart which the joists can be placed, so that the 1-in. sheathing will carry the concrete without sagging. On these centers 1⅛ ins. x 8 ins. and 1⅛ ins. x 6 ins. are plenty heavy enough. We found on the work that the joists being lighter were handled more easily and placed more rapidly. A man could pick up three or four of these and walk out along a beam bottom and drop them into place, where he would not have taken any more than two 2 ins. x 8 ins. joists.

In erection the bottom boards were placed first and supported by shores at the approximate level. These beam-sides were then placed, bolted through the bottom stretcher by a ½-in. bolt which rested on top of the bottom board. This, of course, left a little furrow across the bottom of the girder, which was later covered up by the plaster. If it is not desirable to use bolts, a form clamp can be used just as easily, although the bolts had an advantage in that they held the side units in place. The joists were then placed as shown in the detail. A little 1-in. block was tacked on to the bottom of the joist so as to intercept the 2 in. x 4 in. joists as shown. This helped the beam-sides to withstand any bulging action of the concrete and prevented the end of the joist punching through the ⅛-in. beam-sides.

These beam-sides were used for four floors on the building in question, then were carried to other jobs for other work. As the floors got lighter and shallower on the upper storeys

A concrete hydraulic ram house

supports were placed on top of the shores and the beam bottom carried up inside the beam-side. We attributed the wearing quality of these beam-sides to the fact for one thing that the grain of the wood was carried in two directions. The only wear shown was a brooming of the ends of the ½-in. boards under the concrete. Every once in a while boards would be knocked off or broken, but these, of course, were easily replaced. The beam-sides were light and easily handled. Such a detail, replacing as it does a heavier and more expensive beam-side, merits further consideration.

Concrete Working in Winter

There is only one essential to successful winter concrete work—it must be protected from freezing for 48 hours after it has taken its initial set. If concrete is allowed to harden for 48 hours before freezing, no injury will result, or if it is frozen before the initial set takes place, and then upon thawing has a chance to harden for two days without again being frozen it will be perfectly safe. But if it is frozen and then thaws and freezes again, in a short time it is likely to be damaged. Of course, more care must be taken in the construction of thin walls, columns, floors, etc., than for heavy mass work, as in foundations. In the massive construction, it takes much longer for the cold to take effect and for that reason gives the material a longer time to harden before the temperature gets to the freezing point.

Heating Materials

To keep concrete from freezing, it is generally necessary to heat the materials (not the cement) and then protect the concrete after it has been placed. The equipment necessary for this work will depend on the size of the job. Large jobs permit of the use of more elaborate methods than do small ones. Sand and stone can be successfully heated by means of half cylinders of sheet steel on the ground. The material is piled over them and a fire built under the arch to raise the temperature to about 100 degs. F. More elaborate methods consist in heating the materials in the cars by means of steam pipes or by placing a system of perforated steam pipes on the ground. The sand or stone is then piled over them and the steam allowed to permeate the entire mass.

The water is generally heated by means of a steam coil in a water barrel or by means of special tanks provided for that purpose.

Heating Forms

Before depositing concrete, all snow should be cleaned out of the forms and any ice clinging to them should be removed by means of a steam jet. In very cold weather it is advisable to heat the forms by this means just before placing the concrete. It is also advisable to have the mixing plant as near the building as possible, so that the mixture does not have much chance to get chilled before placing. Forms should be made as tight as possible to prevent cold air coming in contact with the fresh concrete.

Protecting Concrete

If the forms are thick and airtight, it will be sufficient to protect only the top. But in very cold weather the sides should be protected as well. A simple method is to nail heavy building paper to the uprights of the forms, keeping the top and bottom closed, so as to form a confined air-space. In some cases, where there has been great exposure, temporary steam pipes have been attached to the sides. The top is generally covered with a blanket of straw or in the case of floors, light sheathing can be placed about a foot above the concrete and covered with canvas, tarpaulins or building paper.

In building construction, the general method of procedure is to enclose the building with canvas, floor by floor, until the concrete is set, and place salamanders, burning coke, directly underneath all freshly-poured concrete. These salamanders should be kept burning night and day until concrete is thoroughly set. It is considered good practice to keep the interior of the building about 30 degs. above freezing. The tops of freshly-poured concrete floors, which cannot be enclosed by canvas, are often covered with the panels above referred to, or with paper and about twelve inches of hay or straw. The panels are the preferable method, as they can be blocked up more readily six inches or more clear of the floor, allowing for free circulation above the surface of the floor of the warm air below, for the passage of which through the floor, holes are provided at convenient intervals.

Building Construction

Consider a warehouse of the ordinary beam and girder construction with floors of concrete. The materials for the concrete are heated as well as the water. The aggregate are piled directly on perforated steam pipes laid on the ground, allowing the steam to permeate the entire mass. The water is heated by steam coil, an ordinary batch mixer is used, and the concrete conveyed to place by carts.

Just as soon as the forms for the first story columns and the second story floor slabs, beams and girders are completed, and before placing any concrete, the entire building is covered with canvas and the inside heated to about 30 degs. above freezing. If there is any snow or ice on the forms, it is removed with a steam jet. The floor being poured, the upper surface thereof should be covered with wooden panels, canvas, paper, hay or straw, and the temperature must in no case be below freezing.

The next thing is to erect the forms for the wall columns of the next storey above, and this storey is then housed in with canvas. Sufficient canvas should be used to enclose two storeys at a time, and salamanders should be kept burning on each floor during the time the housing is in place. The salamanders should be sprinkled at frequent intervals to produce clouds of steam, and thus prevent too rapid drying out of the concrete. Registering thermometers should also be installed at frequent intervals both beneath and on the surface of the floors.

Silos Erected by the Polk System

The Polk system of erecting silos is to use a centre mast by which the walls of the silo are kept plumb. The centremast is erected in the centre of the silo floor and is guyed to a perpendicular at the top by means of wires and turn buckles. It is a four-inch pipe: provided with a series of traverse openings adapted to receive a key which supports a widely flanged collar, the latter serving to support jacks by which the forms are lifted. Resting upon the jacks is a hub, consisting of a flanged base collar and a top dished collar connected by a central pipe of sufficient bore to work easily over the centremast. On the base collar of the hub radiate T irons which are supported from the upper collar by tension bars. The T irons are rigidly clamped to the top edge of the inner and outer forms, which are made of sheet metal. Each

form is composed of separable sections which have angle iron edges. The separable sections are connected by threaded studs which pass through aligning apertures formed in the opposite angle irons. The outer forms are bolted together and the inner forms carry a wedge between each segment, the lifting of which will allow the forms to swing free.

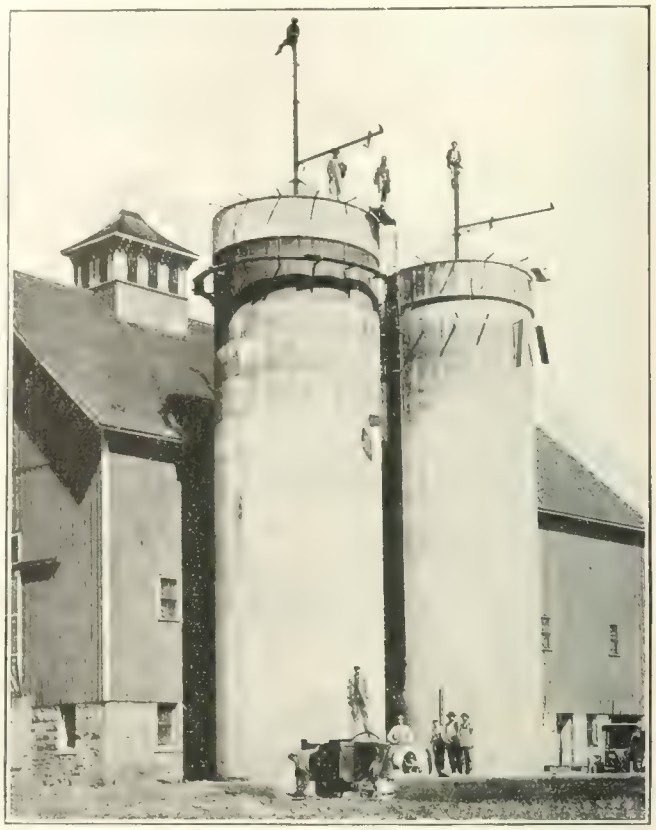
Detachably connected to the outer forms is a series of stanch-irons provided with an inwardly directed overhanging arm, which has an aperture for receiving and retaining vertical, reinforcing rods. These rods, as the building of the wall proceeds, are twined about transversely by horizontal reinforcing. Both inner and outer scaffolding is swung from the radiating T irons.

Filling the Steel Forms With Concrete

For filling in between the forms a V-shaped dumping bucket is provided. It is pivotally supported by a crane above the hub so that it can readily be swung to any part of the wall space. The bucket is hoisted by means of a rope and series of pulleys so arranged that the hoisting force is applied horizontally from without the structure. A small opening is cut in wall at the bottom of the first setting of concrete through which the hoisting rope works. When the bucket is hoisted it is coupled to a carrier on the crane by the means of a hinged hook.

The operation of the machine is simple. The forms are set, the re-enforcing bars arranged, the concrete is mixed, hoisted, dumped and packed between the forms, and allowed to set. On the next morning the nuts connecting the separable sections of the forms are loosened and the forms swing free from the wall. Then by means of the jacks the whole mechanism is lifted until in a position for a new "fill" when the forms are again tightened. The raising of the forms for a set of 3 feet 10 inches does not require more than ten minutes' work. It takes three men only fourteen days to build a 16 x 40 silo, everything complete. This includes excavating, erecting, taking down and cleaning machine.

This system of erecting monolithic concrete silos is designed by Polk-Genung-Polk Co., Fort Branch, Ind., U.S.A.



Monolithic twin silos, 16 ft. x 60 ft., built by the Polk System, showing two Polk machines in operation.

...erected by the Polk system of Polk Genung-Polk Co., Fort Branch, Ind. It is 16 ft. x 45 ft.. This picture was taken after a cyclone which destroyed 81 barns, leaving the silo standing.

Brick Work and Plastering

Metal Ties for Bonds

Where pressed bricks, or other bricks for that matter, are used in connection with bakup hollow tile, or as a finish for common brickwork, they are commonly run as a separate veneer course, and bonded to the bakup blocks or bricks at certain intervals. The bonding may be done by means of concealed or blind headers, but more commonly is done by means of metal ties. A common form of metal tie is shown in Fig. 1. It is simply a strip of sheet metal, generally galvanized, and crimped or corrugated in herringbone fashion to give it a better

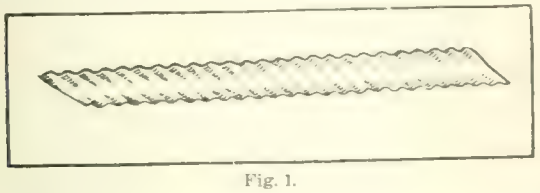


Fig. 1.

grip or hold in the wall. Half of the strip is bedded in the face brick, as shown in Fig. 2, and half of it in the bakup blocks or rough brickwork, thereby tying the two layers of materials together.

Another form of wall tie is shown in Fig 3. In this

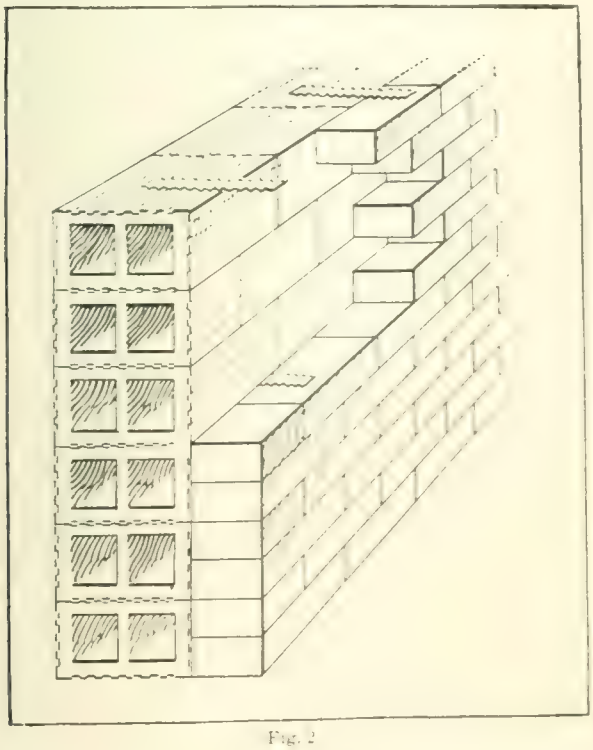


Fig. 2

wire wall tie the loop at the ends performs the function of ridges pressed in the flat metal ties, in giving a good grip to the embedded metal. This tie, it will be noticed, has a peculiar construction at A, A, which is not without interest. Many walls are laid up with an air space of a couple of inches between the outer face course of the bricks and the inner body of the wall. To insulate the building and prevent the passage of heat or moisture. In most cases, whether an air space is intended or not, there is more or less space there, and moisture condensing inside, or passing through from the outside, will follow along the metal ties to the in-

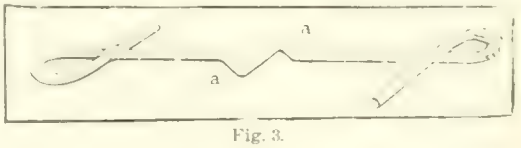


Fig. 3.

terior of the building. To prevent such passage of moisture, the little humps or "drips" A, A are made on the wire ties, so that any moisture gathering thereon will be conducted to the bottom of the downward hump, where it will form a drop and fall by the force of gravity to the bottom of the space. The value of the double hump lies in the fact that whichever way the wire tie is used, one hump will be down.

The method of using the tie is shown in Fig. 4, which illustrates a wall made up of three vertical layers of brick with a hollow space between two of the layers. The single layer in a wall of this description is of but little use as a portion of the wall for bearing the weight

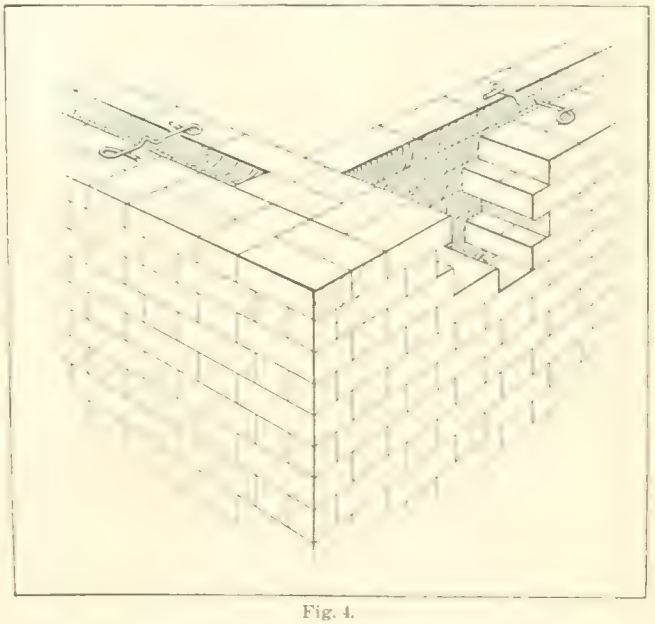


Fig. 4.

of the building, and is not considered in that light. With a brick veneer facing a bakup course of hollow tile, on the other hand, the veneer of brick lies snugly against the bakup tile, and being tied together these form one common wall, all parts of which are of equal value for bearing surface.

Metal ties are used in veneer work, likewise, where a layer of brick is laid outside of the framework of a building to give to the structure the appearance of being built of masonry. For veneer work in cold climates the studding is sheathed outside and plastered

on the inside, while in warm parts of the country the sheathing is omitted and the bricks are laid along the face of the studding. A metal tie used as a veneer tie is shown in Fig. 5. The staple portion driven into the sheathing or studding, as the case may be, holds the tie fast in place, and the loop on the end of the tie when bedded in the brickwork secures the veneer to the wall. The brick veneer is merely a curtain wall, however, not a bearing wall, the weight of the wall being carried by the framework. It is a question

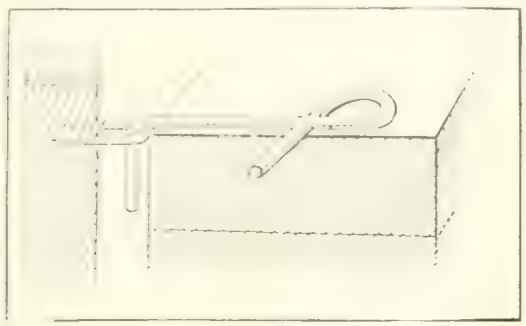


Fig. 5.

whether such a building is any cheaper to build than one of hollow tile walls, and, as it is not fireproof, as tile or brick walls would be, it is hard to see where the logic of such construction is to be found.—Building Progress.

Anchoring
Stone and Terra Cotta to Concrete

A method, used by the writer, for anchoring terra cotta and stone veneer to concrete has proven its worth. For an example, if we wish to provide anchors for a belt course of terra cotta around the walls of a building, we place a ½-in. or ⅜-in. rod horizontally about 2½ in. above the terra cotta around the entire building where the belt course is to be placed,, setting the rod in the form so that it will be almost flush with the surface, and place wire anchors of No. 9 wire around the rod into the concrete at intervals of about 12 in. To anchor a block of terra cotta the mason simply cuts or gouges a hole around the rod, as shown in Fig. 1, and fastens the terra cotta anchor to it.

The benefits derived from using this method are, first, that the superintendent does not have to worry and take pains to set a number of separate anchors, taking chances in not having the anchors just right to meet the anchor holes in the terra cotta; second, this method saves considerable labor.

Another "kink" used by the writer is in setting bolts after concrete is in place. Instead of drilling a cylindrical hole, the hole is drilled so as to make it slightly larger inside, forming a dove-tail. The bolt is then set with slight upset on its end and grouted in. This is shown in Fig. 2.—Concrete Cement Age.

General
Specifications and Instructions for Setting Tiles

By F. W. Wakler

These "General specifications and instructions" are presented herewith for the purpose of improving tile work, and bringing the standard up to a more uniform basis. The details have been most carefully prepared.

Foundation for Floors. A good foundation is always necessary, and should be solid and perfectly level, free from spring or vibration. Tile must always be laid upon a concrete foundation, prepared from the best quality Portland cement and clean, sharp, washed sand and gravel.

Cinders should never be used, as they tend to destroy the life of cement, but if used, all ashes must be screened out and the vitrified cinder or clinker thoroughly washed. (The sulphur in cinders will destroy reinforcing in concrete.)

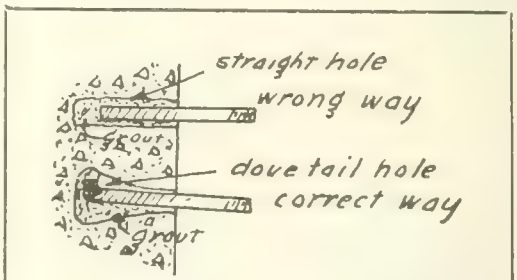
Concrete should be allowed to thoroughly harden before laying floor; thoroughly brushed to remove all dust; well-soaked with water, dusting on concrete thin coat pure Portland cement before applying cement mortar for laying tile.

Concrete should never be allowed to stand more than three or four days before laying the tile.

Lime mortar should never be mixed with concrete.

Concrete should consist of one part Portland cement, two parts clean, washed, sharp sand, four parts clean gravel.

Mix cement and sand thoroughly dry, add gravel and mix, adding sufficient water to form, when laid,

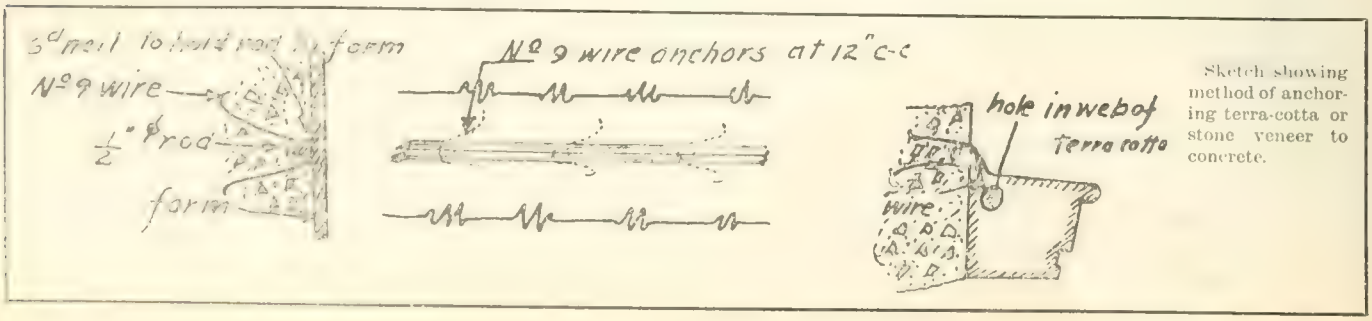


Sketch showing incorrect and correct method for anchoring bolts in old concrete.

a hard, solid mass when well beaten to a bed. Bed should be not less than three inches thick. Surface of concrete must be level and finished to within one inch of finished floor line (when tile ½ inch thick is use), which will leave space of ½ inch for cement mortar.

Cement mortar should consist of one part best quality Portland cement, two parts clean, washed, sharp sand, thoroughly mixed as directed for concrete. All

[1]Secretary, Associated Tile Manufacturers.



Sketch showing method of anchoring terra-cotta or stone veneer to concrete.

mortar should be used fresh, before it has its initial setting.

Reinforcing. Place on top of the concrete an open metal lath and spread the cement mortar over it. This will prevent the tendency to contraction of the cement mortar and separation of the tile into floor cracks.

Before laying tile, sprinkle carefully with fine hand screen a little dry cement over floor on top of cement mortar.

Grouting. Joints to be grouted with pure Portland cement, mixed with clear water, cleaned soon as grouting is done, leaving no cement scum on surface.

Floors in new buildings. When tiles are laid on joists in new buildings, if possible, joists should

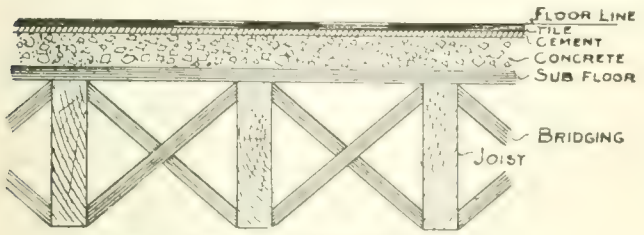


Fig. 1. Tile flooring laid in new building.

be set five inches below intended finished floor line, spaced 12 inches on centres, thoroughly bridged, to make stiff floor, covered with one-inch rough boards not over six inches wide (three inches preferred), thoroughly nailed, and joints ⅛ inch apart to allow for swelling (see Fig. 1).

A layer of roofing paper on top of rough floor will protect boards from moisture of concrete, and prevent moisture from dripping through to ceiling below.

Floors in old buildings. Cleats are nailed to joists five inches below intended finished floor line, and short pieces of boards (not over six inches wide), ⅛ inch apart, fitted in between joists upon cleats and well nailed. Joists must be thoroughly bridged. Place roof paper as above directed. Corners on the upper edge of joists should be chamfered off to sharp point (see Fig. 2), as flat surface of joists will give uneven foundation. When strength of joists will permit, cut an inch or more off top. Where joists are too weak, strengthen by thoroughly nailing cleats six inches wide full length of joists.

When solid sub-foundation is thus prepared, concrete is placed upon it as above directed.

Iron beams. Where iron beams and hollow tile arches are used, frequently very little space is left for preparing proper foundation for setting tile. The

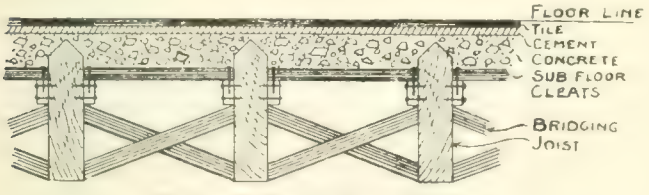


Fig. 2. Tile floor laid in old building.

rough coat is usually put in by hollow tile contractor to protect his work. This cover should always conform to requirements for a solid tile foundation. Should this not be the case, the tile contractor must remove sufficient of covering to allow him to put down a foundation that will insure a satisfactory tile floor. Cinders, lime, mortar or inferior material must never be used.

The tops of iron beams should be three inches below the finished floor line to prevent floors showing lines on the beams (see Fig. 3).

Convention of Frontier Mason Builders' Assn.

The Fifth Annual Convention of the Frontier Mason Builders' Association was held at the King Edward Hotel, Toronto, Dec. 3 and 4. Delegates to the number of 50 were present from Cleveland, Detroit, Buffalo, Rochester, Milwaukee, Hamilton, London, St. Catharines and Toronto.

A sad incident of the convention was the death of Mrs. John Aldridge, wife of the president of the association, who passed away on the morning of Dec. 3. On motion, a deputation was appointed to express to Mr. Aldridge, the sympathy of the association in his bereavement.

In the absence of president Aldridge, Mr. Wm. N. Friederichs, of Rochester, vice-president of the F. M. B. A., was master of ceremonies.

At the opening session the delegates were officially welcomed to Toronto by Mayor Hocken. The reports of the officers and committees were received, and Messrs. Griffin, of Cleveland, Carter, of Buffalo, Hickey, of Detroit, and a representative from London, Ont., gave brief outlines on the general working and wage conditions in the building trades in their respective cities, and stated it was their opinion that there would be little, if any, increase in wages during 1914.

After the opening session the delegates were entertained at complimentary lunch by the Mayor and the City Council at the Grand Union Hotel.

The problem of workmen's compensation and the various State laws upon the subject was under consideration during the afternoon of the first day. Counsel for the Canadian Manufacturers' Association, Mr. F. W. Wegenast, gave a report of the conditions in

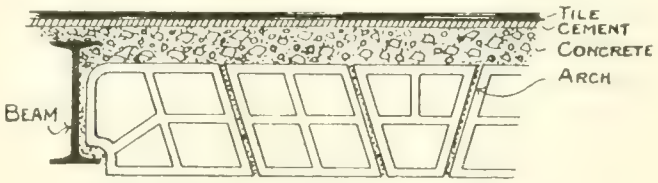


Fig. 3. Tile floor over iron beams and tiles.

this province regarding the laws to be enacted. More regarding his remarks will appear in an early issue. Briefly, the scheme as proposed by Mr. Wegenast is that all manufacturers of a certain line, say furniture, be grouped together and assessed according to their respective pay rolls, thus creating a fund from which workmen are compensated when injured. The rate of assessment varies according to the different lines of manufacturing, those where risks are greater of course, being taxed more. The building trades would be grouped in the same way, but there would be a schedule of rates, i.e., the assessment on strucural iron working firms would be higher than that on stonecutters on account of the greater risk. The rates on the building trades in the State of Washington, where a workman's compensation law has been in effect for some time, are fair, and it is likely that if the scheme goes through in Ontario, the taxations will be about the same.

Mr. Otto Misch, president of the Master Masons' Association of Detroit, gave a synopsis of the working of the Michigan Employees' Compensation Act, and outlined the various injuries for which workmen received compensation, and how much was paid. Under the Michigan law an employee receives nothing for the first two weeks after his injury.

Mr. Wm. Kroemug, Milwaukee, spoke on the law in force in Wisconsin.

The Second Day

At the final session the delegates discussed the matter

of remuneration for unaccepted bids, and a committee was appointed to go into the matter and report at the annual meeting next year. In the meantime it was decided that the secretaries of the builders' exchanges should approach the architects and ask that a set of plans of each job be deposited in the exchange, to be kept until the job is finished. This will enable interested persons to see that the plans have not been altered.

Officers were elected as follows: President, William M. Friederichs, Rochester; first vice-president, Henry Schmidt, Milwaukee; second vice-president, William Felton, Buffalo; secretary-treasurer, William Doud, Detroit.

The Lighter Side

The entertainment committee and the members of the Toronto Builders' Exchange certainly acquitted themselves nobly in the royal manner in which they entertained the visiting delegates. "The best ever" was the expression of all those in attendance. In the evening of the first day of the convention, a theatre party was held at Shea's Theatre, after which the various clubs in the city were visited. On Thursday afternoon, the members of the Toronto Exchange placed their motor cars at the disposal of the committee, and the delegates were taken for a drive around the city. All principal points of interest were visited, but what took the eye of the cousins from across the border was the stone and masonry work in, and the general lay-out of, the magnificent castle of Sir Henry M. Pellatt and the new St. Paul's Cathedral.

The event that topped everything, however, was the banquet in the King Edward Hotel on Thursday night. The menu was excellent and the same must be said of the talent who assisted. The wise and witty Fred Armstrong, Toronto, was toastmaster. Among the after-dinner speakers were W. R. Brock, president of the Toronto Board of Trade, Major A. T. Hunter, J. N. Carter, Acton Bond, representing the architects, president Friederichs, secretary Doud and Messrs. Bowen and Kroemug.

The following comprised the talent that made the evening a musical one: Messrs. Stewart Brennan, J. Hayes, Bert Harvey, W. Self, Marley Sherris, and Ernie Bowles, accompanist.

Big Convention at Louisville, Ky., in January

The convention of the National Association of Builders' Exchanges of Canada and the United States will be held in Louisville, Ky., Jan. 21, 22 and 23, and in connection with this an invitation has been sent to the different secretaries to attend a convention of their own on the two days preceeding the big one. The Builders' Bulletin of the Montreal Exchange is advocating a similar scheme in connection with the coming Canadian National Convention and states it would be a good plan for the Canadian Convention to be held later than usual in order that those Canadian secretaries who go to Louisville may take part in the debates there, and relate their experiences at the Canadian meetings.

Masons Favor Compensation Bill

The Ontario bricklayers and stonemasons at their convention in St. Catharines declared unanimously in favor of the workmen's compensation bill, as prepared by Sir William Meredith. The matter came before the convention as a recommendation in a report of the Committee for the General Good, against which not one voice was raised.

The conference also decided to assess each individual member in Ontario five cents for the creation of a fund which will be used in financing the representing of every union in the province at the annual meetings of the international convention.

New Office for Vancouver Builders' Exchange

The Builders' Exchange, which was recently organized at Vancouver, B.C., has opened offices in the Fairview Building, occupying rooms No. 45 and 46. It is the intention to have in the near future an entire floor in some building where the exchange can establish a permanent exhibition of builders' supplies. The officers which have been elected are:

President—A. K. Bentley
Vice-President—William O. Marble
Secretary—W. H. Lindsay
Treasurer—H. N. Boultbee.

The officials have in mind the establishment in the near future of a 'Change hour, and other steps will be taken to place the organization upon a substantial and progressive basis.

Canadian National Association of Builders' Exchanges

WESTERN DISTRICT

President—W. J. Davidson, Winnipeg, Man.
1st Vice-President—G. Silvester, Calgary, Alta.
2nd Vice-President—W. A. Wilson, Regina, Sask.
Secretary-Treasurer—A. M. Rose, Winnipeg, Man.

City **Secretary and Address**

Brandon, Man.—E. P. Fuller, Suite 1, Northern Crown Bank.
Dauphin, Man.—E. N. Hyland, General P. O.
Winnipeg, Man.—A. M. Rose, Builders' Exchange Bldg.
Moose Jaw, Sask.—[illegible], 16 Ferguson Block.
Regina, Sask.—Geo. Powell, 206 Kerr Block.
Saskatoon, Sask.—Maurice R. Prout, Oddfellows' Temple, 21st Street East.
Swift Current, Sask.—Jno. McIntosh, Box 268.
Calgary, Alta.—F. C. Rankine, General P. O.
Edmonton, Alta.—A. O. Wetmore, McDougall Court.
Lethbridge, Alta.—Wm. Walker, 405 Sherlock Bldg.
Medicine Hat, Alta.—Chas. E. Dyce, General P. O.
Vancouver, B.C.—W. Hamilton-Lindsay, Box 45.
Victoria.—D. B. Plunkett, 503 Union Bank Bldg.
Prince Albert, Sask.—Jno. R. Davidson, General P.O.
Sault Ste. Marie.—MacPhail & Wright Cons. Co., P.O. Box 835.

EASTERN DISTRICT

President—Geo. Gander, Toronto.
1st Vice-President—L. H. Martyn, London.
2nd Vice-President—Jas. Ballantyne, Montreal.
Secretary-Treasurer—P. L. Fraser, Toronto.

Brantford.—A. J. Cromar, 103½ Dalhousie St., P.O. Box 212. 58 Granville Street.
Chatham.—S. G. Kinsey, 14 Fifth St.
Guelph.—Mahoney Bros., General P. O.
Hamilton.—A. Heatley, 325 Chancery Chambers, Main Street East.
Kingston.—E. R. Beckwith, C. E., 292 Earl Street.
London, Ont.—Fred. S. Barclay, Builders' Exchange.
Ottawa.—J. S. C. Adamson, 126 Sparks Street.
[illegible]
St. Catharines.—Thomas Mesler, General P. O.
St. Thomas.—E. O. Penwarden, 1 White St.
Toronto.—A. E. Flower, 2 Berti Street.
Windsor.—A. E. Paddon, 163 Louis Ave.
Montreal.—R. L. Werry, 263 St. James Street.
Quebec.—A. Cote, 23 Rue St. Jean.
Halifax, N.S.—H. Roper, care of S. M. Brookfield, Limited.
St. John, N.B.—Charles F. Stevens, Builders' Exchange.

New Equipment

A New Surface Sander

The accompanying illustration shows a new surface sander that is specially adapted to hardwood trim or any work of that nature. It will finish any piece of wood up to 12 inches in width. The important feature of this machine is that the cylinder is mounted on a pair of hanging arms, with an adjustable spring, which

Surface sander manufactured by W. A. Elliot, Toronto.

precludes the possibility of the cylinder being clogged by too heavy a cut. It is perfectly balanced, and the material rests flat on the bed, ensuring a perfect finish.

This sander is the product of W. A. Elliot, Toronto; and if desired can be run from the Elliot woodworker.

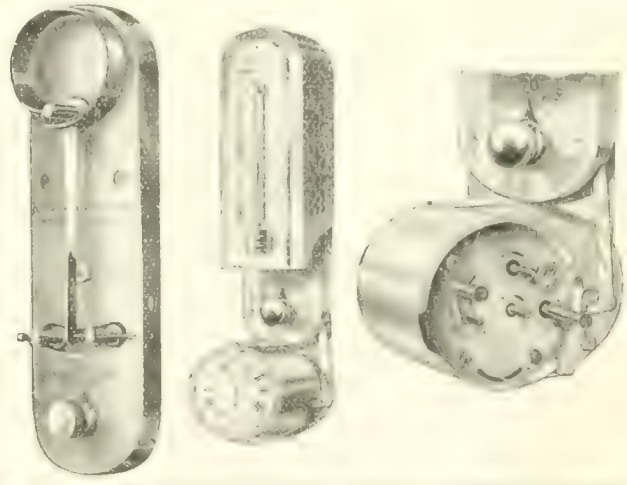
Heat Regulator for House Heating

The accompanying illustration shows a thermostat or mechanical thermometer for use in houses. It can be attached to any furnace or boiler and raises or lowers the drafts on the furnace automatically on a change of only two degrees in temperature.

The thermometer consists of a metal coil made of two metals welded together, one being more sensitive to heat and cold than the other. An arm is attached to this coil, and as the coil expands and contracts with the heat or cold, the movement is imparted to this arm, which plays back and forth between two platinum points. A three strand wire is attached to this mechanical thermometer, which is placed in the living room, and as the pointer touches one or the other of these points, it closes the electric circuit just long enough to get a spark from two dry cells, which are connected to the thermostat by the wire. This spark passes through an armature and releases a brake, which is holding a spring. As the brake is released, the spring operates and the arms of the motor make a half revolution, raising the front draft and closing the check, or vice versa.

The thermostat is protected by a brush brass screen upon which is mounted an accurate thermometer. The motor, which is located in the basement, is made entirely of brass and steel and is enclosed in a dust proof case.

The thermostat is also equipped with a reliable clock which makes it possible to change the temperature at any predetermined time, for example, upon retiring at night, the indicator can be set for 60, which guarantees that the temperature will be between 59 and 61 all night. By setting the alarm for instance at 7 a.m., the alarm, instead of waking you, will automatically and silently move the pointer from 60 to 70 and at the same time raising the drafts and starting the fire, thus heating the house up to 70 before you get up at 8 a.m. Should the temperature raise to 71 before you get up,



Minneapolis heat regulator, for which Harvey A. Warner, 69 Yonge St. Arcade, Toronto, is sales agent.

the thermostat will automatically check the fire and control it for the balance of the day without further adjustment.

Scroll Saw and Floor Sander With New Improvements

W. A. Elliot, Toronto, has added improvements to two of his machines. The Elliot scroll saw is now being made with a square top instead of a round one, which gives more working room for the operator and improves the appearance of the machine.

To the floor sander has been added a new brush for waxing floors. It is a simple operation to remove the sandpaper drum and replace it with the brush drum for waxing and polishing.

American Precision Saw and Mitre Gauges

The mitre gauges that have been added to the American precision saw are neat in design and easily handled by an operator. They are graduated on the segment

in degrees so that any angle may be obtained instantly. The ripping fence bevels and may be set at an angle to the plane of the saw, and there are graduations in the table for quickly setting the fence without the aid of a rule.

The table itself tilts to an angle of 45 degrees and is self-locking. The saw arbor runs on ball bearings and carries a saw that is equally adaptable to ripping or cross cutting. The throat plate around the saw is removable so that dado or jointing heads may be employed. At the back of the machine may be applied either a boring or mortising attachment.

The adaptability of this machine for either ripping or cross-cutting without changing saws gives it the character of a universal machine. It will rip material 22½ in. wide and cross-cut to 24 in. Saws up to 14 in. in diameter may be used.

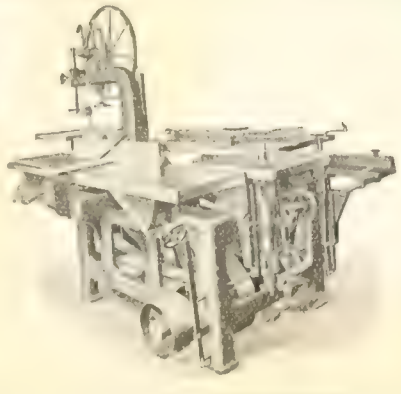
The table tilts upward from right hand to 45 degs. by handwheel, and works and locks at any angle. The table is provided with rip, cut-off and mitre gauges; rip gauge may be used on either side of saw and the table is sealed its entire width. The rip gauge has bevel and swivel adjustments. The mitre gauges are graduated in degrees on their beveled edge and have accurate taper pin stops for all principal angles; for intermediate angles a clamp wheel is used.

Attachments that may be had with this machine are safety saw guard, boring attachment, mortising attachment and self-centreing chuck.

The machine is manufactured by the American Wood Working Machinery Co., Rochester, N.Y., and sold in Canada by the American Wood Working Machinery Co., 152 Bay street, Toronto, and the Stuart Machinery Co., Winnipeg, the latter having the selling rights in Canada west of Port Arthur and Fort William.

Sidney Universal Woodworker

To make a profit to-day, a carpenter, builder or any other worker in wood must have an equipment of up-to-date equipment and tools. The builder thus supplied with machinery is able to meet competition,



Woodworking machine being placed on the Canadian market by the Sidney Tool Co., P.O. Box 123, Sidney, Ohio.

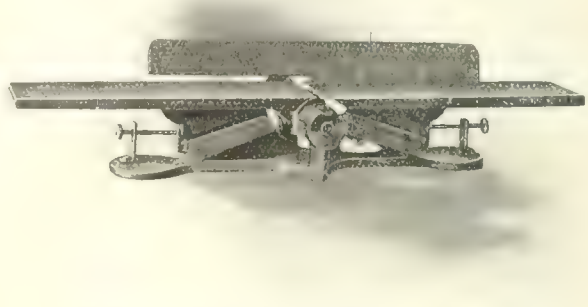
eliminate delays, get work out on time and also greatly increase his profit.

One of the most efficient tools used by the carpenter and builder is the universal woodworker. The illustration shows the one being placed on the Canadian market by the Sidney Tool Co., Box 123, Sidney, Ohio. This woodworker may be operated by an electric motor or a gasoline engine with as low as 5 horse-power. This machine comprises a band saw; a jointer with removable head to admit of using special heads, sounding drum, etc.; a combination rip and cut-off saw table arranged for dadoing and other kinds of work; a reversible shaper, a boring and hollow-chisel mortising machine.

As such a machine is self-contained, very little or no expense is required for shafting, pulleys and belts. The floor space required for the Sidney Universal Woodworker is about 5 x 7 ft. or 6 x 8 ft., and not exceeding 50 sq. ft.

New Bench Jointer

Herewith is shown a new 6-inch bench jointer, recently patented by W. A. Elliot, Toronto. This machine has two cutting knives and is built to take a 6-inch cut of ⅛-inch hardwood. Some of its valuable features are: the throat is narrow, which permits of a short piece of wood being jointed off without injury to the operator: the bed is adjustable from both back and front, so that it can be set instantly for any depth



New 6 inch bench jointer manufactured and sold by W. A. Elliot, Toronto.

of cut; the fence also is adjustable, and this makes it possible to bevel from 90 to 45 degrees.

The machine can be used for edging, for dressing up a small job, for bevelling hand rails or casing for bay windows.

Any kind of power can be used to operate this bench jointer.

Alterations at Offices of Toronto Builders' Exchange

The offices of the Toronto Builders' Exchange have undergone a thorough renovation. The secretary's office has been partitioned off and put into good order. The walls have been covered with burlap, panelled, and painted and decorated in the newest style.

Montreal Exchange Discusses Workmen's Compensation Law

At one of the recent luncheons of the Montreal Builders' Exchange, Messrs. R. L. Calder, John Quinland, and H. T. Meldrum, secretary of the Canadian Manufacturers' Association, gave interesting addresses on the Workmen's Compensation Law. Mr. Quinlan stated that he thought the new system of state insurance, now being devised for Ontario, was far superior to the present law.

Price List of Building Materials—Revised to Date

PRICE AT MONTREAL

Hemlock Lumber

2 x 4 in. to 2 x 12 in., 8 to 14 ft	$24.00
2 x 4 in. to 2 x 12 in., 16 ft.	26.00
2 x 4 in. to 2 x 12 in., 18 ft.	28.00 to 30.00
1 in. hemlock No. 1	22.00
No. 1 hemlock decking	23.00 to 25.00
No. 2 hemlock dimensions and 1 in.	26.00 to 30.00

Pine

1 in. common and better pine 8 to 12 in. wide, rough	$32.00 to 40.00
2 in. white pine, mill stock	29.00 to 33.00
⅞ x 8 and 10 in. pine shelving	36.00 to 45.00
⅞ x 12 pine shelving	42.00 to 50.00
No. 1 white pine flooring	40.00
No. 1 spruce flooring	30.00
No. 1 pine decking, D2S	40.00
No. 1 pine V. or beaded sheeting	40.00
No. 2 pine V. or beaded sheeting	30.00

Pine Trim for Paint Finish

4 in. casing, per 100 ft.	$1.75
5 in. casing, per 100 ft.	2.10
8 in. pine base, per 100 ft.	3.25
10 in. pine base, per 100 ft.	4.20
4 in. pine window stool, per 100 ft.	2.75

Shingles, Lath Roofing, Etc.

No. 1 pine lath	5.00
No. 2 pine lath	4.50
No. 1 spruce lath	4.00

Cedar Posts—Fence

5 in. at small end	5c. foot
7 in. at small end	7c. foot

Hardware

Nails, wire, common	$2.30 base keg
Nails, cut, common	2.50 " "
Sash weights, cast iron	1.50 per 100 lbs.
Tarred felt paper	.43 roll
Building paper	.35 roll

Brick, Tile, Terra Cotta, Sewer Pipe

No. 1 dry pressed red bricks	18.00
No. 1 dry pressed buff bricks	20.50
Red stock bricks	11.50
Grey stock bricks	12.00
Wire cut brick for foundation work	10.00
Fire brick	25.00
Sewer pipe, 4 inch	10c. foot
Sewer pipe, 6 inch	15c. foot

Cement, Plaster, Stone, Etc.

Cement (bags extra)	1.85 bbl.
Sand, for cement or brick work	1.15 ton
Lime	.30 per 100 lbs.
Hydrated lime	10.00
Mortar color	5.00 bbl.
Plaster of paris	3.00
Crushed stone, 2 in.	1.50
Crushed stone, 1 in.	1.60
Crushed stone, ⅜ in.	1.75
Hardwall plaster	$9.50 to 12.00 neat
	6.50 sanded ton
Gravel	1.85 yard
Hair (plaster)	.03 per lb.

PRICE AT TORONTO

Hemlock Lumber

2 x 4 in. to 2 x 12 in., 8 to 14 ft.	$25.00 to 29.00
2 x 4 in. to 2 x 12 in., 16 ft.	25.00 to 29.00
2 x 4 in. to 2 x 12 in., 18 ft.	28.00 to 30.00
1 in. hemlock No. 1	25.00 to 28.00
No. 1 hemlock decking	26.00 to 29.00
No. 2 hemlock dimensions and 1 in.	21.00 to 24.00

Price at Toronto—*Continued*

Pine

1 in. common and better pine 8 to 12 in. wide, rough	$28.00 to 35.00
2 in. white pine, mill stock	29.00 to 34.00
⅞ x 8 and 10 in. pine shelving	36.00 to 40.00
⅞ x 12 pine shelving	45.00 to 48.00
No. 1 white pine flooring	33.00 to 37.00
No. 1 spruce flooring	27.00 to 32.00
No. 1 pine decking, D2S	28.00 to 33.00
Spruce decking	27.00 to 32.00
No. 1 pine V. or beaded sheeting	35.00 to 39.00
No. 2 pine V. or beaded sheeting	30.00 to 33.00

No. 1 Common Yellow Pine

2 x 4 in. to 2 x 14 in., 10 to 16 ft.	$30.00 to 32.00
2 x 4 in. to 2 x 14 in., 18 to 20 ft.	32.00 to 34.50
2 x 4 in. to 2 x 14 in., 22 to 24 ft.	37.00

Yellow Pine Finish

4/4 x 6, 8, 10 and 12 B. & B. steam finish	$41.00
5/4 x " " " "	45.00
6/4 x " " " "	45.00
8/4 x " " " "	45.00
4/4 x " " " smoke finish	48.00 to 50.00
5/4 x " " " "	48.00 to 50.00
6/4 x " " " "	48.00 to 50.00
8/4 x " " " "	50.00 to 55.00

Pine Trim for Paint Finish

4 in. casing, per 100 ft.	$1.80 to 2.00
5 in. casing, per 100 ft.	2.00 to 2.50
8 in. pine base, per 100 ft.	2.75 to 3.25
10 in. pine base, per 100 ft.	4.00 to 4.50
4 in. pine window stool, per 100 ft.	3.00

Shingles, Lath Roofing Etc.

XXX B. C. cedar shingles	$3.60 to 4.00 per M
N. B. extras	4.00 to 4.40
No. 1 pine lath	5.00 to 5.50 per M
No. 2 pine lath	4.75 to 5.00
No. 1 spruce lath	4.50
Roofing felt (2 ply)	1 ply--$1.60 per sq.
	2 ply— 2.00 "
	3 ply 2.40 "

Cedar Posts—Fence

5 in. at small end	.25 each
7 in. at small end	.50 each

Hardware

Nails, wire, common	$2.35 cwt.
Nails, cut, common	2.95
Sash weights, cast iron	1.75
Tarred felt paper	.65 roll
Building paper	.45

Glass

United inches	Star	D.D.
Up 25	$4.25	6.25
26-40	4.65	6.75
41-50	5.10	7.50
51-60	5.35	8.50
61-70	5.75	9.75
71-80	6.25	11.00
81-85	7 00	12.50
86-90	7.75	15.00
91-95		17.50
96-100		20.50
101-105		24.00
106-110		27.50

Less 10 per cent. f.o.b. Toronto.

Wired glass	18c. to 20c. per sq. ft.

Brick, Tile, Terra Cotta, Sewer Pipe

No. 1 dry pressed red bricks	$14.00 to 17.00 per M
No. 1 dry pressed buff bricks	18.00
Red stock bricks	10.00 to 12.00
Sand Lime Brick	8.50 to 9.00
Grey stock bricks	10.50 to 11.50
Sewer Brick	13.00 to 14.00
Wire cut brick for foundation work	11.00

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

Price List of Building Materials—*Continued.*

Price at Toronto—*Continued*

Porous terra cotta bricks	$12.00 to 15.00
No. 1 enamelled bricks, all colors, from	80.00 to 150.00
Fire brick	26.00 to 30.00
Oriental brick	30.00
Sewer pipe, 4 inch	10c. foot
Sewer pipe, 6 inch	16c. foot
Verandah post caps, 16 in.	1.45 each
20 in.	1.75 "
Chimney Caps, 1 flue in 1 piece	2.00 "
2 flues in 2 pieces	3.50 "
3 flues in 3 pieces	5.00 "

Cement, Plaster, Stone, Etc.

Cement (bags extra)	$1.80 bbl. (1.55 in car lots)
Sand, for cement or brick work	1.75 a yard
Lime	.35 cwt.
Hydrated Lime	10.00 ton
Mortar color	Black, 3; red 1½
Plaster of paris	$1.50 to 2.50
Crushed stone, 2 in.	1.40
Crushed stone, 1 in.	1.45
Crushed stone, ⅜ in.	1.50
Hardwall plaster	$9.50 to 12.00 neat
	6.50 sanded
Gravel	1.80
Hair (plaster)	.05 lb.

PRICE AT WINNIPEG

Hemlock Lumber

2 x 4 in. to 2 x 12 in., 8 to 14 ft.	$29.00
2 x 4 in. to 2 x 12 in., 16 ft.	29.00
2 x 4 in. to 2 x 12 in., 18 ft.	29.00

Shingles, Lath Roofing, Etc.

XXX B. C. cedar shingles	$4.00 & 3.50 per M
No. 1 pine lath	5.75 per M
Metal lath	.16 to .20
Roofing felt (2 ply)	2.50 per roll

Hardware

Nails, wire, common	$3.00 per keg
Nails, cut, common	3.35
Sash weight, cast iron	2.75 cwt.
Tarred felt paper	1.00 per roll
Building paper	.90
Insulating paper	1.25

Glass

United inches	Single	Double
Up 25	$4.50	6.00
26-40	4.75	6.50
41-50	5.25	7.25
51-60	5.75	8.00
61-70	6.25	9.00
71-80	7.00	10.00
81-85		11.00
86-90		12.00

Price at Winnipeg—*Continued*

	Double
91-95	$14.00
96-100	16.50
101-105	19.00
106-110	21.50

Brick, Tile, Terra Cotta, Sewer Pipe

No. 1 dry pressed red bricks	$25.00 to 50.00
No. 1 dry pressed buff bricks	25.00 to 50.00
Red stock bricks	13.00
Sand Lime Brick	12.00
Porus terra cotta bricks	$18.00 per M
No. 1 enamelled bricks, all colors, from	100.00
Fire brick	45.00
Oriental brick	35.00
Sewer pipe, 4 inch	.10½ per ft.
Sewer pipe, 6 inch	.16½ per ft.

Cement, Plaster, Stone, Etc.

Cement (bags extra)	$2.50 per bbl.
Sand, for cement or brick work	1.75 a yard
Lime	.32 per bu.
Hydrated Lime	12.00 per ton
Mortar color	.05 per lb.
Plaster of paris	0.75 per bag
Crushed stone, 2 in.	2.50 per yard
Crushed stone, 1 in.	2.75
Crushed stone, ⅜ in.	2.75
Hardwall plaster	12.00 per ton
Gravel	1.85 per yard
Hair (plaster)	1.25 per bale

PRICE AT VANCOUVER

Shingles, Lath Roofing, Etc.

XXX B. C. cedar shingles	$2.20 & 2.10 per M
No. 1 pine lath	2.25 per M

Hardware

Nails, wire, common	$3.25 per keg
Nails, cut, common	4.25
Tarred felt paper	.90 per roll
Building paper	.70

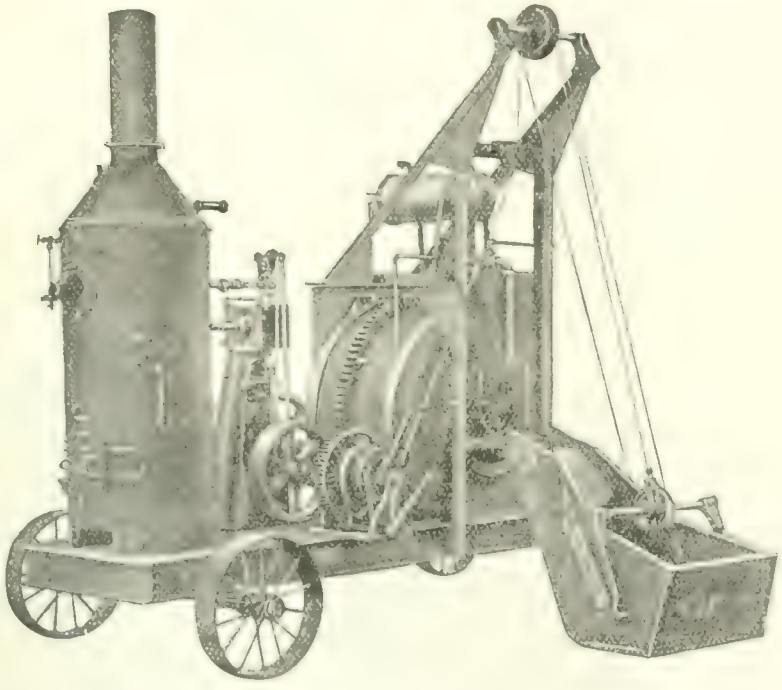
Brick, Tile, Terra Cotta, Sewer Pipe

No. 1 dry pressed red bricks	$45.00 per M
No. 1 dry pressed buff bricks	45.00
Red stock bricks	13.00
Fire Brick	45.00
Sewer pipe, 4-inch	.14 per ft.

Cement, Plaster, Stone, Etc.

Cement (bags extra)	$3.00 per bbl.
Lime	1.25 per bbl.
Hydrated Lime	4.25 per bbl.
Plaster of paris	4 50 per bbl.
Hardwall plaster	14.50 per ton
Hair (plaster)	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.



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Power loader discharges perfectly clean and will not spill any of the contents

This machine is built entirely of steel; the design is of the most approved pattern

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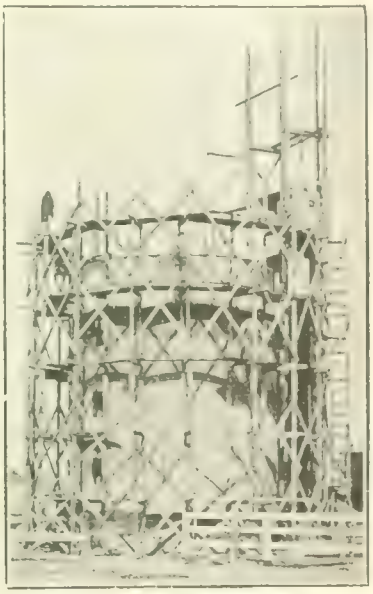
Agencies VANCOUVER, B. C. Equipment Co. — FORT WILLIAM, Northern Eng. and Supply Co. — MOOSE JAW, Sask. Bridge and Iron Co., Ltd. — MONTREAL, Foss & Hill Mach. Co. — REGINA, H. A. Knight — QUEBEC, A. D. Masson

There's Only ONE RIGHT Way—This is IT

The Polk System

If you have not yet adopted the Polk System in your construction work --- **Get Busy** or some other contractor who can see the enormous money saving possibilities in our method will be reaping the profit that might have gone to you.



Another System

The Obsolete, Money Wasting Method

OR THE POLK SYSTEM

¶ The Polk System builds true to a circle, true to wall thickness and true to a perpendicular.
¶ Does away with a risky, complicated system of scaffolding.
¶ Cuts construction costs 40%.
¶ Does away with delay—makes time certain.
¶ Produces perfect *Concrete Silos, Water Tanks, Grain Storage Tanks, Coal Pockets, etc.*

It will pay you to make enquiries now.

"IT RENDERS THE SERVICE"

POLK GENUNG POLK CO. :: Fort Branch, Indiana

CLASSIFIED DIRECTORY A BUYER'S GUIDE FOR BUILDERS IN CANADA

Asbestos
[illegible]

Asbestos Goods
[illegible]

Alabastine
Alabastine Co., Paris Ont.

Asphalt, Felt
[illegible]

Automatic Gas-Steam Boilers
[illegible]

Axes
Jas. Smart Mfg. Co., Brockville, Ont.

Barrows and Concrete Carts
London Concrete Machinery Co., London, Ont.

Baled Shavings
[illegible]

Beaded Sheets
Metal Shingle & Siding Co., Preston.

Blinds, outside shutters
The R. Laidlaw Co., Limited, Toronto.

Blinds, Venetian
The R. Laidlaw Co., Limited, Toronto.

Blind Hinges
Jas. Smart Mfg. Co., Brockville, Ont.

Blue Printing
Eugene Dietzgen Co., Ltd., Toronto.

Blue Print Papers
Eugene Dietzgen Co., Ltd., Toronto.

Brick Stains
Braid & McCurdy, Winnipeg, Man.

Bronze Cast
W. H. Thornhill Co., Winnipeg.
Dennis Wire & Iron Work Co., London.

Builders' Elevators

Builders' and Contractors' Supplies
The R. Laidlaw Co., Limited, Toronto.

Builders' Hardware
Jas. Smart Mfg. Co., Brockville, Ont.
Cowan & Britton, Limited, Gananoque, Ontario.

Builders' Supplies
Bournival & Co., Montreal.

Building Paper
[illegible]

Butts and Hinges, Steel
Jas. Smart Mfg. Co., Brockville, Ont.
[illegible] Ontario.

Burial Vault Molds
Ideal Concrete Machinery Co., London.

Casement and Sash (Steel and Bronze)
W. H. Thornhill Co., Winnipeg.

Carts, Concrete
London Concrete Machinery Co., London, Ont.

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

Ceilings and Walls, Embossed Steel

Cement (Portland)
Braid & McCurdy, Winnipeg, Man.
Ontario Lime Association, Toronto.

Cement Pools
Wettlaufer Bros., Toronto, Ont.

Cement Sains
Braid & McCurdy, Winnipeg, Man.

Cement Workers' Tools
London Concrete Machinery Co., London, Ont.

Colors for Concrete
[illegible]

Columns
Batts, Limited, Toronto.
The R. Laidlaw Co., Limited, Toronto.

Concrete Block Machines
C. S. Wert, Kendallville, Ind.
Ideal Concrete Machinery Co., London.
London Concrete Machinery Co., London, Ont.
Wettlaufer Bros., Toronto, Ont.

Concrete Brick Machine
C. S. Wert, Kendallville, Ind.
Ideal Concrete Machinery Co., London.
London Concrete Machinery Co., London, Ont.
Wettlaufer Bros., Toronto, Ont.

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

Concrete Machinery
Bournival & Co., Montreal.

Concrete Mixers
Bournival & Co., Montreal.
C. S. Wert, Kendallville, Ind.
Ideal Concrete Machinery Co., London.
London Concrete Machinery Co., London, Ont.
Wettlaufer Bros., Toronto, Ont.

Concrete Floor Tile Machinery
C. S. Wert, Kendallville, Ind.

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

Concrete Brick Moulds
C. S. Wert, Kendallville, Ind.

Concrete Reinforcements
Metal Shingle & Siding Co., Preston.

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

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

Contractors' Machinery
Wettlaufer Bros., Toronto, Ont.

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

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

Crestings
Metal Shingle & Siding Co., Preston.

Crushers
Wettlaufer Bros., Toronto, Ont.

Curb Stone Machines
Ideal Concrete Machinery Co., London.

Cutouts
Duncan Electrical Co., Montreal.

Daylight Rods
Consolidated Plate Glass Co., Toronto.

Damp Proofing
Braid & McCurdy, Winnipeg, Man.

Deadening Quilt
Braid & McCurdy, Winnipeg, Man.

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

Doors
Batts, Limited, Toronto.

Doors (Wooden)
Batts, Limited, Toronto.
Georgian Bay Shook Mills, Limited, Midland, Ont.

Doors, Veneered
Batts, Limited, Toronto.

Door Trimmings
Metal Shingle & Siding Co., Preston.
W. H. Thornhill Co., Winnipeg.

Doors (Sheet Steel and Bronze)
W. H. Thornhill Co., Winnipeg.

Drag Scrapers
London Concrete Machinery Co., London, Ont.

Drain Tile Machinery
C. S. Wert, Kendallville, Ind.

Drawing Materials
Eugene Dietzgen Co., Ltd., Toronto.

Driers
London Concrete Machinery Co., London, Ont.

Eavetroughs
Metal Shingle & Siding Co., Preston.

Eavetrough and Conductor-Pipe
Metal Shingle & Siding Co., Preston.

Edge Tools
Jas. Smart Mfg. Co., Brockville, Ont.

Electrical Fixtures and Specialties
Duncan Electrical Co., Montreal.
W. H. Thornhill Co., Winnipeg.

Elevator Fronts
Dennis Wire & Iron Work Co., London.

Engineers' Instruments and Supplies
Eugene Dietzgen Co., Ltd., Toronto.

Fasteners, sash and screen
Cowan & Britton, Limited, Gananoque, Ontario.

Fences
Dennis Wire & Iron Work Co., London.
Dominion Ornamental Iron Co., Ltd., Toronto.
George B. Meadows, Toronto.

Fence Post Mould
London Concrete Machinery Co., London, Ont.

Finials
Metal Shingle & Siding Co., Preston.

Fire Escapes
Dominion Ornamental Iron Co., Ltd., Toronto.
George B. Meadows, Toronto.
Dennis Wire & Iron Work Co., London.
Eberhard-Wood Mfg. Co., Toronto.

Fireproof Windows
Metal Shingle & Siding Co., Preston.

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

Flooring and Supplies
Batts, Limited, Toronto.
The R. Laidlaw Co., Limited, Toronto.

Floor Scrapers
Braid & McCurdy, Winnipeg, Man.
Fox Supply Co., Brooklyn, Wis.
Hurley Machine Co., Limited, Toronto.
Triple "A" Machine Co., Chicago.

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

Advertisements that Remind You

CLASSIFIED DIRECTORY—*Continued*

Furnaces
Jas. Smart Mfg. Co., Brockville, Ont.

Furnaces, Hot Air
[illegible] Foundry Co., Hespeler, Ont.

Galvanized Chain Pumps
[illegible] Shingle & Siding Co., Preston.

Galvanized Iron Cornices
[illegible] Shingle & Siding Co., Preston.

Galvanized Tanks
[illegible] Shingle & Siding Co., Preston.

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.

Gasoline Engines
Bournival & Co., Montreal.
Ideal Concrete Machinery Co., London.
London Concrete Machinery Co., London, Ont.
Wettlaufer Bros., Toronto, Ont.

Gas Piping
Consumers' Gas Co., Toronto.

Gas Ranges
Consumers' Gas Co., Toronto.

Gas Water Heaters
Consumers' Gas Co., Toronto.

Gates
Dominion Ornamental Iron Co., Ltd., Toronto.
George B. Meadows, Toronto.

Glass
Consolidated Plate Glass Co., Toronto.
The Toronto Plate Glass & Importing Co., Toronto.
Queen City Glass Co., Toronto.

Glue Pot Heaters
Consumers' Gas Co., Toronto.

Granite (Crushed)
Sand & Supplies, Toronto.

Gravel
Braid & McCurdy, Winnipeg, Man.

Gravel Screens (Power)
Ideal Concrete Machinery Co., London.

Grills, Steel & Bronze
Dennis Wire & Iron Work Co., London.

Hair (Plasterers')
Ontario Lime Association, Toronto.

Hammers
Double Claw Hammer Co., Brooklyn, N. Y.
Lewis Bros., Montreal.
Jas. Smart Mfg. Co., Brockville, Ont.

Hand Scrapers
Fox Supply Co., Brooklyn, Wis.

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

Hardwood Flooring
Batts, Limited, Toronto.
The R. Laidlaw Co., Limited, Toronto.
Siemen Bros., Ltd., Toronto.

Hangers and Fasteners
Cowan & Britton, Limited, Gananoque, Ontario.

Hangers, sash and screen
Cowan & Britton, Limited, Gananoque, Ontario.

Hasps
Cowan & Britton, Limited, Gananoque, Ontario.

Herringbone Lath
Metal Shingle & Siding Co., Preston.

Hinges
Cowan & Britton, Limited, Gananoque, Ontario.

Hooks
Cowan & Britton, Limited, Gananoque, Ontario.

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

Hoisting Engines
London Concrete Machinery Co., London, Ont.

Interior House Finish
Batts, Limited, Toronto.
Georgian Bay Shook Mills, Limited, Midland, Ont.

Iron Fences
Eberhard-Wood Mfg. Co., Toronto.

Jack Screws
Jas. Smart Mfg. Co., Brockville, Ont.

Keene's Cement
Braid & McCurdy, Winnipeg, Man.

Kindling Wood
The R. Laidlaw Co., Limited, Toronto.

Lath
Galt Art Metal Co., Galt, Ont.
The R. Laidlaw Co., Limited, Toronto.

Lath (Metal)
Braid & McCurdy, Winnipeg, Man.

Lime
Ontario Lime Association, Toronto.

Lime, White or Gray
Braid & McCurdy, Winnipeg, Man.

Lockers, Steel
Dennis Wire & Iron Work Co., London.

Lumber
Batts, Limited, Toronto.
The R. Laidlaw Co., Limited, Toronto.

Mortar Cement
Braid & McCurdy, Winnipeg, Man.

Mortar Colors
Ontario Lime Association, Toronto.

Mitre Box
Goodell Mfg. Co., Greenfield, Mass.

Mortar Gauges
Ideal Concrete Machinery Co., London.

Mortar Mixers
London Concrete Machinery Co., London, Ont.

Mortar Stains
Braid & McCurdy, Winnipeg, Man.

Mouldings
Batts, Limited, Toronto.
Georgian Bay Shook Mills, Limited, Midland, Ont.

Ornamental Iron Work
Dominion Ornamental Iron Co., Ltd., Toronto.
George B. Meadows, Toronto.

Nail Pullers
Cowan & Britton, Limited, Gananoque, Ontario.

Nails
Cowan & Britton, Limited, Gananoque, Ontario.

Ornamental Bronze Work
Dennis Wire & Iron Work Co., London.

Ornamental Iron
Eberhard-Wood Mfg. Co., Toronto.

Ornamental Iron Work
Dennis Wire & Iron Work Co., London.

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

Paints (Waterproof)
Freek, Clark & Co., Toronto.

Paint Protective
Braid & McCurdy, Winnipeg, Man.

Patents
J. A. MacMurty & Co., Toronto.

Plaster
Alabastine Hard Mortar Co., Ltd.
Alabastine Co., Limited, Toronto.
Ontario Lime Association, Toronto.
Braid & McCurdy, Winnipeg, Man.

Plaster (Hardwall)
Alabastine Co., Paris Ont.
Ontario Lime Association, Toronto

Plaster Corner Bead
Metal Shingle & Siding Co., Preston.
Braid & McCurdy, Winnipeg, Man.

Plaster Paris
Alabastine Co., Paris Ont.
Ontario Lime Association, Toronto.

Plaster Stains
Braid & McCurdy, Winnipeg, Man.

Planing Mills
Batts, Limited, Toronto.
The R. Laidlaw Co., Limited, Toronto.

Pulpstone
Alabastine Co., Paris Ont.

Pumps
Jas. Smart Mfg. Co., Brockville, Ont.
London Concrete Machinery Co., London, Ont.
Wettlaufer Bros., Toronto, Ont.

Railings
Dominion Ornamental Iron Co., Ltd., Toronto.
George B. Meadows, Toronto.

Ready Roofing
The R. Laidlaw Co., Limited, Toronto.

Receptacles (Electrical)
Duncan Electrical Co., Montreal.

Registers
Jas. Smart Mfg. Co., Brockville, Ont.

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

Ridgings
Metal Shingle & Siding Co., Preston.

Rock Crushers
Wettlaufer Bros., Toronto, Ont.

Roofing
Asbestos Mfg. Co., Montreal.
Metal Shingle & Siding Co., Preston.
Patterson Mfg. Co., Limited, Toronto.
Braid & McCurdy, Winnipeg, Man.

Roofing Tile Machines
Ideal Concrete Machinery Co., London.

Sand
Braid & McCurdy, Winnipeg, Man.

Sand and Gravel
Sand & Supplies, Toronto.

Sand Sifting Machines
London Concrete Machinery Co., London, Ont.

Sash
Batts, Limited, Toronto.
Georgian Bay Shook Mills, Limited, Midland, Ont.

Sash Holders
Smith Hardware Co., Montreal.

Sashes and Doors
Batts, Limited, Toronto.
Pembroke Lumber Co., Pembroke, Ont.
The R. Laidlaw Co., Limited, Toronto.

Scraper Knives
Fox Supply Co., Brooklyn, Wis.

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

Scrapers, Drag
London Concrete Machinery Co., London, Ont.

Scrapers, Wheel
London Concrete Machinery Co., London, Ont.

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

Screens, Sand
London Concrete Machinery Co., London, Ont.

CLASSIFIED DIRECTORY—*Continued*

Stairs
Batts, Limited, Toronto.
The R. Laidlaw Co., Limited, Toronto.

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

Steam Room Brick and Block Cars
C. S. Wert, Kendallville, Ind.

Steam Engines
Wettlaufer Bros., Toronto, Ont.

Stone (Crushed)
Ontario Lime Association, Toronto.
Sand & Supplies, Toronto.

Store Front Bars
Consolidated Plate Glass Co., Toronto.

Store Fronts
Braid & McCurdy, Winnipeg, Man.

Storm Windows
Cowan & Britton, Limited, Gananoque. Ontario.

Storm Sash
Batts, Limited, Toronto.
The R. Laidlaw Co., Limited, Toronto.

Store Fixtures
Batts, Limited, Toronto.
Metal Shingle & Siding Co., Preston.
The R. Laidlaw Co., Limited, Toronto.

Surveying Instruments
Eugene Dietzgen Co., Ltd., Toronto.

Screens and Sidewalk Tools
Wettlaufer Bros., Toronto, Ont.

Screens, window and door
Batts, Limited, Toronto.
The R. Laidlaw Co., Limited, Toronto.

Sewer Pipe
Ontario Lime Association, Toronto

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

Shingles
Batts, Limited, Toronto.
The Bryan Mfg. Co., Collingwood, Ont.

Shingle Stain
Braid & McCurdy, Winnipeg, Man.

Sidewalk Dividing Plates
London Concrete Machinery Co., London, Ont.

Sidewalk Forms, Steel
London Concrete Machinery Co., London, Ont.

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

Silo Block Machines
London Concrete Machinery Co., London, Ont.

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

Soldering Iron Heaters
Consumers' Gas Co., Toronto.

Sound Deadener
Braid & McCurdy, Winnipeg, Man.

Shooks
Georgian Bay Shook Mills, Limited, Midland, Ont.

Skylights
Metal Shingle & Siding Co., Preston.

Sidewalk Prisms
Consolidated Plate Glass Co., Toronto.

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

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

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

Stairs, Iron
Dennis Wire & Iron Work Co., London.
Dominion Ornamental Iron Co., Ltd., Toronto.
George B. Meadows, Toronto.

Stairways
Batts, Limited, Toronto.
The Bryan Mfg. Co., Collingwood, Ont.

Staples
Cowan & Britton, Limited, Gananoque, Ontario.

Stanchions
Metal Shingle & Siding Co., Preston.

Terra Cotta
Braid & McCurdy, Winnipeg, Man.
W. H. Thornhill Co., Winnipeg.
Toronto Plate Glass Importing Co., Toronto.

Thimbles
Metal Shingle & Siding Co., Preston.

Tile, Block and Brick Cars
London Concrete Machinery Co., London, Ont.

Tile (Hollow)
Braid & McCurdy, Winnipeg, Man.

Tile Machine, Drain
London Concrete Machinery Co., London, Ont.

Tile Machine, Sidewalk
London Concrete Machinery Co., London, Ont.

Tiles (Brick)
Braid & McCurdy, Winnipeg, Man.

Timber
The R. Laidlaw Co., Limited, Toronto.

Transfer Cars
London Concrete Machinery Co., London, Ont.

Valley, Galvanized
Metal Shingle & Siding Co., Preston.

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

Ventilators
Metal Shingle & Siding Co., Preston.

Verandah Columns
Batts, Limited, Toronto.
The R. Laidlaw Co., Limited, Toronto.

Wall Board
Braid & McCurdy, Winnipeg, Man.
The R. Laidlaw Co., Limited, Toronto.

Wall Plugs
Ideal Concrete Machinery Co., London.

Wall Coating
Alabastine Co., Paris, Ont.

Warm Air Heaters
Jas. Smart Mfg. Co., Brockville, Ont.

Waterproof Paper
Braid & McCurdy, Winnipeg, Man.

Waterproofing
Ideal Concrete Machinery Co., London.
W. H. Thornhill Co., Winnipeg.

Watering Bowls for Stock
Metal Shingle & Siding Co., Preston.

Weather Strips
Eberhard-Wood Mfg. Co., Toronto.
William Pease Co., Hamilton.

Well Moulds
C. S. Wert, Kendallville, Ind.

Window Frames—Complete
Pembroke Lumber Co., Pembroke, Ont.

Window Frames
Batts, Limited, Toronto.

Window Trimmings
Metal Shingle & Siding Co., Preston.
W. H. Thornhill Co., Winnipeg.

Window Screens
Batts, Limited, Toronto.
The R. Laidlaw Co., Limited, Toronto.

Wire Rope
London Concrete Machinery Co., London, Ont.

Wire Work (Special)
George B. Meadows, Toronto.

Woodworkers (combination)
Elliot Woodworker Co., Toronto.
M. Hutchinson, Toronto.
Sidney Tool Co., Sydney, Ohio.
Parks Ball Bearing Machine Co., Cincinnati, Ohio.

Woodworking Machinery
Bournival & Co., Montreal.

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