October, 1915

Price List - 30

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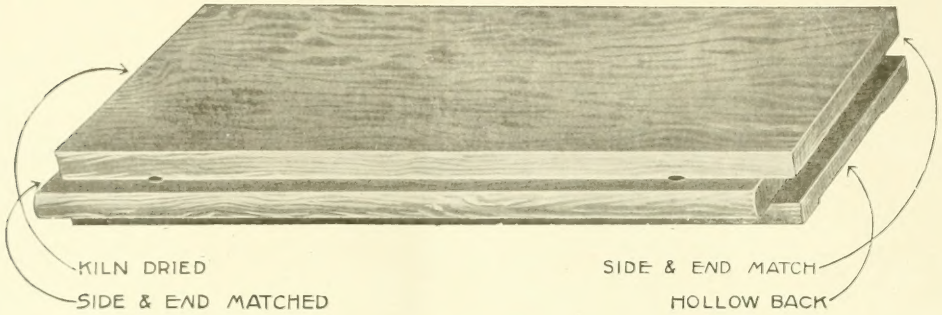
Midland Planing Mill Products

The Leading Stock Lines



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Midland, Ontario

JOHNS-MANVILLE SERVICE TO THE BUILDING TRADE

Johns-Manville Service is an evolution—the growth of half a century's endeavor to insure permanent satisfaction to users of J-M Products, of whatsoever kind. The sale of an article is not the end, it is really the beginning of J-M Responsibility.

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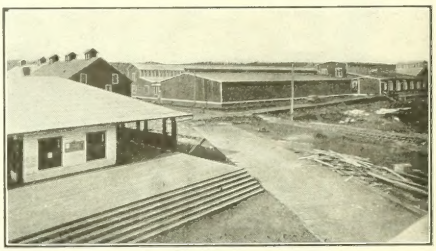
J-M Asbestos Ready Roofing is a Quality Roofing and is coming into more or less extensive use on many classes of buildings where metal roofing would be used ordinarily. Note the substantial character of the building shown here—covered with a J-M Asbestos "White Top." This roof is water-proof, fire-retardant and time-proof. It is the cheapest-per-year of all prepared roofings, for it will never need coating or painting or any other attention. And it will last thirty or forty years!



Canadian Western Lumber Co., Fraser Mills, B.C. A.B. Prana, Vancouver, B.C., Architect. 230,000 sq. ft. J-M Asbestos Roofing laid

J-M Asbestos Ready Roofing will last longer and present a better appearance if you lay it, because putting it on is really a "roofing job" and you know how it should be done. We want it done right because J-M Responsibility must stand back of it.

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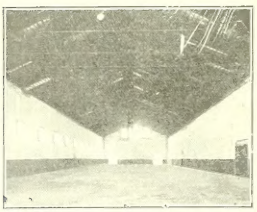
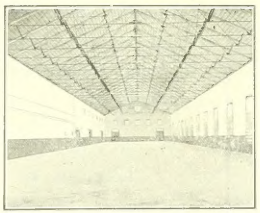
Actual Service Proves that J-M Fireproof Cold Water Paint reduces lighting bills at least 25%



Before using J-M Cold Water Paint



After using J-M Cold Water Paint

It brightens up corners and dark places, thereby making daylight last longer and necessitating the use of fewer lights when working at night.

And in addition to this great saving, the productiveness of employees is increased from 10 to 40 per cent., according to local conditions.

J-M Cold Water Paint is composed of various minerals and cementing compounds and is mixed with ordinary water, which costs you practically nothing. Due to this economy, this paint costs only a fraction as much as oil paints. It covers a greater area and one layer covers better than two layers of oil paint.

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Aug 17/15

Asbestos Manfg Co Ltd
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Yours very truly
James Black
Sec Treas

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VOL. 5 TORONTO, OCTOBER, 1915 No. 10

Editorial Contents

Roomy, Brick Veneer, Hilltop Cottage at Vineland, Ont.

This house, 28 by 38 ft., with 14 ft. wide porch across the front and part of the side, has three bedrooms and bath on upper floor and five rooms and hall below, fine finish, hot water heating. A detailed description is given. Cost of house complete was $3,800.

By L. R. FRETZ

THE accompanying plan shows a roomy hilltop cottage of good design and pleasing appearance built at Vineland, Ont. The outside dimensions of the house are 28 ft. x 38 ft., with a 14 ft. verandah across front of the house and an 8 ft. verandah extending along the side for a distance of 14 ft. A porch 8 ft. wide extends across the back of the house.

The house is brick veneer, of Beamsville pressed brick 9 ft. high, the balance of the wall being shingled with B.C. cedar stained brown, as is also the roof. The verandah and window frames are white, the sash black.

Full Height in all Upstairs Rooms

The outside studding is 12 ft. high, the roof 1-3 pitch. The downstairs rooms are 8 ft. 6 ins. between floor and ceiling, and the upstairs 7 ft. 6 ins. The large closets on upper floor are under the pitch of the roof, so that there are full-height ceilings in all the rooms.

The wall and piers of the verandah are of red sandstone with cement caps. The roof is supported by 12 in. columns. Steps are of concrete with a 2-in. pipe for a railing on each side. The verandah plates are built of ⅞ in. Georgia pine boards built up into a solid 9 in. x 16 in. timber. Ceiling is of ⅜ in. beaded Georgia pine, rail of 4 in. x 6 in., top and bottom being enclosed solid by 2 x 8 in. frame, with ⅞ in. panel trimmed with 1¾ in. raised panel moulding, all of cypress, giving a very good effect. The floor is of 1½ in. Georgia pine on 2 x 8 in. joists and 8 x 8 in. timbers of the same material.

Brick veneer, hilltop cottage at Vineland, Ont. Designed and built by L. R. Fretz.

Upstairs Finish

The whole upstairs is paint finish. The upper hall and bathroom are burlapped three feet high above base.

Walls of bathroom are flat white, same as woodwork. There is a cupboard in bathroom from floor to ceiling between chimney and wall, used for towels, soap, shaving utensils, etc.

The south bedroom has roof garden window from wall to wall, making it very sunny in winter and as good as a screen porch in summer. The east room has two windows, and the north a double casement window.

The back stairs are enclosed with door opening into kitchen. The front stair is open and is built with black walnut newels, treads, and risers; mahogany finish strings.

Downstairs Finish

The front hall and parlor are of same materials. The top floor of both is red oak with 2 in. border of inlaid quartered oak, grain oak, and burl wild cherry around outside of room. The balance of downstairs is 13-16 in. birch.

The dining room and kitchen are all in oak; also the large mantel in dining room is built of same material, while the large fireplace will burn wood. We usually use old pine stumps, as they make a great blaze for an evening fire. Details of construction are given in drawing. It has never smoked in the least bit, even with a fire that would blister varnish on a table at opposite side of room.

Dumb Waiter and Cupboard

The dumb waiter opens into both kitchen and dining room. The kitchen is fitted with a large cupboard, shown in cut, which we like better than a pantry, as everything is within reach of range and table without walking across room. It also holds more than a pantry. The bins contain each 100 lbs flour or sugar and a child can tilt them. The drawers are for linens, towels, cutlery, etc. The part under sink is for pans and kettles, scouring appliances, etc., while the eight compartments in cupboard have ample room for everything needed around a kitchen.

The room off dining room can be used for library or a downstairs bedroom in case of sickness, and the small room off that, and opening into kitchen, for a child's room, or in case of sickness for nurse's rest room.

Basement Layout

The basement is divided as per sketch. The top half of partition between boiler room and coal bin is of expanded metal, so as to let through light. The part for eatables is fitted with a hanging cupboard all enclosed with wire fly screen, and there are tiers of shelves from floor to ceiling for canned goods, etc.

The house is heated with hot water boiler and has good water connections from range to bath and cellar and sink.

House Cost $3,800

The cost of house complete with heating and plumbing was $3,800, but land, grading, well, walks, etc., were an extra charge. Septic tank is used. As will be seen from cut it works on syphon system and gives first class satisfaction.

The house stands on an elevation about 40 ft. above the Queenston and Hamilton stone road about 200 ft.

[illegible] was designed and built by L. R. Fretz.

lake. On the north and west we can see across the head of the lake, and it is possible to see the steam of trains from Hamilton to Toronto on a clear day. North, it is three miles to lake and experimental farm, the view overlooking vineyards and peach orchards. Looking east we can see Brock's Monument and all the country lying between. At night can see lights of elevated cars serving up and down the mountain and of vessels moving along the canal. To the south is the rugged mountain side, with its beautiful wooded crest, so that we consider Leeholme, in the midst of the garden of Canada, an ideal location for a retired gentleman.

* *

Laying Slates in Putty

The subject of slate roofing is one of never ending interest and various are the methods for performing the work. More especially perhaps is this the case as to the best method of laying slates in putty. A writer in a London paper finds that the method often adopted or recommended by architects is not altogether satisfactory, being, in fact, very expensive and often apt to lead to a great deal of trouble. He says:

"Its defects are shown in the accompanying sketch: At A is shown a fillet of putty laid on the margin line or tail line and up the centre of the slate, and the next slate bedded in it, and when the putty gets hard it cracks, owing to the vibration of the roof; water then gets inside the putty, and, there being no other way of escape for it, wells up and gets over the head of the slate underneath and soaks into the roof timbers.

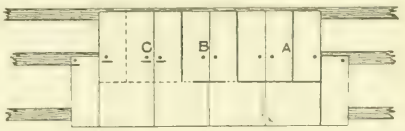
"In the case of a boarded roof, it is often difficult to locate the place at which the water enters, as the roof boarding conducts the water sometimes 20 ft. or 30 ft. from where the leak really is.

"The method shown at B is similar to that illustrated at A, but in B there are two holes left in the tail bed as an outlet for any water that may get inside, which is an improvement on A; but an objection to B is found in the horizontal joints, which look heavy and are not so capable of resisting the action of the wind.

"At C is shown a ball of putty, which (it is about the size of a walnut) is placed just below the two nails, thus stopping the water from drifting up the cross joint, and giving it every chance to escape. The roof should be pointed on the inside with good hair mortar, which tends to keep the slate more rigid.

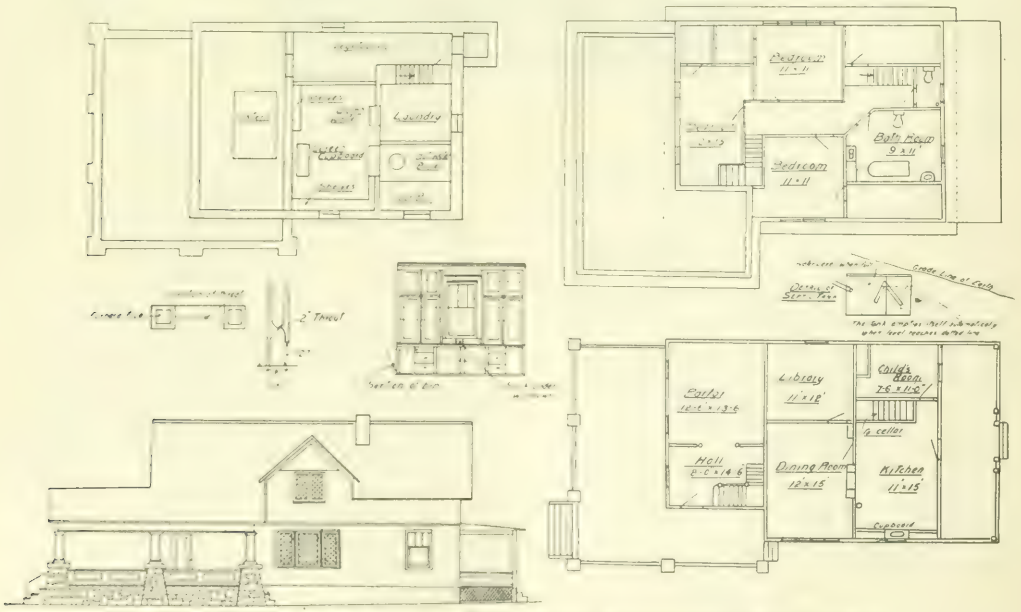
"The writer has found the method last described to be most satisfactory, and has never had any trouble with it. Where putty is used the slates should be painted, and for method C the tilting fillet should be a little thicker. In the illustration the putty is indicated by a thick black line.

"The following is a simple method of lining up a roof before commencing to slate: Gauge up the courses



Laying slate in putty.

so as to have the same margin from the tail of the tile ridging to the tail of the top course of the slate; a short margin on the top looks bad. To obtain cross joints perpendicular to the ridge, mark off a rod, allowing about 3/16 in. for joint, starting with ½ stone, then 1½ stone, and so on to the length of the rod; or, if preferred, with a wing compass on the ridge piece and down at the eaves, then use a chalk line or a lead-pencil line and a straightedge from point to point.



Plans of brick veneer cottage at Vineland, Ont. Details of fireplace, kitchen cabinet and septic tank are given.

Methods Best Adapted to Finishing British Columbia Wood

The most beautiful and harmonious effects can best be obtained by the use of methods which experience has shown best suited to the different species. The following article has been prepared by the British Columbia Forest Branch to assist users of British Columbia wood in securing the best finish.

ALL wood intended for high class finish should be thoroughly dry and free from gum, checks, sap, or knots. It should be milled in the best possible manner, and left perfectly smooth and free from scratches and plane-marks. Wood prepared up to this standard does not always require sandpapering before being stained or otherwise finished. In many cases, however, the mill does not finish the wood surface properly, and it will pay to dress the surface further with the hand smoothing-plane and fine sandpaper. If this is necessary, care should be taken to sharpen the hand-plane iron correctly so as not to leave ridges in the surface of the wood. A steel scraper may be used instead of the hand smoothing-plane in the case of woods of hard nature. The finishing of wood surface by hand smoothing-plane or scraper applies most particularly to large flat surfaces such as floors, doors, wall paneling, casings, etc. For mouldings and very narrow surfaces fine sandpaper is used. Whenever sandpaper is used on wood in preparation for staining, varnishing, or polishing, the finest grade will give the best results. Coarse sandpaper leaves grooves and ridges which show through the stain or other finish and mar the beauty of the grain. After sandpapering, always carefully wipe or brush off all particles of dust before staining or oiling. A sandpaper finish will no doubt be used in most cases, owing to the low cost and speed in turning out work. Care must be taken to use the sandpaper only in the direction of the grain.

Secret of Fine Finish

The secret of fine finishes in stain, varnish, polish, paint, or enamel is in having absolutely dry wood and a smooth surface. All lumber for interior trim should be thoroughly kiln-dried. This is of great importance to the wood-finisher. Beautiful and permanent effects cannot be secured if the material is not dry. Paint or varnish will not cling to moist wood. In Douglas fir and other resinous woods this fact must be emphasized, as if not perfectly dry, moisture and gum may ooze through the finish in small bubbles. Edge-grained flooring laid as it comes from the mill should always be hand-dressed, then scraped, and finally sandpapered along the grain until it is perfectly smooth before any finish is applied.

These Western woods naturally lend themselves to a variety of attractive styles and colors, and so can be made to harmonize with almost any kind of decoration. Experience alone teaches the best method of accentuating or softening the individual markings of each. The following methods of treatment are recommended for the finishing of British Columbia woods:

Natural Finish

The natural finish makes a very simple and satisfactory treatment for fir and other Western woods. The wood should first be prepared to a perfectly smooth surface. Then apply a light coat of pale raw linseed oil to which has been added a little turpentine. Allow this to penetrate the wood, and then wipe the surface thoroughly and dry for ten or twelve hours. Next apply a coat of white shellac, and when dry rub smooth with No. 0 fine steel wool. To finish, apply two coats of good quality rubbing varnish and rub smooth between the coats with fine steel wool. When dry rub with powdered rotten stone and oil for a polished gloss finish, or if dull finish is desired use flat varnish for the finishing coat instead of a second coat of gloss varnish. The best results for red cedar are obtained by the following methods: Apply one coat of good clear liquid filler and finish with two or three coats of varnish. Rub down with fine steel wool between each coat, and the last coat of varnish can be polished with rotten stone and oil if desired. Particular care should be taken with cedar, as the wood is easily scratched.

Oil Stains

Many beautiful effects can be obtained and the grain brought out more prominently on any of these woods by the use of oil stains.

Apply one coat of penetrating oil stain of the desired shade with a soft brush, then wipe off with a soft rag when partly set and sufficient depth of color has been obtained. To ensure an even tone of color it may be necessary when this coat is dry to go over the light parts and tone down to suit the darker shades. Allow this to dry for about twelve hours, and apply one coat of shellac, using white shellac in light stains. When dry rub down lightly with fine steel wool, dust off and apply the first coat of rubbing varnish. The finish coat of rubbing or polishing varnish may be applied when the second coat is dry, and when hardened should be rubbed with curled-hair pad.

For glass finish, after forty-eight hours rub with pumice stone, oil, and felt pad. For polished finish rub with ground pumice stone, oil, and felt pad and polish with rotten stone and oil. All work should be finished in a dry atmosphere at a temperature of about 70 degs. Fahr. In the use of stains a very important consideration in bringing out the grain is the prevention of overstaining. Apply the stain with a brush, and then after a few minutes wipe off with a cotton rag or cheesecloth to bring out the tint desired. This removes the surplus stain from the hard part of the grain, brings out the distinctive markings, and prevents blurring with too much stain. Fine deep finishes are obtained, of course, by the use of extra varnish coats and a greater amount of rubbing.

Finishing Floors

There are several methods of floor finishing used. Two of the best are given here, both economical and very serviceable. The first is very easily applied and dries quickly.

Shellac Finish

New floors of Douglas fir or hemlock should be dressed off with the hand-plane and well scraped. This

is essential to good results. When clean apply one coat of good paste filler. The filler should be thinned down with raw linseed oil and benzine (mixed ratio 1 to 3) and allowed to thoroughly penetrate the pores of the wood. Any filler which remains on the surface should then be wiped off with a dry cloth and a coat of white shellac applied. The first coat of shellac should be thinned with denatured alcohol, allowing it also to easily penetrate the wood. The floor should then be gone over with a very fine sandpaper. Finally two coats of shellac are applied, sandpapering between each. The second coat should be heavy and the last as heavy as can be worked. This process is for the very

VARIOUS USES OF B. C. WOODS

[illegible] results:

General Construction—[illegible]

Dimension Timbers—[illegible]

Siding—[illegible]

Flooring—[illegible]

Roofing—[illegible]

Paneling—[illegible]

Doors—[illegible]

Interior Finish—[illegible]

Car Stock—[illegible]

Poles—Red Cedar.

best class of work and gives a highly polished floor which will wear well. The use of a wood filler may be omitted on floors where the wear is not severe. It gives body, however, to the finish, and will more than repay the cost and labor.

Varnish Finish

A second method is as follows: On the prepared floor apply a light coat of filler, rub down with fine steel wool to remove any excess filler that remains on the surface, then apply one coat of good quality floor varnish and rub down with fine steel wool. To finish in gloss give two coats of best quality varnish. If a dull finish is desired, rub down the last coat with fine pumice. For a wax finish apply one coat of prepared floor wax instead of two coats of floor varnish, and polish with weighted polishing brush.

To restore the original finish to a floor when floors become dull and show wear, go over the floor with a cloth dampened with benzine, then apply a coat of floor wax with a soft cloth. Orange shellac should not be used as a finish as it darkens the floor. The above floor finishes are, of course, in natural colors. If stain effects are desired in floors, the stain is applied first before the shellac or finish coats are put on.

Outside Finish

To finish doors, porch panels, and outside trim which are exposed to the elements, the following method is recommended: Thoroughly prepare and smooth the surface of the wood. Then apply a heavy coat of boiled linseed oil which contains a drying substance (any good liquid drier). Allow this to thoroughly penetrate the wood. This coat is necessary to prevent absorption of oils from the varnish. After the oil has dried sufficiently, apply two coats of outside varnish, rubbing down between each, and polish the last coat with pumice stone and oil. If color effects are required the desired stain is applied first, followed by the oil and varnish.

Paint Finishes

If a painted finish is desired, the wood should be prepared to a perfectly smooth surface as described above, except that the sandpapering may be done across the grain. Good paint work demands at least three coats (four are better) of pure thoroughly mixed paint, rubbing down between each coat. Paint should be applied in several thin coats rather than in one or two heavy coats. For varnished or enameled surfaces give three coats best paint, well rubbed down, and two coats of varnish or enamel. Ready-mixed paints can be obtained in abundance. A good machine-mixed paint is usually found to be cheaper, more consistent, and gives better satisfaction than does hand-mixed paint unless mixed by an expert. Care should be taken, however, to select only a first class brand. Good paint consists of pigments such as genuine white lead, to which is added about one-third zinc oxide, pure turpentine, and pure linseed oil (raw for inside work and boiled for outside work), thoroughly mixed, with the addition of sufficient driers. For white enamel work zinc white will be found better than white lead for the undercoatings.

Brief Specifications for Finishing Douglas Fir and Other Western Woods

Natural Finishes—

(1) Dull finish: Two coats pure raw linseed, well rubbed.

(2) Flat finish: One coat pure raw linseed oil; one coat white shellac; one coat Flattine varnish.

(3) Gloss finish: One coat pure raw linseed oil; one coat white shellac; two coats bright hard varnish.

(4) Wax finish: One coat pure raw linseed oil; one coat white shellac; two coats prepared wax (beeswax and turpentine), well rubbed with soft cloth or weighted brush on floors.

Stain Finishes—Substitute stain of the desired shade for linseed oil in the above formulas for natural finish.

Rubbing—Rub down between all shellac and varnish coats with very fine sandpaper or pumice stone and oil. Use the best materials obtainable. A high polish may be obtained on varnished surfaces by rubbing down with rotten stone and oil.

Polished Surfaces—To give varnished surfaces a polished appearance, finish with hard bright varnish and rub down with powdered rotten stone and oil.

Shellacs—Do not use orange shellac on natural shade or light stain finishes, as the strong orange color will destroy the tones in the wood.

* *

Nails to Use on British Columbia Shingles

Investigation will prove that when a defect is found in a red cedar shingled roof that it is due to using ordinary wire nails, which rust out, leaving the shingles loose. To get the utmost wear out of your shingles, you must lay them with galvanized or the old-fashioned iron cut nails, which cost very little more. You can also use zinc or copper nails, which are better yet. This applies to all shingles, whether made of red cedar or of other woods. Each shingle should be well nailed and care be taken that all joints are well covered.

Concrete block and shingle house of M. L. Alton, Burlington.

Attractive Concrete Block and Shingle Residence

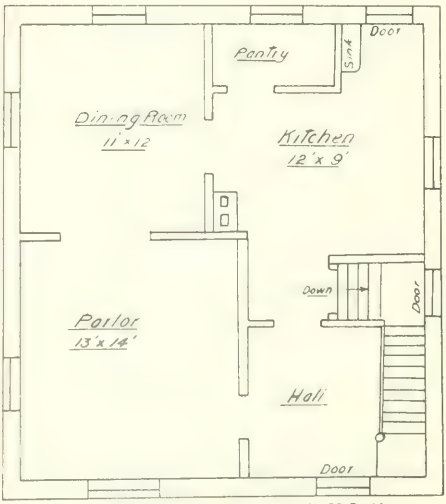
Designed and built by Maitland L. Alton

MANY concrete block houses have been erected in the past few years, and very attractive designs have been made, using the concrete blocks alone or with combinations of stucco and shingles. The house shown herewith is an attractive combination of concrete blocks and shingles designed and erected for his own use by Maitland L. Alton, a builder at Burlington, Ont.

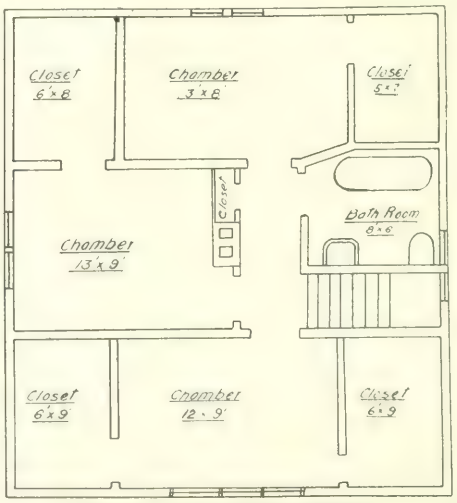
The entrance consists of a large verandah extending across the whole front of the house. The base pillars are of concrete block and the top pillars tapering to the verandah roof are sheeted with shingles. The verandah is also enclosed with a shingle facing.

The wall does not extend beyond the line of the verandah roof, but the gables are large, giving a large first floor area. The eaves of the verandah continue around the house in a continuous line, the whole design being a very symmetrical arrangement.

The arrangement of rooms on the ground and first floors is shown in the accompanying plans. On the ground floor are parlor, dining room and kitchen with dimensions as marked, and a large hall. On the first floor are three bedrooms provided with large clothes closets. A commendable feature, from the housewife's viewpoint, is the arrangement of the front room with two large 6x9 closets. These, as well as the two at the back, extend under the slope of the roof, thus making use of all available space. There is also a linen closet with door opening from hall.



Ground floor of house designed and built by M. L. Alton.



First floor. Note the closet accomodation.

Inspection of Buildings a Need

Fire departments, if they be properly equipped for inspection of buildings and conditions before the fire, with printed forms to guide them, will become expert's in the work, and the record they will strive for will be, not how many fires or the time of getting to them, but rather the minimum of fires and consequent reduction of losses in their respective districts. No one better than the firemen by their inspections can inform the people of hazardous conditions and careless habits with reasonable success of getting them remedied, because the firemen are looked upon by the public as their natural protectors when fire comes into the question, and by the exercise of a bit of tact on the part of the fireman inspector, his word of counsel and recommendation will be listened to, and if not always, at least in many cases, acted upon. These were suggestions given by Mr. A. Lindback, Manitoba's fire commissioner, to the Provincial Association of Fire Chiefs at Ottawa.

Surfaced Roofings and Shingles

Surfaced roofings and shingles are finding a wide sale, owing to being made in different pleasing colors, for use on residences and other constructions where durability and beauty are both desired. Prepared roofings have been used to a considerable extent, but more on business buildings, where they have always proved very satisfactory. The manufacturer states that the institution of surfaced roofings increases their usefulness, making them applicable to all forms of construction.

The manufacturer of the new surfaced roofing makes it in one weight, but the standard weight adopted is such as to permit its use under all conditions. The surfaced roofing is put up in rolls containing one square or 108 sq. ft. The directions and articles for applying are packed in the centre of the rolls.

The surfaced shingles are made of heavier material than the roofing, owing to the fact that it is not desirable to have them as pliable as the roofing itself. They are laid in the same manner as cedar shingles. Once installed, they require no attention, and are practically everlasting.

The surface is in red and green slate, gravel, or grit. The roofing stone or slate surfacing is in natural colors.

Mr. J. H. Brown, general manager of the Canadian Roofing Mfg. Co., Windsor, referring to these new roofings, said:

"The Canadian Roofing Mfg. Co., Ltd., in manufacturing these materials, are following out the same plans that they have always rigidly stood by, that is, making the best possible material, so that made-in-Canada materials can unquestionably be said to be equal to, or better than, any made anywhere else."

Excavator and Steam Shovel

The accompanying illustration shows an excavator and steam shovel, the car, derrick and arm of which were made at the prison farm, Guelph. It is mounted on a flat car, and an ordinary hoisting engine is used. It is used for excavating gravel and boulders and has handled over 200 yards per day, requiring two men and a fireman. The outfit, exclusive of the engine, was built at a cost of between $700 and $800.

We are indebted to Mr. S. A. Armstrong, Assistant Provincial Secretary, Parliament Buildings, Toronto, for this information.

Annual Convention of Canadian Clay Products Manufacturers

The Canadian National Clay Products Association will held the next annual convention at the King Edward Hotel, Toronto, Tuesday, Wednesday and Thursday, January 18, 19 and 20, 1916.

Gerald—Say, Pa, what's a bungalow?

Pa—Well, a bungalow is a parody on a house.

Excavator and steam shovel made at the Prison Farm, Guelph.

Complete Construction Details of a Moveable Greenhouse

Structural details relating to the erection of a portable greenhouse—Installation of the hot water heating system

WHILE perhaps not directly within the field embraced by the work usually performed by the builder, the construction of a portable greenhouse is something in which he is at least incidentally interested, and we therefore present to the attention of our readers some particulars which were contained in a paper on the subject read by A. Pullen-Burry at a late meeting of the Horticultural Club, in London, England. It constituted probably the most detailed account of experiences with traveling greenhouses yet published.

An acre of land 440 ft. by 100 ft. is divided up by longitudinal foundations 16 ft. apart centre to centre, and a cement rail 6 in. by 5 in. cast in moulds and placed thereon; a shallow division wall for the sidelights to shut on is provided at intervals of 40 ft., centre to centre, thus making in 11 traverses 60 beds 13 yds. by 5 yds.—a little over 2 rods—in each bed.

The traverses cost us about $50 each, including two old rails, which act as curbs, and are embedded in the two outer cement rails at either end of the hothouse. In practice we find that only one is necessary, viz., at the end carrying the boiler and multiplying gear.

It is not necessary that the land be level, except in the 100-ft. direction or length of the hothouse. In the other direction there may be varying gradients, as the gutter acts like the back of a book, and thus allows movement.

The house itself is, in motor car language, the "tonneau," and can be of any width or any height under the ridge of eaves. It can, if necessary, take quite large trees, say nine feet high, in successive shifts, the sidelights in these circumstances opening like barn doors, and back to back, passing with the house through the trees over the cement rails. The usual ventilating gear is used, and in our model the sidelights swing on the plate and close against the cement division wall in an oblique direction. We find, however, that if the side shutters are short and independent and simply hooked on to the plate it is quite sufficient, and the draught is more effectively excluded. If in winter there is a draught under the shutters a little soil sprinkled along the division walls effectually checks it.

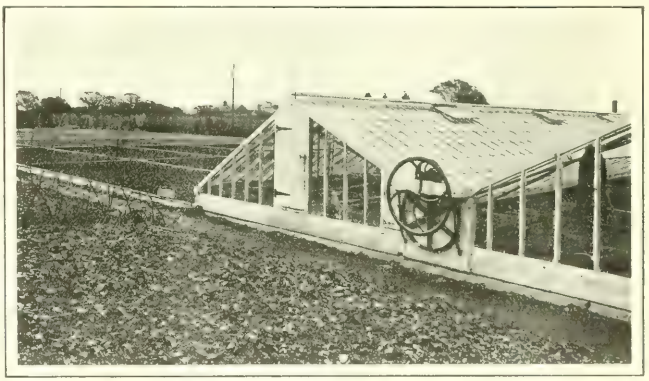
The ends of the house are glazed in the usual way. The doors are of matchwood, in the centre, under the ridge. The step up to the door is ten inches in height.

There is a strengthened 1½ in. by 9 in. plank running down the house, door to door, on which the watering is done by a hose from Norwich unions fixed to a 1 in. main under the ridge, and traveling with the house. This is most convenient, and it takes only half an hour for the whole 100-ft. by 40-ft. hothouse to be watered satisfactorily by one man. The water is supplied from one left and one right jointed socket, connected with a stationary watercock, in one of the houses; a short piece of hose carries the union.

Heating System

The hot water pipes are simply laid over the stretchers of the "chassis," and are on a dead level. The lay of the land is against the boiler, as in the 11 traverses there is a rise of four feet, making a six-inch fall from the boiler to the farthest flow pipe.

The returns, two in each house, are collected at the stretcher next to the last. They hang thereon and rise up to the plate, thus allowing the crops to pass underneath, and continue outside the house to the thermo-dynamic valve just before the boiler is reached. The boiler is mounted on wheels, stayed to the plate, and runs in an upright, balanced position on the outside rail which contains the metal. The flow leaves the top of the boiler and descends to the inside of the last stretcher, passes through both houses under the foot-



Exterior view, showing operating gear.
(Illustration by courtesy of "Builder Age.")

way, and rises again with valves at each point to the branch flows. The system works perfectly and there are 1,000 ft. of 4-in. pipe on an Anglian boiler, for which the makers only guarantee 900 ft., and the return heat in 1½ hours with a strong northeasterly wind blowing and an uncovered boiler.

A manifest saving in coal will appeal to growers in that heat is raised in far less time than by the usual lazy gravitational system.

Construction Details

The "chassis" is of pitch pine and cast iron. The plate measures 3 in. by 6 in., and the trussed stretchers are simply two planks of 1¼ in. by 7 in. pitch pine, with blocks at intervals, to carry the purlin posts and act as distance pieces for the frames of the gearing. In each stretcher there are four carrying wheels of cast iron with a bolt through. The frames are cast alike

and used in pairs. They are bolted through the stretchers on either side and carry a 9 in. by 3½ in. steel gutter, which, with a 2 in. by 4 in. plate bolted to each side, carries the roof. These frames rest upon the bolt through the driving wheel, which has a flat bearing surface, and a set of cogs on its side, turned by a small sleeve pinion keyed to the longitudinal shaft, which runs with couplings throughout the house. It is affixed at one end, outside the house, to a large cogwheel, which in turn is operated by a spur and pinion in the same way as a clock is geared. The final flywheel is driven by hand, or, if required, by a small portable motor (like a bicycle engine), weighing from 28 to 56 lbs. and simply fixed by fly nuts to the frame carrying the multiplying gear, which is 4 to 1 at the driving wheel and 120 to 1 in all. One man can easily move the house over the necessary 40 ft. in 20 minutes without undue effort.

But the most important thing is the manner in which the torque in 100 ft. of shaft is taken up and the work of the whole synchronized throughout the house. If this difficult problem had not been solved there would have been no transverse traveling hothouses; for the tendency would have been to move the end carrying the multiplying gear first and so set up an inclination in the house to travel in an immense circle. The friction produced by the endeavor to make it travel in a straight line would soon have smashed up something.

It is obvious that if both ends move simultaneously the distance traveled is of no moment. One hundred miles might be traveled as well as 100 ins. if the gauge were correct, and if the four wheels at the corners which press against the steel rail did their duty.

The spur wheel which moves the driving wheel is loose, and, carrying the shaft, rests one of its sleeves on the flat face of the driving wheel. This engages the driving wheel cogs, so that they are always in true mesh, no matter where the spur wheel is in relation to the driving wheel, thus allowing the shafting a side or lateral movement. The sleeve spur wheel is held in position by a loose guide piece, like a half plummer block upside down; this guide rests its wings on two distance pieces between the two frames which are cast on one of them.

Through these distance pieces are two long steel screws, which we call torque-pins, capable of adjustment, and locked by a nut on the outside of the distance pieces. They are easily attainable from the interior of the hothouse.

Thus the shaft turns the sleeve spur wheel, which travels over the flat surface of the driving wheel in its guide, until the guide presses against the torque pins, which give motion to the house.

These torque pins are at the end farther from the multiplying gear, screwed up tight against the guide. At each set of gear and stretcher the amount of torque in the 2-in. shaft is relieved by the lateral movement of the guide, which comes in contact with the torque pins only when desired. It is found by experience that the torque in the shaft when driving a 100-ft. by 40-ft. hothouse, weighing 20 tons, with the boiler at the end farthest from the gear, is about two threads of the torque pins for each 16 ft., so that the pins are screwed out an extra two threads for every set of gears in the house.

An interesting experiment took place when the boiler was added and the pipes filled with water.

The house was adjusted and moved perfectly without the apparatus before mentioned, and when the extra weight (1½ tons) was added, it was found that the farther end, where the great weight lay, was ⅜ in. lazy in starting. At once we had half a turn of the torque pins eased out, and the same end was then 3/16 in. lazy; it was obvious that another half turn was all that was required.

For all practical purposes the torque pins are set once and for all, and any interference with them without knowing their use would cause trouble.

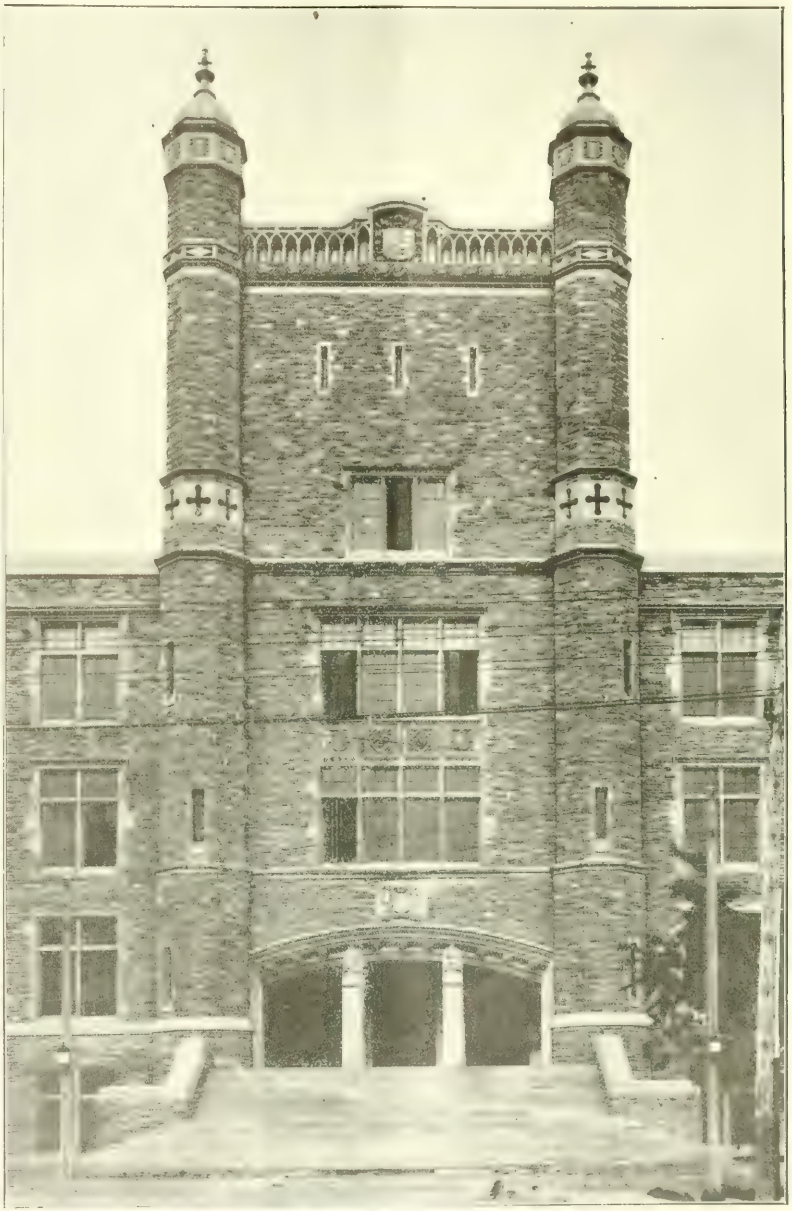
With reference to the paths, it is found that one bag of cement is about the right proportion for each 40 ft. of cement pathway.

These pathways are more useful for getting at the crops, being narrow, and suitable to every kind of weather. If properly constructed, with a decent foundation, they do not crack or scarify. Even after they have been used dozens of times the brush marks upon their surfaces are still visible.

* *

Becoming soured over the thought that your efforts are not properly appreciated will not help you much in getting the recognition you deserve.

EXTERIOR view of store of W. N. S. Hunter at the corner of Prospect and Maple Avenues, Hamilton, Ont. The store is in a residential section and fits in well with the surroundings. The grocery section is on the right and the butcher shop on the left with separate entrances to each. There is a connecting door inside, however.



BEAUTIFUL TOWER ENTRANCE OF THE NEW TORONTO TECHNICAL SCHOOL.
Architects: Ross & McDonald. Contractors: Norcross Bros.

Piling Slate

For the prevention of avoiding breakages in piling slate, say 10x20 the following rules have been drawn up by the Standard Slate Corporation:

1. Lay strips, or preferablya board, so as to keep the slate from the ground and to keep the pile even, equalizing weight.

2. Lay a pile of slates 10 inches high flat on the boards.

3. Stand a row of slates on edge against this pile, allowing them to stand as nearly straight up and down as possible.

4. Start the second tier with a pile 20 inches high of slates laid flat. This pile should be placed on the slates which stand on edge.

5. Then put a row of slates as per rule No. 3, put two rows of strips or laths underneath.

6. Put a third tier on top. It is not wise to stack slate higher than three tiers.

7. On top of the last tier lay a row of slates, laid flat. Cover these with two or three more rows, laid so as to cover the joints.

This makes a good, solid pile, protected from getting dirty, and the breakage saving will more than pay for the care taken.

* *

Building Plans with Interior Views and Details

Guaranteed Building Plans is a collection of plans and exterior views of various buildings arranged and described by William A. Radford and published by the Radford Architectural Co., 1827 Prairie Ave., Chicago. It is well bound in heavy covers, 256 pages, 8½x11½ inches.

The plans included in the volume are of all classes of buildings, cottages, bungalows, residences and flats, of frame, brick, cement plaster, concrete blocks, hollow tile, stucco, etc., and farm buildings of all descriptions, together with interior and exterior details and interior views. The book has been written as a guide in the selection of a suitable plan of a desired building. These plans were designed by licensed architects and drawn by expert draftsmen. Altogether over 200 modern moderate-priced buildings are illustrated and described.

The details of construction published in connection with the plans give proper measurements and show methods of arriving at desired results which will be of great assistance to carpenters and builders. The interior views show the correct furnishings and decorative effects, giving an idea of how the completed structure looks on the inside as well as the outside.

* *

Does it Spoil a Veneer Brick to Back Fill it?

A subscriber to The Canadian Builder and Carpenter, under date of September 27, asks: "Does it spoil a veneer brick to back fill it? Please let me know through your paper."

In brick veneer construction there are dead air spaces, and the air being a poor conductor of heat keeps the building cool in summer and warm in winter. By filling in the spaces a solid wall is practically obtained which carries to the interior of the building the frosts of winter and the heat of summer. Air spaces in walls furnish complete insulation against atmospheric conditions. It is, therefore, not advisable to back fill a brick veneer wall.

* *

News of Winnipeg Exchange

A delegation from the Winnipeg Builders' Exchange recently waited on Hon. T. H. Johnson, the newly-elected Minister of Public Works for Manitoba. They said it was "just to get acquainted." Actually, it was to ask the Minister of Public Works to consider their side of the case when negotiations are begun in revising the fair wage schedule. They also discussed the project of broadening the provincial labor bureau. The delegates were: W. P. Alsip, president; A. M. Rose, secretary; J. H. Tremblay, F. Rodway, A. U. Cote, J. Bourgeault, J. W. Morley, W. J. Davidson, James Mackie, W. McCartney.

An English gas fire in a fireplace in the Strauvnar Apartments, 102 Tyndall Avenue, Toronto.

Photo by courtesy of The Consumers' Gas Company, of Toronto.

Carpentry and Woodworking

Well Built Corners Prevent Checking of Plaster

In Fig. 1 of the accompanying illustration is shown a method of building up the corners on frame houses. With the construction as shown the three 2x4 in. pieces nailed together give a very neat and strong corner and prevent the possibility of the plaster checking.

A somewhat similar construction for joining a partition to a wall is shown in Fig. 2. The partition is

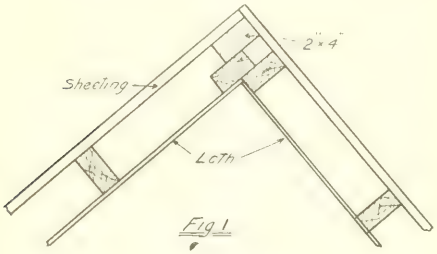


Fig. 1.

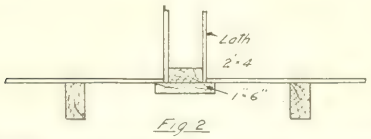


Fig. 2

Fig. 1 shows method of building up the corners of a frame house so as to provide firm support for lath. Fig. 2 shows method used for joining a partition to the wall.

anchored firmly by means of the 2x4 in. piece with the 1x6 in. piece nailed on the back, and a very neat joint for the lath is assured.—L. R. Fretz.

Treating Knots for Finishing

Sash, door and blind, and carpenter shops appreciate that a most important detail of the preparatory work before priming or painting is the "knotting," stopping or killing of knots and pitchy places. Undoubtedly as much or more trouble is caused in painting work by knots and pitchy wood than by any other thing. The object to be accomplished is preventing the appearance of the knots in the finished work, by arresting their absorbent quality, closing their apertures, and preventing the effusion of gum or sap.

Here are two good formulas for this: Mix together ¼ pint japanner's gold size, one teaspoonful red lead, 1 pint vegetable naphtha, 7 ozs. orange shellac. Keep warm until shellac dissolves. The mixture must be frequently shaken.

Another formula is to mix together with a glue size a small quantity of white and red lead powder, and apply warm. The old method has been to shellac the knots. Try these formulas and see if they are not more satisfactory.

Stopping Cracks and Holes in Floors

A favorite way of stopping up the cracks of a floor which is to be left without linoleum or other covering is to mix with glue water paper reduced to a pulp. The objection is, however, that many papers contain chemicals which adversely affect the glue.

One of the best stoppings for the purpose is made by mixing plaster of paris with fish glue water of about one-third strength, and to add sufficient sawdust to bring the composition to a stiff paste. If the space between the floorboards is considerable a knife should be passed along to form a groove to hold the composition when it is pressed into position and prevent it dropping through.

Plaster of paris mixed with fish glue water forms an excellent cement for many purposes.

An Aid to Clean Walls

One of the drawbacks to the white painted wall is the tendency of that white surface to become blackened with finger marks. This shows around door knobs, switches and, frequently, indicating gauges, for the men will put their hands on the wall, if there is half a chance.

To overcome this, and at the same time add to the clean appearance of the room, paint a dark green circle around every switch, or plug, or gauge or knob and, for that matter, at the point where, turning a corner, the men have a way of "following the wall."

In point of fact, follow the finger marks, and wherever they are, paint a green circle.

Have Glass Doors Come to Stay?

Builders and carpenters have not decided definitely whether or not the glass door has come to say. It is a matter of taste with the owner of the house, and the speculative builder is not advised to use glass doors to any great extent. The reason is that the advantages do not offset the disadvantages.

The great advantage is to give a panoramic view of a dwelling and this is all right where the French doors open into a conservatory or perhaps where, in addition to the doors, curtains are used, but many householders consider the above stated advantage a disadvantage. They do not like the idea of having no privacy in a dining room or parlor. In many houses there are arches between hall and parlor, and over this arrange-

[illegible] glass door has many advantages. Generally, however, a builder should not use the glass door too freely unless it is specified by the owner.—P.W.B.

Construction of Lattice, Grill and Trellis Work

Among the interesting items which are included in the numerous list contained in carpenters', joiners' and woodworkers' work is the construction of the details coming under the above caption.

Their uses are various and they are not always met with by the majority of mechanics, but to those whose field of labor perhaps lies in country or suburban districts they oftentimes come within their scope and all should have at least an elementary knowledge of their uses and anatomical construction.

The simplest form of this branch of the business is the open square or diagonal criss-cross lattice, which consists of $\frac{3}{8}$x$1\frac{1}{2}$-inch planed plasterers' four-foot laths, set diagonally and nailed top, middle and bottom to a fixed frame or the underpinning of a piazza, stoop or verandah. The construction of this kind of lattice, whether the laths be placed diagonally or square, is so simple as to require little description, the only essentials being that the laths should be parallel, of uniform widths and thicknesses, and that the spacing—generally equal to the width of the strips themselves—be equal and regular. It is best put together on a floor or perfectly flat surface so as to be "out of wind" and strong. The nails should be wire, thin and long enough so that they can be "clinched" or turned over from the reverse side. When this lattice is enclosing the upper part of a porch, etc., for the purpose of gaining privacy, trellising or training vines and flowers, both sides must be smooth and clean and an occasional screw inserted in various places will add to the rigidity and stability of the surfaces.

Lattice of Curved Design

But lattice, even of the curved design, is often intended to blend into and form artistic patterns with other geometrical woodwork to enhance the effect while forming part of the whole scheme, and might perhaps in these cases be termed "trellis," although this word seems to appertain to the trailing of flowers, etc., and Webster's Dictionary defines this word as "a structure of lattice work."

While it may seem redundant to readers to introduce this item into a technical article, attention might be drawn to the fact that these two words and the constructions indeed themselves are part of and synonymous with the poetry and romance, Shakespeare and other poets frequently introducing them and their reproduction on the stage, which, by the way, necessitates much skillful carpentry work, thus enhancing the effect of the tout ensemble of the scenery; "grill" being usually employed in a verbal sense and essentially a modern word.

Various Combinations Used

Many combinations of grill work are used. There is interlacing of lattice work, although diagonal lattice usually gives a better appearance. In conjunction with turned spindles and supporting pilasters, either of flat or turned and carved designs, various ornamental details may be utilized to improve the appearance of the door or window opening, ordinarily square, flat and without character, into charming portiere openings, which again with the horizontal rods of wood or brass and handsome curtains render any or every opening finished and ornate.

Still further, by introducing the principles and curves of the arch in any outline as circular, elliptic or Gothic, more graceful effects may be obtained, or more complicated designs may be made and inserted, according to the skill of the carpenter or designer; but all should be in accordance with the main design of the building, as for instance, Gothic buildings should have Gothic arches, Moorish buildings Moorish, and so on, and be in good proportion, light, graceful and rigid.

Use Seasoned Wood

There is nothing very difficult in their practical construction.

Any wood from white pine up will do, provided it be clear, well seasoned and free from knots, etc., and straight-grained, the hard woods, of course, being preferable, and all either stained, polished or varnished according to the expense desired to be incurred. By hand or by machine, in the shop or on the buildings, they can be made and with the aid of any of the excellent ingenious machines advertised in building papers their manufacture will be economical and rapid.—"Carpenter."

Glue Scraper Made From Old File

A handy little glue scraper, that the woodworker can carry in his pocket, is made from a worn-out, flat, 10-in. carpenter's file. The file should be broken off at the widest point, near the tang. This can be neatly done by placing it in a vise just where it is to be broken, and hitting the exposed part with a hammer. The file is then heated and bent to the shape required, then hardened by plunging it in cold water, after which it may be beveled and ground on the emery wheel. This scraper will hold a keen edge for a long time and it will be found that its usefulness is not confined to the scraping of glue.

Fibre Board for Walls and Ceilings

Fibre board, made from wood fibre, is manufactured by the Fibre Products, Limited, 95 King St. East, Toronto, in boards 4 ft. wide, 8 ft. long, and $\frac{7}{8}$ in. thick. For the economical use of this wall board the joists are set at 16 in. centres, so that the 4 ft. of the board covers three spaces. It may be sawn to fit any dimensions if necessary.

The advantages claimed for fibre board is that it is a good insulator of heat, cold, or sound; makes a rigid wall; used with practically no waste, and may be decorated or papered as desired.

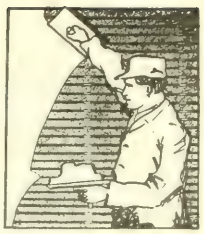
St. Catharines Architect Serving His Country

Joseph Daw, an architect of St. Catharines, Ont., has been granted a commission with the Royal Canadian Engineers, and has secured an appointment on the director-general's staff at Ottawa.

Mr. Daw is one of the best known architects in the Niagara Peninsula and has designed a great many of the houses and public buildings throughout that district.

From time to time plans of several buildings designed by him have been reproduced in The Canadian Builder and Carpenter.

Brick Work and Plastering



Some Brick Information

The Canadian National Clay Products Association adopted two years ago the following standard sizes for brick, which have been adopted by a great many Canadian manufacturers:

Face brick, including stock, dry press and wire-cut face brick, 8⅜ x 4 x 2⅜ inches, which is the same as the pressed brick of the National Brick Manufacturers' Association.

Common brick, 8¼ x 4 x 2¼ inches, which is the same as the common brick of the National Clay Manufacturers' Association.

There is a sort of standard table of calculations for the number of brick required to lay up a given amount of wall space, and this is based on standard sizes in common brick and uniform or average mortar joints of quarter-inch.

Brick Required Per Square Foot of Wall

4 inch veneered wall... 7 brick per square foot
9 inch brick wall.....14 brick per square foot
13 inch brick wall.....21 brick per square foot
18 inch brick wall.....28 brick per square foot

Brick Per Square Yard of Wall

4 inch veneered wall..... 63
9 inch brick wall.....126
13 inch brick wall.....189
18 inch brick wall.....252

As stated above, the basis of these figures as near as can be determined is the standard brick size of 8¼ by 4 by 2¼ inches, with a quarter-inch mortar joint. This would make each layer of brick with its mortar joint practically 2½ inches.

There will be a little variation in brick sizes always because clays vary in shrinkage while drying and burning, and also the shrinkage varies some with different processes of manufacture. What little variation comes from these causes, however, would not amount to much if reasonable precautions were taken to guard against them.

Perforated Brick

In the manufacture of hollowware Canadian manufacturers frequently cut a certain number of blocks so that they may be easily broken apart for corners. The Clayworker tells of a similar idea carried out in brick manufacture in the United States. It is probably not used in Canada commercially, but is of interest to Canadian builders, since Canadian manufacturers have been experimenting along this line.

"There has been for some time more or less making of perforated brick, that is brick with holes in them through their thickness. Investigation of this subject developes two main ideas in connection with it. One is to reduce the weight of of the brick and the other is that it makes a better mortar bond since the mortar will enter into these holes enough to lock the brick together.

"Incidentally, it has been found that perforating brick in this way with holes assists the bricklayer some when he desires to break or cut a brick with his trowel for they will break easily along a line crossing through these holes.

"While this was a minor matter in the original calculations it seems to be a deciding factor in the number and the location of the holes in the brick. For instance, one idea, perhaps the original one, of having two comparatively large holes through a brick, later modified into four holes, has been practically given up because if the bricklayer undertakes to break a brick in half he finds it difficult and quite often the brick will break through the quarter where the hole is located instead of in the centre into two halves.

"This has resulted in a more general turning to three holes and to six holes where brick is perforated. In case the three holes are used the holes are made larger than when six are used and the location in relation to the length of the brick is the same in each case. Also the amount of material removed by the holes is usually substantially the same whether the three holes are used or six.

"Perhaps, after it is simmered down carefully the main advantage found in perforating brick or putting holes through them is that it reduces the weight and in this way helps some where there is a long freight haul involved. Also it perhaps lightens the total weight of a brick wall, but this is seldom taken into consideration as a factor. The main factor is in reducing the shipping weight. It has been found practical to reduce the shipping weight about half a pound. To go further than this with larger holes or more of them weakens the green brick enough that warping and damage results in the kiln, enough to offset the additional advantage gained. So those following the method of perforating their brick with holes seem now to be settling down to either three or six holes and figuring on enough hole space to take approximately half a pound of weight out of the brick."

Amount of Mortar for Joints

The following table shows the amount of mortar required for laying brick:

Joints 3-16 inch require 8 cu. ft. per 1,000 brick.
Joints ¼ inch require 10 cu. ft. per 1,000 brick.
Joints 5-16 inch require 12 cu. ft. per 1,000 brick.
Joints ⅜ inch require 15 cu. ft. per 1,000 brick.
Joints ½ inch require 18 cu. ft. per 1,000 brick.
Joints ⅝ inch require 22 cu. ft. per 1,000 brick.
Joints ¾ inch require 26 cu. ft. per 1,000 brick.

To lay 1,000 brick in lime mortar with proportions of one of lime to five of sand, and joints three-eighths to

[illegible] eighteen cu. ft. of sand.

To lay 1,000 bricks in Portland cement mortar, in proportion of one of cement to three and one-half of sand, and joints three-eighths to half an inch requires one and one-quarter barrels of cement or five sacks and eighteen cu. ft. of sand.

* *

Definition of Porous Brick

With the exception of engineering bricks, all ordinary building bricks are somewhat porous; that is to say, they will absorb water, though the amount so retained in the pores varies greatly with different bricks.

In the south of England the average amount of water absorbed by bricks during complete immersion is about 12 per cent. of the weight of the brick. North of the Trent and in Wales somewhat denser bricks are usual, and the average water absorption is seldom over 8 per cent. of the weight of the brick.

Bricks made by the semi-dry process, that is, by compressing the clay in the form of a damp dust absorb only about 5 per cent. of water, though they vary greatly in this respect. Engineering bricks absorb less

One of the five motor trucks used by the Sun Brick Co. for delivery of brick. Each carries 2,000 brick per trip.

than 1 per cent. of their weight of water. For all ordinary purposes, therefore, it is not desirable to designate bricks which absorb less than 15 per cent. of their weight of water, on immersion, as particularly porous.

During the last few years the use of hollow blocks and hollow bricks has extended rapidly. These are much lighter than solid bricks and effect an important saving in railway carriage, but they must be distinguished from porous bricks. The weight alone is not a sufficient guide, as hollow bricks are now made which are indistinguishable in appearance from solid bricks. Their not be broken their hollowness is easily seen. On the Continent, porous bricks are defined as having a weight which is notably less than common bricks, but this definition will have to be abandoned now that hollow bricks are made in large numbers.

The large, hollow blocks used in fireproof floors, etc., are usually made of a highly porous material. This not only reduces the cost of carriage and the weight of material in the structure, but it facilitates manufacture of blocks accurate in shape and free from twists.

A simple test for porosity consists in holding the tongue lightly in contact with a brick. If a distinct suction is felt the brick will be very porous; if no appreciable suction is apparent, but the moisture rapidly dries from the surface, the brick is but slightly porous. Engineering and non-porous bricks will not absorb water, even if poured on to them.

A much better test consists in weighing a dry brick, immersing it in water for twenty-four hours, wiping it dry with a few rapid strokes of a clean cloth, and then re-weighing it. The weight of water absorbed will indicate the porosity. It is true that the water may not penetrate all the pores, but the test is sufficiently accurate for most purposes.

The bricks used in architecture should be moderately porous, as, otherwise, water condenses from the air, and the resultant water collects in drops on the inside of the walls, spoiling the wall paper and giving the impression that the building is damp. If the pores are sufficiently minute the bricks may be as highly porous as possible. The more porous they are the better will the walls "breathe." Bricks with large, coarse pores should be avoided, as they admit rain water too easily, and walls in which they are used often remain permanently damp.—Building World.

* *

Discoloration in Painted Hollow Tile Walls

Question: "In several cases, where plaster has been applied to the inner surface of our hollow clay tile or clay tile furring, and then painted, it has been noticed that the paint blisters, bubbles or discolors. We have a case at present, in which our tile was used for the walls of a church. The plaster was applied directly to the tile walls, and an oil paint immediately put on the plaster. Large blisters or bubbles—some of them as large as a man's hand—are now forming on the walls, and under these blisters or bubbles, a creamy, granular substance appears that has a decidedly salty taste. There is a great deal of talk about the occurrence, and some interests are trying to blame the tile. We feel that the tile is in no way to blame. We have had numerous buildings erected where a lime mortar is used and in these we have had no trouble with any deposit or efflorescence. Our tile is frequently left on the hack heaps for nine months or more and in no case have we found any discoloration upon it. We do find, however, that when the tile is laid up with cement mortar, an efflorescence appears on the tile around the joints. We have had our tile tested, and the absorption is under two per cent. In the case alluded to earlier in this letter, cement mortar was used, and we feel that the paint was applied to the plaster before it (the plaster) was dry, and perhaps before the cement joint had been given an opportunity to thoroughly dry out. We feel that, in this case, the plaster has absorbed or combined with the salts in the cement mortar joints and has taken the substance that causes the blisters in the paint from the cement. We would like to hear from you as to whether you know anything about similar occurrences and whether or not there is a way of preventing them. We have suggested the use of a waterproofing compound in the mortar, but several masons and plasterers, with whom we have consulted, tell us that there is no satisfactory waterproofing compound made that

can be used in this way. They say that the only satisfactory treatment is to use a waterproofing paint, applied directly to the entire inner surface of the tile wall, and as we all know, this is too expensive a process to be considered as a commercial proposition, at least in a large number of building enterprises."

The following answer is given by Brick and Clay Record:

We are of the opinion that the trouble which has arisen in the case mentioned is due entirely to the paint having been applied to the plaster before the latter had been thoroughly dried, and that the blisters in the paint were caused by the evaporating moisture in the plaster (and perhaps, the joint) which was seeking an outlet. Plaster is, and has been applied directly to the inner surface of tile walls, all over the country, and so far has given very satisfactory results, the case cited by our correspondent being one of very few that have come to our notice. This opinion is strengthened by the fact that the correspondent's tile has a very low absorption—much lower than the average. This, and the fact that he has never had any efflorescence appear on the tile that was hacked in his yard—even after an exposure of more than nine months—is pretty good evidence that the treatment, and not the tile, is at fault. It looks very much as though the blistering was due to some constructional fault and this may be the use of cement with tile of so low an absorption. The fact that the tile takes comparatively none of the moisture from the cement leaves only the inner and outer surfaces of the joint as points where the excess moisture can escape. It may be that the outer surface of the joint dried out much more quickly than the inner surface, particularly as this inner surface was again wetted when the plaster was applied to it. Capillary attraction may have been set up that brought out all of the salt that was in the cement, or in the water with which the cement was mixed and that the plaster would have been scummed, even if not painted. This thing has happened in buildings where impervious paving brick were used and where plaster was applied without furring. In that case it was clearly the fault of applying the plaster before the cement joint had been given an opportunity of drying out, and was caused by the church committee insisting upon the contractor turning over a finished building within a certain specified time. In the case cited by our correspondent, the moisture in the plaster was held back by the comparatively impervious paint film that was put on by the decorator, and the conditions made so much the worse. With regard to the appearance of efflorescence around the cement joints, it would appear that this is a problem that can be solved by the use of barium.

Decorative Value of Terra Cotta

Terra cotta is being used in the United States for decorative purposes, and to a slight extent in Canada. Some of the hotels in the United States are finished in terra cotta with long wall panels of superb color and design. The theme in the decoration of the dining room in one hotel is the portrayal of their own city as the gateway to the North-west.

The colors are soft and subdued and the process of firing the material in the kilns brought everything to a richness that could have been secured in no other way. There is an interesting panel, also, that shows an exceptionally beautiful view along the lordly Mississippi, and a view of the great Missouri in its upper courses winding downward from the foothills. Then come the buttes of Montana, first glimpse of the Rocky Mountains, and many other charming vistas associated with that section of the country.

The decoration of the various panels is executed by what is known as the airbrush and "slip" method. The "slip" is prepared clay of a soft creamy consistency, and it is squeezed through a fine tube directly on to the surface to be decorated. The delicate colors are air-brushed on afterwards.

Gifts of Special Building Materials, Catalogs, Etc., Wanted for Toronto's Technical School

It has been the aim of the Toronto Technical School authorities to make classes of greatest practical use and keep them in as close touch with the trades as possible. With this in view, samples of new building materials and shapes, such as floor and roofing tile, sanitary cove, rough texture brick, ornamental terra cotta, etc., are used as models for class and drafting instruction.

Several companies have donated such materials, and with the idea of broadening the knowledge of the student, it is desirable that other concerns contribute additional samples of materials, such as a student would not ordinarily see in taking a course in building construction or architecture. Tags on the articles, giving names of manufacturers, will not be disturbed, and the manufacturers' names will be mentioned in the lectures where these are used for demonstration purposes.

It is of special interest to note in this connection that a room has been set apart as a museum of building materials. This room adjoins the building construction rooms and is fully provided with cases, shelving, etc., for the proper display of the materials and articles.

Other acceptable material which would be of great value to the instructors are trade catalogues and illustrated matter, which would be kept in special files for the purpose, also photographs of machinery used in the building trades. Many views of machines have been framed and give a proper atmosphere to the class rooms devoted to the building construction and architectural courses.

Companies willing to make such donations are asked to communicate with Vice-Principal W. S. Kirkland, Central Technical School, Lippincott Street, Toronto.

A Brick from Heaven

A negro bricklayer in a Southern city was lying down during the noon hour, sleeping in the hot sun. The clock stuck 1, the time to pick up his hod again. He rose, stretched and grumbled: "I wish I wuz daid. 'Tain' nothin' but wuk, wuk from mawnin' tell night."

Another man, a storey above, heard the complaint and dropped a brick on the grumbler's head.

Dazed, he looked up and said:

"De Lawd can stan' no jokes. He jes' takes ev'rything in yearnist."

The New Natco Manager

When we use the word Natco we naturally think of the National Fireproofing Co., so that when we apply the name Natco manager to Millard F. Gibson we know that we shall find him in the offices of the company in the Dominion Bank Building, Toronto, when he finds he needs a rest and puts out his fan in attending to the sporting duties connected with the office. We are speaking of his quality of personal geniality when printers' ink is concerned, but know those in the clay products field, including manufacturers and dealers, will welcome being introduced to the new Natco manager.

Mr. Gibson isn't a new Natco product by any means. He has been employed at several of their plants and came to Canada from their plant at Haydenville. He is well informed on shales and clays and their treatment. In fact, a man widely known in the clay products field says he is one of the best men in the clay industry in Canada, and from what we have seen of Mr. Gibson at conventions and from what we have heard from clay workers we are quite willing to agree with the statement. That was probably why he was appointed as the National Fireproofing Company's large tile plant at Aldersnot, near Hamilton.

Boosting Production at the Factory

The plant was started in 1910 when the late Charles L. Watson was general manager for Canada. When it was found, two years later, that a ceramic engineer was required to handle the plant, Mr. Gibson was sent over from Haydenville, where he had spent two years as general superintendent.

Greater production was required to take care of the rapidly-growing business. It was "put up" to Mr. Gibson, and as the words "can't be done" are not in his dictionary he was equal to the task. Up to June, 1913, the output was only 900 tons. In sixty days the output, with the same men and facilities, reached 2,100 tons, and now a 3,000-ton output can be steadily maintained when desired. About 325 shapes and sizes are turned out, and these are used in the finest buildings in Hamilton, Toronto, Ottawa, Montreal, and in towns too numerous to mention.

Displays Energy and "Head" at Work and Play

It isn't all sunshine keeping a large plant and organization in "fit" condition, but as Millard is somewhat of an athlete and a very hard systematic worker, his shoulders are broad enough to carry the load and keep any of the aims from getting rheumatic.

Baseball, basketball, football and rowing have all found their place in his life. "All work and no play finds Jack a dull boy," so he keeps his spirits up managing the football team of the Hamilton Rowing Club and by turning an eye occasionally towards the diamond, if the Hamilton Club, of which he is vice-president, happens to be playing at or near home. When he was a boy he made quite a reputation for himself as a fine full back, and even at Ohio State University he could put over a worthier steel.

The same enthusiasm and energy are manifested in his business world, and no one ever tries to "put one over" a second time. In this connection he once objected to the quality of a car of coal which was delivered at Aldersnot. The agent, writing to his principals made a statement something like this: "Gibson knows all there is to know about coal. Send according to order in future." Well, he does know a lot about it. Naturally, being brought up in the Hocking Valley coal district he imbibed a little knowledge of coal, which makes him able to tell whether he is getting what he ordered or not.

Graduate of Ohio State University

Mr. Gibson graduated from Ohio State University at Columbus, of which J. J. Orton is dean, in 1908, but before and during the course he spent considerable

Millard F. Gibson, General Manager of the National Fireproofing Co.

time at coal clay products plants. His first job after graduation was with the company now known as the Hocking Valley Clay Products Co., Greendale, Ohio. He started in shoveling clay, but when he left, a year and a half later, he was assistant superintendent. He went to Haydenville in 1910, and was general superintendent at the National Fireproofing Company's plant in Dunnville 1912 when the Union Jack began to fly over his head.

His success has been due to "knowing how," whether it is actual knowledge of facts or whether it is utilizing other people's knowledge as well as his own. This made him a good man in dealing with and overcoming difficulties and in tackling new propositions. If the National Fireproofing Company are looking for a broadening out of their energies they will find their confidence well placed in the new Natco manager.

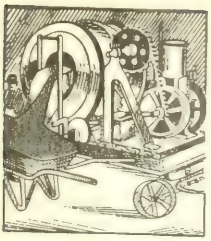
* *

Estimating Plaster Work

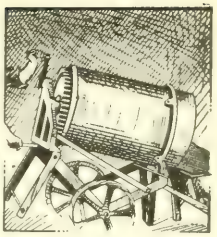
According to the standard rules for measuring plastering adopted by the Employing Plasterers Association of Chicago, Ill., no deductions are to be made for openings of 2 ft. or less in width. One-half of the area is to be deducted for openings more than two feet in width and all openings are to be measured between grounds.

The area of all store front openings is to be deducted and the contractor to be allowed 1 ft. 6 in. for each jamb by the height.

Other rules for measurement allow one-half the area of openings for ordinary doors and windows, while some make no allowance for openings of less than seven square yards.



Concrete Department



Outdoor Storage Cellars

A subscriber has asked the Canadian Builder and Carpenter for information on outside cellars. In reply to him and to our readers generally the following article is published on a concrete storage cellar.

In cold climates outside storage cellars afford the best and cheapest winter storage for fruit, vegetables, and bees. They are just as valuable in summer for keeping berries, milk, and butter.

Building the Walls and Floor

The most popular size for the average farm is a cellar 10 by 14 feet, inside measurements, with a self-supporting arched roof 5 feet above the floor at the sides and 7 feet 8 inches in the centre. All of the side walls are 8 inches thick, therefore dig the hole 11 feet 4 inches by 15 feet 4 inches and to the depth desired, usually 5 feet. At one end cut out the earth to a width of 4 feet 4 inches and slope it upward for seven concrete steps with a rise of 8 inches and a tread of 10 inches and for a thickness of 4 inches of concrete back of the steps proper. Arrange for an 18-inch landing at the bottom of the stair.

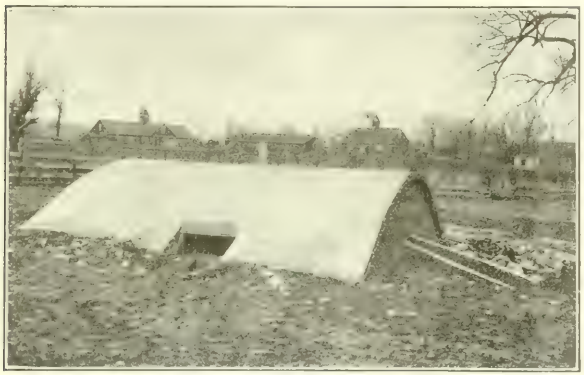


Fig. 1.—Concrete outdoor storage cellar, 18 x 18 x 8 ft. deep.

Make the sidewall forms of 1-inch siding on 2 by 4-inch uprights spaced two feet. As the concrete floor will be 4 inches thick, set up the forms on 4-inch concrete bricks. Above ground level use outside forms similar to the inside. To curve the end wall forms, lay them out with a 6-foot string in the same way as described below for arch rings. At the entrance end, to provide for a doorway, set between the forms a frame of 2 by 8-inch stuff 3 by 7 feet in the clear. Mix the concrete 1 part Portland cement to 4 parts bank-run gravel, or 1 part cement to 2 parts sand to 4 parts crushed rock. A sack of cement equals 1 cubic foot.

With the forms in place, lay the 4-inch floor the same as a sidewalk, but without joints. Fill the wall forms in 8-inch layers with mushy wet concrete, and 6 inches from the top of the side walls and 1 inch from the outside, place two ⅜-inch steel rods the full length of the cellar. In the concrete two inches above the door-frame, lay three four-foot lengths of ⅜-inch rods. Roughen the top of the walls so as to insure a good bond with the roof. Build the stairway with a 4-inch thickness of concrete behind the steps proper. Each step has a tread of 10 inches and a rise of 8 inches. The sidewalls of the cellar hatchway extend above the door opening of the cellar proper, so that outside sloping doors may be added. In the top of the hatchway walls, while the concrete is soft, bolts are set heads down for holding the wooden sill to which the strap hinges are later attached.

The Self-Supporting Roof

When the sidewalls are one week old, begin on the roof. To give the roof a rise of 2 feet 8 inches, arch rings are needed. For laying out the rings, choose a floor or a bit of level ground. To one end of a strong string fasten a pencil and tie the other end to a nail driven firmly in the floor with exactly 5 feet 11 inches of string between the pencil point and nail. Mark out half a circle. Across the circle lay a board exactly 10 feet long, so that its ends just touch the mark. The part of the circle above the board represents the arched inside of the roof. Place boards for the arch rings over the mark on the floor and nail them together. Mark the curve upon them and cut them to the mark. Brace the arch well, as shown in the drawing. Spacing the rings two feet apart, six will be needed. Fasten them securely in place to 2 by 6-inch liners spiked to the sidewall forms. Cover the rings tightly with 1-inch sheathing.

With the roof form ready, place the reinforcement upon it. Use ⅜ rods 14 feet long. Space them 6 inches apart crosswise and 12 inches the long way of the cellar. Wire the rods together where they cross. The roof must be 5 inches thick. Carefully work exactly 1 inch of concrete between the rods and the sheathing. Tamp the concrete until the liquid cement flushes to the top and then finish the surface smooth by means of a wooden float and steel trowel. Do not stop for anything until the roof is finished. In two or three weeks the concrete roof will be strong enough to support itself; then the forms may be removed.

Ventilation is necessary for most cellars. While building the wall make one or more airshafts (similar to a chimney flue) of 3-inch tile, by imbedding them in the concrete wall, with an opening inside at floor level and another outside well above ground line. By this arrangement fresh air is admitted. Place a tile chim-

iron hood for removing the foul air. If built late in the fall, protect the fresh concrete from freezing by covering it with clean straw or with old carpet, so suspended as to leave a dead air space between the concrete and the covering.

Below is given a list of the materials required. The prices are higher than in most localities. If good screened pit gravel is used, no sand will be needed.

Bill of Materials*

Crushed Rock, 13 cu. yds. at $1.10	$14.30
Sand, 6½ cu. yds. at $1.00	6.50
Portland Cement, 22 bbls. at $2.50	55.00
Rods, 40 pieces, ⅜"x14', 206 lbs. at 2¼c.	4.65
Total	$80.45

*Consult local dealer for prices.

The cellar shown in the photograph is 18 by 18 feet by 8 feet deep. It is located on an apple farm. The owner finds it a profitable investment, as he has his own storage and keeps his apples until the market is no longer glutted with "wind-falls" and "seconds."

Use of Cinders in Concrete

Cinders as an aggregate in concrete work should be used with discretion. Cinder concrete is not strong, and where strength is required should never be used. As a rule, it should never be used in reinforced work which comes in contact with water, as it is more or less porous, and hence does not protect the reinforcement from corrosion. Due to the fact that it is possible to procure cinders so cheaply, the pilasters and wall might be built of cinder concrete, reinforcing it as specified, if the surface were stuccoed thoroughly to keep out the penetration of the rain. The wall, however, would not be so strong as one built with stone or gravel as the aggregate.

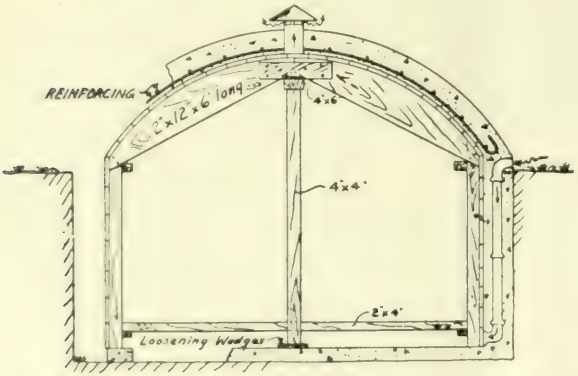


Fig. 2.—Framework for constructing outdoor storage cellar of concrete.

As to the possibility of moulding copings in place of using plaster of paris moulds, we should consider it advisable to mould the coping and decorative shapes for the pilasters separately and place them on the cast pilasters.—M. Boyer, in Concrete-Cement Age.

Materials for Coating Concrete Forms

Common whitewash is a fine material with which to coat forms. It would be difficult to find anything cheaper, and it is really very efficient in preventing concrete from adhering. If concrete is poured against dry forms large areas of surface will be pulled off with the forms, so that some coating is necessary.

In the order of cheapness and merit the coatings stand about as follows: Water, whitewash, soap, oil. In the order of practicability during the filling whitewash, soap, oil, water.

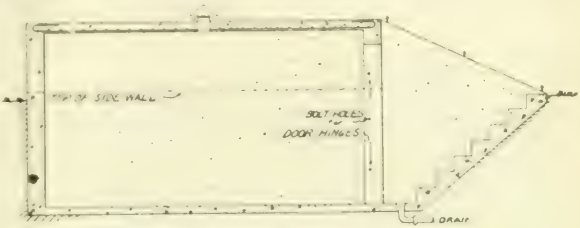


Fig. 3.—Stairway leading to storage cellar.

The stopping of joints which open in forms is accomplished by the use of water to cause the wood to swell and partly by filling the joints with some material. The writer has found nothing to equal mud paste. A clay of some sort can generally be found in the vicinity of every concrete job, and it is an easy matter to mix it with the paste and fill all cracks. Sometimes a long time intervenes between the placing of the clay and the pouring of the concrete, so the clay dries up and falls out.

Some contractors use thin oil with which to mix the paste, instead of water, and this is generally satisfactory, while others use thin soap or very heavy soapy water. This is cheaper than oil, and much more readily mixed with the clay. Some fibre or hair mixed with mud paste makes it possible to use it in filling quite large cracks, although the use of fibre is not common. This has been used on several jobs with great satisfaction.

Laying Cork Flooring on Concrete

The Canadian H. W. Johns-Manville Co., Toronto, give the following information on the laying of cork flooring. The information was prepared by Mr. F. B. Green, in charge of the cork tile department of their U. S. plant.

"In applying cork tile flooring to concrete we use two methods, according to conditions. On new work, in which we furnish the under floor or can dictate its composition, we lay on the concrete floor slab while still green one inch of asbestos concrete, composed of one part Portland cement, one part asbestos fibre, and three parts sand. This is troweled to a true surface with a sidewalk finish, half inch below the finished floor level. This composition makes a fibrous bed which will hold a nail.

"When this is thoroughly dry, the cork tile are applied, being first bedded in a special waterproof mastic. They are laid by a method which closes and cements all joints, at the same time distributing the pressure evenly

over the surface. The tile are bradded into place with headless brads, which are driven below the surface of the tile and hold them in place while the mastic is setting up, which requires about twelve hours. On hard concrete or any other surface into which nails cannot be driven, the tile are weighted into place. The result is the same in both cases, but in the latter more time is required, and it is somewhat more expensive in consequence."

Making Concrete Waterproof

R. L. Parshall, of the Colorado Agricultural College, writing in a farmers' magazine, says that to increase the water tightness of concrete, especially to lean mixtures, clay may be added. The clay must be free from all vegetable matter and when added must be in a finely powdered state. The amount to be added must vary with the mixture; for ordinary farm work add about two to five per cent. of the weight of sand used in the mixture. Mix dry with the cement.

The addition of soap and alum to cement mortar has been found to diminish its permeability, and the following has been found to give good results: "Take one part cement and two and one-half parts of clean, sharp sand, and to every cubic foot of sand add three-fourths of a pound of powdered alum. This should all be mixed dry. Now add water in which has been dissolved about three-fourths of a pound of ordinary laundry soap to the gallon, and thoroughly mix." If you find it difficult to dissolve the soap, use hot water. The strength of the mortar will of course be somewhat inferior to that of the pure mixture.

Alum and lye applied to the exterior surface with a calcimining brush has been found effective. Use a pound of lye and three pounds of alum dissolved in two gallons of water.

A very effective method to prevent moisture penetrating through walls that extend beneath the surface of the ground is the application of two coats of coal tar to the exterior surface of the wall, the coating to extend well above the surface of the ground.

Standardizing Rating of Concrete Mixers

Up to the present time there has never been any standard method of rating batch mixers. Some mixer manufacturers rate their machines by their capacity in mixed concrete, while other manufacturers rate them by their capacity in loose unmixed material. It is a well known fact that a mixer having a batch capacity of 8-9 cubic feet of unmixed sand, stone and cement will hold only about 6 cubic feet of mixed concrete per batch. For this reason the term three, four, or nine-foot mixer has never had any real, definite significance.

The National Association of Mixer Manufacturers, at their August meeting, took steps toward remedying this difficulty by adopting a resolution providing for the uniform rating of batch mixers. This resolution provides that the members of the association in future catalogues and circulars shall specify the capacity of their mixers as "size of wet, mixed batch," and not otherwise. The resolution further provides that the dry unmixed capacity of a mixer may be approximated as one and one-half (1½) times the wet mixed batch, assuming the use of cement, sand and one and one-half (1½) inch crushed stone, with 1¾ gallons of water per cubic foot of mixed concrete. The members of the association further agreed not to use the dry batch rating in their correspondence, advertising, etc., unless the standard wet batch rating were used also and with equal prominence.

The step taken is a very desirable one from the viewpoint of the probable buyer and is one that will prove beneficial to all contractors, mixer manufacturers, and everyone in fact connected with the concrete and cement industry. A contractor can arrive at a real comparison between mixers, not only in price but in capacity. This is difficult without a standard rating.

H. E. Smith, 1125 Thirty-second Street, Milwaukee, Wis., is secretary of the National Association of Mixer Manufacturers.

Cement Sack Sense

A sack that carries its contents from the mills of the manufacturer to the ultimate purchaser, that is properly untied, that is kept clean and dry, that is not used as a covering for concrete nor as a tool-chest, nor as a knee, foot or back protector, nor as a hod-pad, nor as a shoe cleaner, and that, having thus once served its legitimate purpose, finds its way back to the mills of the manufacturer within a reasonable length of time—such a sack is again available for use and is worth the sum of 10 cts.

A sack that, upon its arrival at the job is opened with a shovel, that is used to plug holes in the water barrel, that is used as a sun-shade for concrete in summer and as an overcoat in winter, that likewise serves as a workman's apron or tool receptacle, and that is commissioned for other miscellaneous purposes just because it is handy, that becomes dirty, wet and even torn in places—the value of such a sack has reached the zero mark and, consequently, the needless labor of collecting, sorting, counting, bundling and tying sacks so improperly used should be avoided, and the freight on their return saved by the man who purchased and used the cement.

How to Select an Architect

The most satisfying manner by which to select an architect is to investigate into his reputation, experience, standing in his profession, his accessibility and general fitness for any particular work, and select him on these grounds. Co-operation among the architects would bring about a condition of this kind. With such a condition existing there would be less need for architects to solicit work and they would have more time to devote to its proper execution. Both they and the public whom they serve would be thus benefited. Under such conditions the architects could work with their clients, and not at them.

Many times reinforcement and especially light bars, expanded metal and wire fabric are laid upon the forms and then afterwards manipulated by a hook as the concrete is placed, jerking the reinforcement upward so that the concrete may flow underneath. This is dangerous, inasmuch as there is no gauge to determine the final position of the reinforcement and if the concrete flows under the reinforcement in too large a quantity it is almost impossible to replace the reinforcement without re-building the entire work.

Price List of Building Materials Revised to Date

EDITOR'S NOTE—Great care is exercised in obtaining prices for this department. They are as accurate as it is possible for us to make them. We know, however, that because of varying conditions, different dealers' prices are bound to vary somewhat; and our purpose in publishing this department is to give readers an idea of prices, rather than absolutely definite information.

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.	20.00 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
⅝ 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	17.00
No. 1 dry pressed buff bricks	21.00
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)	1.90 bbl.
Sand, for cement or brick work	.95 ton
Lime	.38 per 100 lbs
Hydrated lime	10.00
Mortar color	5.00 bbl.
Plaster of paris	2.35
Crushed stone 2 in.	1.40
Crushed stone, 1 in.	1.60
Crushed stone, ¾ in.	1.75
Hardwall plaster	$9.50 to 12.00 neat
	6.50 sanded ton
Gravel	1.35 yard
Hair (plaster)	.03 per lb.

PRICE AT TORONTO

Hemlock Lumber

2 x 4 in. to 2 x 12 in., 8 to 14 ft.	$21.00 to 29.00
2 x 4 in. to 2 x 12 in., 16 ft.	21.00 to 29.00
2 x 4 in. to 2 x 12 in., 18 ft.	24.00 to 30.00
1 in. hemlock No. 1	22.00 to 26.00
No. 1 hemlock decking	24.00 to 28.00
No. 2 hemlock dimensions and 1 in.	18.00 to 23.00

Pine

1 in. common and better pine 8 to 12 in. wide, rough	$25.00 to 33.00
2 in. white pine, mill stock	29.00 to 34.00
⅝ x 8 and 10 in. pine shelving	33.00 to 40.00
⅞ x 12 pine shelving	45.00 to 48.00
No. 1 white pine flooring	34.00 to 37.00
No. 1 spruce flooring	27.00 to 32.00
No. 1 pine decking, D2S	26.00 to 31.00
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.	$24.00 to 30.00
2 x 4 in. to 2 x 14 in., 18 to 20 ft.	29.00 to 38.00
2 x 4 in. to 2 x 14 in., 22 to 24 ft.	31.00 to 40.00

Yellow Pine Finish

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

Hardwood Trim, Flooring, Etc.

Quotations will be given on request.
See editor's note above.

Shingles, Lath Roofing Etc.

XXX B. C. cedar shingles	$3.35 per M
N. B. extras	4.00
No. 1 pine lath	5.00 to 6.00 per M
No. 2 pine lath	4.75 to 5.00
No. 1 spruce lath	4.25
Roofing	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	2.00
Tarred paper	.60 roll
Building paper, plain	.50

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*

Glass

Size	Star	D.D.
Up 25 (per 100 sq. ft. box)	$6.50	8.60
26-40	$7.00	10.00
41-50	7.40	11.70
51-60	8.00	12.00
61-70	8.75	12.75
71-80	9.50	13.85
81-85	10.50	17.50
86-90		18.85
91-95		19.20
96-100		22.75
101-105		32.00
106-110		36.00

Less 20 p.c. 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 18.00 per M
No. 1 dry pressed buff bricks	14.50 to 18.00
Red stock bricks	10.00 to 12.50
Sand lime brick	8.50
Grey stock bricks	10.50 to 12.50
Sewer brick	8.75 to 9.50
Wire cut brick for foundation work	8.00 to 9.00
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
Sewer pipe, 4 inch	10c. foot
Sewer pipe, 6 inch	16c. foot
Verandah post caps, 16 in.	1.45 each
Verandah post caps, 20 in.	1.75 "
Chimney caps, 1 flue in 1 piece	2.00 "
Chimney caps, 2 flues in 2 pieces	3.50 "
Chimney caps, 3 flues in 3 pieces	5.00 "

Cement, Plaster, Stone, Etc.

Cement (bags extra)	$1.85 bbl. (1.55 in car lots)
Sand, for cement or brick work	1.20 a yard
Lime	.38 cwt.
Hydrated lime (Canadian)	10.60 ton
Hydrated lime (American)	11.60 "
Mortar color	black, 3; red 2
Plaster of paris	$1.50 to 2.50
Crushed stone, 2 in.	1.20
Crushed stone, 1 in.	1.25
Crushed stone, ⅜ in.	1.25
Hardwall plaster	9.10
	5.00 sanded
Gravel	1.50
Hair (plaster)	.07 lb.

PRICE AT WINNIPEG

Hemlock Lumber

2 x 4 in. to 2 x 12 in., 8 to 14 ft.	$20.00
2 x 4 in. to 2 x 12 in., 16 ft.	20.00
2 x 4 in. to 2 x 12 in., 18 ft.	20.00

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	$3.70 per keg
Nails, cut, common	3.70
Sash weights, cast iron	2.75 cwt.
Tarred felt paper	1.00 per roll
Building paper	.75
Insulating paper	1.25

Price at Winnipeg—*Continued*

Glass

Size	Single	Double
Up 25	$6.00	8.00
26-40	6.50	9.00
41-50	7.00	10.25
51-60	7.50	11.00
61-70	8.00	11.75
71-80	8.50	12.75
81-85		15.75
86-90		16.75
91-95		17.75
96-100		21.00
101-105		23.50
106-110		27.00

Brick, Tile, Terra Cotta, Sewer Pipe

No. 1 dry pressed red bricks	$25.00 to 50.00
No. 1 dry pressed buff bricks	30.00 to 40.00
Red stock bricks	25.00
Sand lime brick	12.00
Porous terra cotta bricks	18.00 per M
No. 1 enamelled bricks, all colors, from	100.00
Fire brick	52.50
Oriental brick	35.00
Sewer pipe, 4 inch	.11 per ft.
Sewer pipe, 6 inch	.18½ per ft.

Cement, Plaster, Stone, Etc.

Cement (bags extra)	$2.60 per bbl.
Sand, for cement or brick work	1.85 a yard
Lime	.34 per bu.
Hydrated lime	12.00 per ton
Mortar color	.05 per lb.
Plaster of paris	.75 per bag
Crushed stone, 2 in.	2.65 per yard
Crushed stone, 1 in.	2.90
Crushed stone, ⅜ in.	2.90
Hardwall plaster	13.00 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	$42.00 per M
No. 1 dry pressed buff bricks	42.00
Red stock bricks	13.00
Fire brick	45.00
Sewer pipe, 4 inch	.25 per ft.

Cement, Plaster, Stone, Etc.

Cement (bags extra)	$3.00 per bbl.
Lime	1.35 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

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