The Canadian Builder

A Practical Paper Devoted to all Branches of the Building Trades

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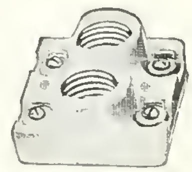

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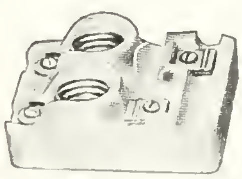

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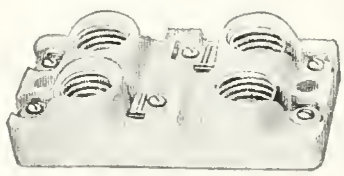

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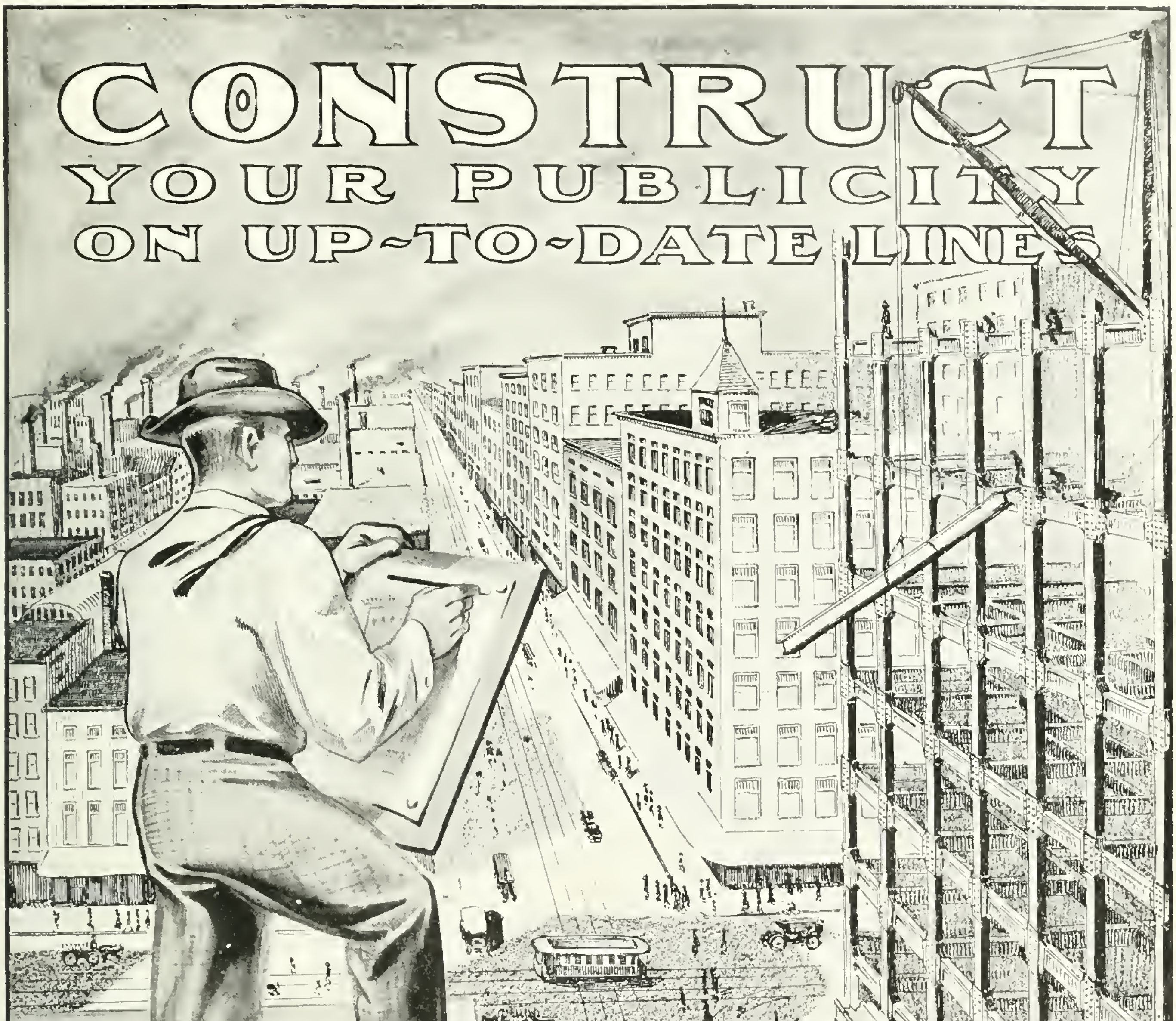
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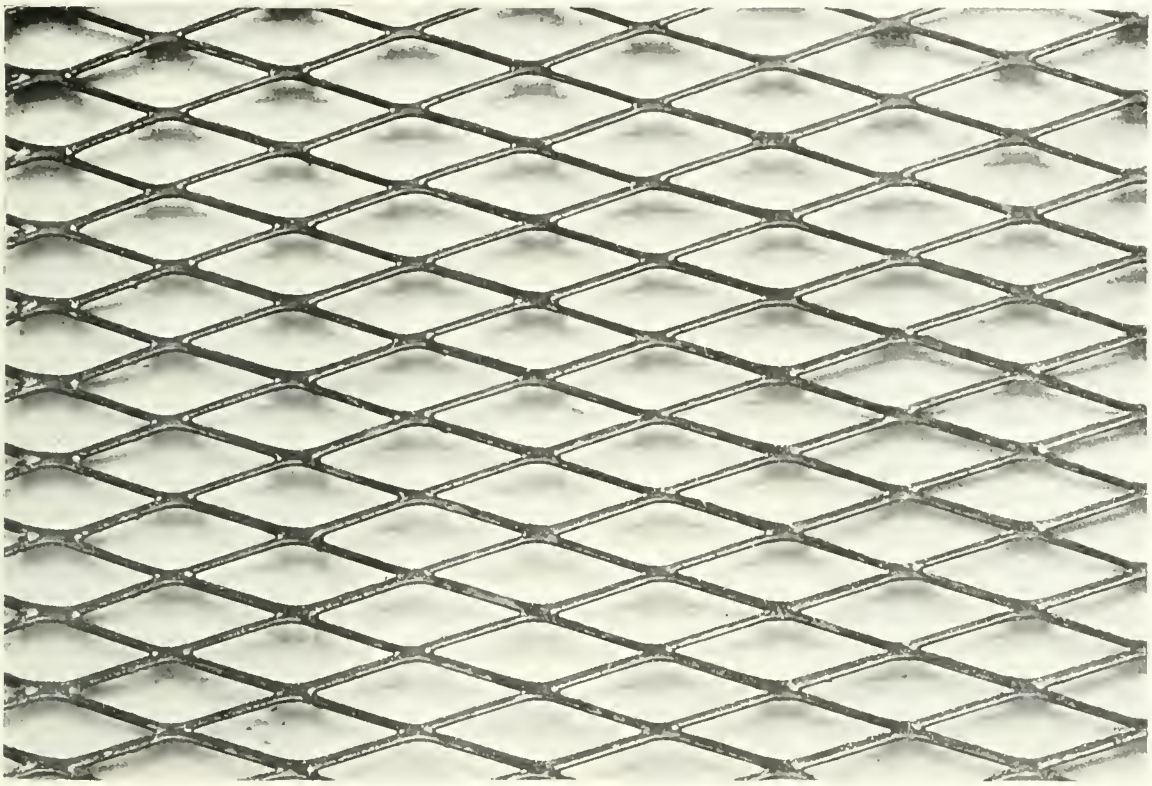

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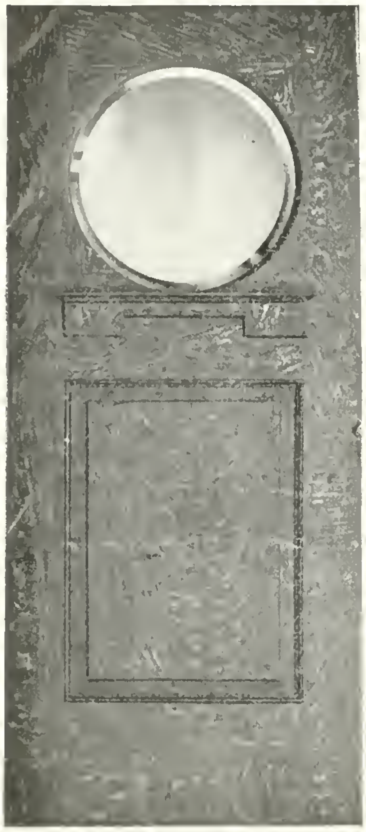


The Sharpening of Woodworking Tools

A Valuable Artitle for the Practical Workman from "The National Builder"

The tools used for woodworking are ground and sharpened to more acute angles than those used for cutting harder substances, such as metal. The most suitable angle for any given tool is decided by the character of the material it has to cut. As there is a considerable difference in the hardness of different kinds of wood, the tools used for cutting it vary also in their cutting angles, tools used for soft wood being more acute than those for hard. This does not mean that tools must be kept specially for each kind of wood, or must be reground to suit each. A patternmaker working with soft pine or a joiner working chiefly with whitewood or cypress would sharpen their tools suitably for these woods and use them on hard woods occasionally, but if their work was chiefly with hard wood they would find the tool edge too acute. They would become dull very quickly, and if heavy cuts were taken would get broken and notched. A more obtuse angle would give a more durable cutting edge.

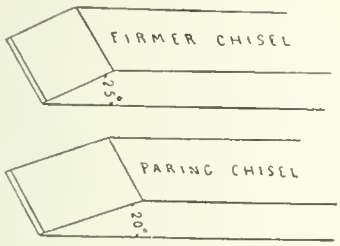


Figure 1

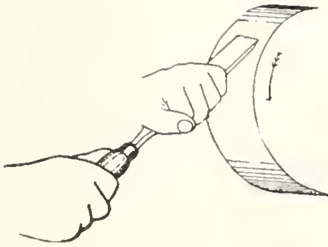


Figure 3

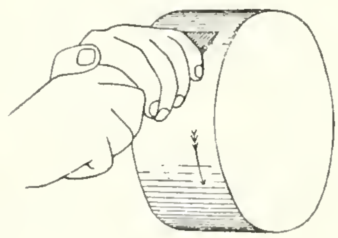


Figure 4

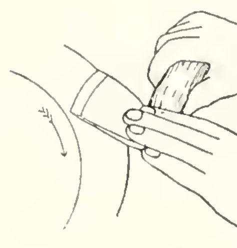


Figure 5

Fig. 1 shows two chisel edges, one ground for hard wood and the other for soft. Another reason for the difference is that the firmer chisel is intended for rougher work than the paring chisel, and is often driven with a mallet. It is the chisel used for ordinary work, and is shorter and thicker than the one intended for paring. The difference in their angles is often greater than illustrated. The angles are not measured in any way, but the workman judges by his eye when they are about right as he grinds them.

In all cases the angle of sharpening on the oilstone has to be more obtuse than the grinding angle. This is necessary in order to save labor and time in sharpening. The ground facet of a chisel extends perhaps half an inch from the edge, and if this facet was laid flat on the oilstone and rubbed till the edge was keen, it would be a very slow process, for the oilstone cuts very slowly indeed, compared with the grindstone. By

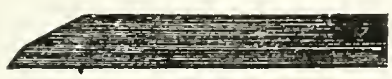


Figure 2

tilting the chisel slightly a very narrow facet is rubbed, just sufficient to make the edge keen and leave most of the ground facet untouched. This narrow facet made by rubbing on the oilstone is shown by the double lines close together at the edges of the chisels in Fig. 1. After repeated sharpenings without grinding the chisel edge becomes thick, as in Fig. 2, and regrinding is necessary. The sharpening angle on a newly ground tool can be almost the same as the grinding angle; but as the edge wears back, as in Fig. 2, the chisel has to be tilted more and more on the oilstone to avoid a wide sharpening facet.

Grinding is a simple matter, requiring chiefly a knowledge of the most suitable angle to grind it. It is done either on a grindstone or emery wheel. In the latter case great care must be taken not to heat the tool. The pressure must be very light and the tool should be frequently removed and examined. An emery wheel on which water can be used is preferable to a dry one. A grindstone cuts slowly and the pressure on the tool must be comparatively heavy. Water is always used on it to prevent the stone from glazing. A person accustomed to the work will grind a tool more neatly than a beginner. The facet should be straight and uniform, not broken up into a number of flats with an edge perhaps not keen or not straight. In the latter respect a plane-iron is much more difficult to deal with than a chisel because of the greater width and the necessity of a correct edge, slightly curved, or bellied, more or less according to the kind of plane. A chisel can simply be ground straight at its edge, and it does not matter if it is not quite at right angles with

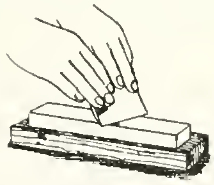


Figure 6

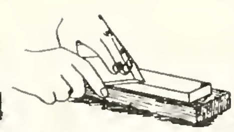


Figure 7

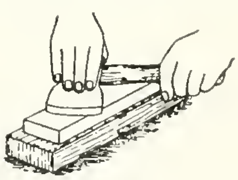


Figure 8

the sides of the chisel. Figs. 3, 4 and 5 show tools being ground—a chisel, plane-iron and hatchet respectively. They are generally moved to and fro sideways on the stone to lessen risk of glazing and unequal wear. It is usual to let the stone revolve towards the tool, so that burr which forms when the edge is thin shall not cling and make it difficult to properly examine the edge as the grinding proceeds.

Grinding leaves a rough edge quite unsuitable for cutting wood, and it must be followed by sharpening on an oilstone and in some cases still further by stropping on leather. Some workmen use two oilstones, one coarse and the other fine; but one stone of suitable grade is sufficient unless a very wide range of work is done. It is a waste of time to put a very keen edge on a tool used for rough work. A coarse, quick-cutting stone should be used for the purpose. Carpenters and joiners use coarse and medium stones, of which there is considerable variety, both natural and artificial. The Canada is a popular stone because it is cheap, but it wears away fast. The Charnley Forest is a well-known English stone, very durable, but rather slower cutting than some workmen like. The Yellow Lake is another very much like it, but slightly cheaper and quicker. The Turkey stone is quarried in Turkey. It is rather expensive and brittle, and too fine for most classes of woodwork. India stones are artificial, made in three grades, and are expensive. The Washita is a popular American stone of good quality at moderate price. The Arkansas is the most expensive stone on the market and is the best for very fine work. It is too slow and too costly for the average woodworker. Now, however, all ordinary stones seem to be obsolete, as Carborundum has the advantages of much faster cutting surfaces, and being an artificial product is made in a number of grades of fineness, from coarse grinders to the finest razor hones.

In using an oilstone a little oil is put on its surface and the tool, tilted to the correct angle, is rubbed backward and forward on it with moderate pressure. At intervals it is turned over, and the other face of the steel rubbed slightly to remove burr. Figs. 6 and 7 show these two operations with a plane-iron. A chisel is treated similarly. Fig. 8 shows a hatchet being sharpened. This, being ground on both sides, must be tilted accordingly for sharpening instead of lying flat one way, like the plane-iron in Fig. 7. For splitting wood it is not essential to do more than grind a hatchet, but as a rule they are sharpened, and otherwise will not cut chips properly. Sometimes instead of rubbing the hatchet on the stone, the reverse process of rubbing the stone on the hatchet is preferred.

Gouges, especially those ground on the inside, are more troublesome to sharpen than tools with straight cutting edges. An oilstone slip is required for the insides of gouges. When the gouge is ground on the outside the slip is used as in Fig. 9 to remove burr only. When it is ground on the inside the slip is used as in Fig. 10, and burr on the outside is removed by rubbing the back of the gouge on the oilstone. Sometimes the inside gouge is held in the hands for sharpening, like the outside gouge in Fig. 9, but with the

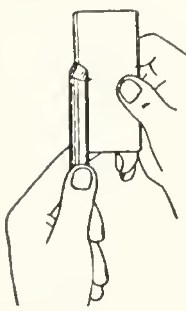


Figure 9

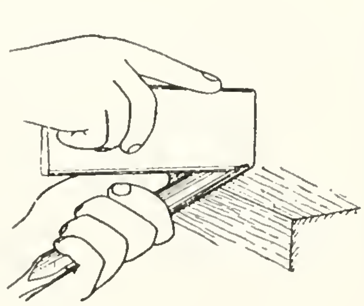


Figure 10

slip tilted to the angle. The method shown in Fig. 10, with the gouge bearing on the edge of a bench, is generally preferred, as there is less risk of cutting the fingers. Another way is to put the slip in a vise and rub the gouge on it. In grinding outside gouges a constant rolling movement of the gouge on the stone is necessary, and in sharpening on the oilstone there must be both rolling and reciprocal movement. This is quite easy with a little practice. An inside gouge is more troublesome to deal with. Gradually they are ground on one edge of the grindstone, and neat grinding is almost impossible unless the rounding of the edge happens to correspond with the curve of the gouge. Special stones are sometimes used, having a series of beads to fit gouges of different curvatures. Sometimes a revolving cone of emery or wood covered with emery is used for grinding inside gouges, those of quick curvature being done near the apex of the cone, while flatter ones find a surface to fit them nearer the base where the diameter is large.

Saws are sharpened with a file, as in Fig. 11, the saw being held in a vise. The file used is of triangular section as indicated by the dotted triangle in Fig. 12. This fits the teeth of ordinary saws of all sizes, and files

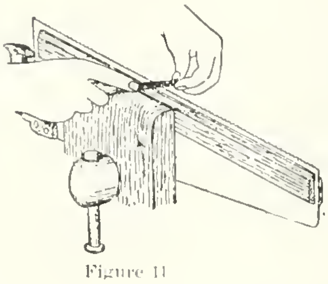


Figure 11

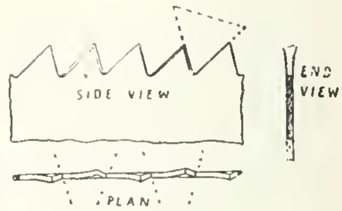


Figure 12

the front of one tooth and the back of the next one simultaneously. The correct rake for the teeth must be maintained, and also the correct slope for the file in plan, as shown by dotted lines. That shown is correct for ordinary purposes and soft wood. For hard wood the file is held more nearly at right angles in plan, giving practically square edges instead of rather acute ones to the teeth. For ripping with the grain the teeth are given more rake—that is, the triangle in the side view in Fig. 12 would be tilted more forward to undercut the fronts of the teeth. Rip-saws cannot be used for cross-cutting, but the teeth in Fig. 12, intended primarily for cross-cutting, can be used for ripping if necessary. Variations in size of saws and teeth make no difference in the shape and angles of the latter, those of a large hand-saw being of the same form as those of a fine dovetail saw. Saw-teeth occasionally require setting as well as filing, especially when intended for cutting soft wood. The amount of set is shown in plan and end view in Fig. 12. The teeth are bent alternately to each side, so that the blade will follow easily through the wood. For hard and dry wood little or no set is necessary. It is imparted by bending with a slotted saw-set or by punching with the saw laid on a block of wood, or by means of other setting appliances of various kinds. In sharpening the teeth it is best to file too little rather than too much if the operator is attempting it for the first time. When teeth have been spoilt by unskilful filing it is troublesome to get them correct and uniform again. When they are correct, but merely dull, the existing angles are a useful and reliable guide to the file and should be carefully followed.

Bits for boring are sharpened with suitable oilstone slips preceded by filing if very dull. In some cases filing alone is sufficient. A slip is used for spoke shaves and other tools which cannot be conveniently rubbed on the large oilstone. With the exception of saws, all cutting angles are about the same as the chisels shown in Fig. 1.

Civic Art and City Planning

Summary of Six Lectures in Toronto by Mr. Thomas H. Mawson

One of the live questions in Canada to-day is that of city planning, a new interest in which has been aroused by a course of six lectures delivered in Toronto a few days ago by Mr. Thomas H. Mawson, the leading landscape architect of England. The lectures were given under the auspices of the Toronto University, City Council, Civic Guild, Board of Trade, and Playgrounds Association. The meetings were well attended, and some idea of the comprehensive scope of the lectures may be gathered from the list of subjects treated: City Building—the ideal and first principles of city planning; the Civic Survey, and the preparation of data upon which to found a plan; Street Planning, with special reference to traffic problems incident to manufacturing, commercial and residential areas; Park Systems, including town gardens, playgrounds, public parks, reservations and boulevards; Equipment of streets, parks and gardens for utility and adornment; Housing hotel suburbs and villages, and the housing of the industrial classes.

The undernoted suggestions by Mr. Mawson are well worth noting by all who are interested in the proper development of the places in which they dwell, particularly by the members of councils and other public bodies in our smaller cities and towns, where great opportunities for good work along these lines exist:

Avoid haphazard building.

Estimate the course of the city's likely development.

Study the growth and origin of cities, coupled with reverence for the historical.

Study man and human nature, impression of the civic spirit, and the individuality resulting therefrom.

Do not cultivate the artistic at the cost of the comfort and wellbeing of the people.

Undertake civic improvement in a broad-minded spirit, and with the co-operation of the surveyor, architect, sanitary and hygienic engineer, town planner, medical health officer, sociologist, and practically every man in the city or town.

Seek advice from all available interested persons, and follow such as suit the planner's inclination.

Prepare a series of plans of park systems, street railway lines, fire stations, water mains, schools and workingmen's houses, to show the man in the street the essential connection between the practical and the aesthetic.

Provide for the automobiles, which have come to stay.

In planning a park system, interfere with nature as little as possible, and make art take a second place.

Aim at setting apart lands for the future, especially in the outskirts of the city.

Preserve existing natural beauties of park lands, rather than create artificial beauties.

Equip the streets, parks and gardens for utility and adornment.

Do not waste money in gaudy ornaments, which look old and dilapidated when the newness wears off.

Space houses far enough apart to be beneficial and artistic.

Avoid the monotony of rows of houses.

Apropos of this subject we give below a photograph of Ridpath Street, Lethbridge, Alberta, illustrating the success with which the ideals of city planning are followed in that city.

A Well Planned Street at Lethbridge, Alta.

Your Trade Journal Is Worth Reading Every Month

A Word to Busy Men by "Wanderer," who has Discussed this Subject with Thousands of Men in Various Parts of Canada

"The busy people make time." These words were uttered by a popular preacher during a sermon on "The Improvement of Time." "Only the idle people have no time," he exclaimed; then, dropping his voice to an earnest whisper, he added, "The busy people make time." This principle applies all round, but it applies specially to the man who claims that he has not time to read trade journals. Again and again the circulation man is told that his paper is admirable, but the party approached does not read the journals he already takes. Therefore he certainly cannot subscribe to more. Want of time is the excuse generally given. Surely that is a strange confession for an up-to-date man to make. Labor-saving devices increase in number almost daily, time-saving appliances are used on every hand, and yet a man who is in business for the avowed object of making money cannot find time to read publications that are designed to help him in the very work to which he devotes most of his energy. As a matter of fact many a man does not realize the value of the trade journal. He sees a pile of printed matter accumulating on his desk, and every time he notices it he is either annoyed or dismayed. This goes on until he finally swears vengeance on the next magazine canvasser that approaches him, vowing never to subscribe to another periodical—good, bad or indifferent.

Think for a moment what the trade journal really is. It is not for amusement or pastime, like the popular magazine inseparable from the news vender's counter or the hotel bookstall. It is a practical aid to a man in his vocation. Regularly read and properly used it means dollars and cents to him. For a nominal sum in cash and a small expenditure of time and effort it yields large returns, out of all proportion to the amount invested. Mr. Builder, this applies to you just as truly as it does to your neighbor the general storekeeper. Suppose that a man who was an expert in the building trade came to you and offered to visit you once a month to discuss current prices of materials, prevalent conditions, practical methods and new ideas. His scheme would appeal to you strongly, but you would remark at once, "That's splendid, but what are your fees?" Now the trade journal is equivalent to the visit of the expert, with two additional advantages: the cost is trifling, and the journal remains always at hand for reference.

A careful canvass of business men in several different trades has shown that the men who use trade journals derive real benefit from them. Many who take them and give little or no time to them frankly admit that they ought to peruse them regularly. As for the men who do not subscribe to them, they can advance no valid reason for refusing except the old, familiar one given above. Now there is not the slighest doubt that the mass of printed matter daily pouring into the store or office is amazing, and it is increasing all the time. Even in a small country town it is interesting to stand in the post office and watch the citizens opening their boxes, most of which seem to be well filled with newspapers, magazines and circulars. Let us concede that if a man resolved to wade through all the reading matter that came his way he would spend most of his time at it. All this is no argument against the steady use of the trade journal. Its aim is unique. It does not seek to teach a man his business: that is the sphere of the text book and the teacher we all hear so much about—Experience. But through its columns the ideas of practical men in different parts of the country are ventilated, an independent view of trade conditions is shown, unbiassed suggestions on vital problems are offered, expert guidance on technical matters is given, and up-to-date methods, schemes and ideas are discussed. If the journal contains market reports, by preserving them a man may keep at hand a concise record of fluctuations in price of the goods he handles or the materials he uses. This is the age of advertising, and as the advertisements in the trade journal are prepared by masters of the art of ad. writing the reader may glean valuable hints for his own advertising work from its pages. But we might go on indefinitely enumerating the advantages of the trade journal, and we remember that we are addresing ourselves to the busy man. The best thing for him to do under the circumstances is to give the trade journal a fair trial, if he has never done so before. The time required for reading is not so long as one is apt to think. One hour and a half is sufficient for perusal of the average trade monthly, and eighteen hours out of a whole working year is not a large slice. In any case where there's a will there's a way. "The busy people make time."

SPONTANEOUS COMBUSTION FROM OIL AND SAWDUST

It may be that many of the readers are already acquainted with the fact which I am about to state, writes a correspondent in Building Age, but I only discovered it by actual experience a short time ago, and think it may be of interest to others. It all happened through an accident, and in this way: A tin of boiled linseed oil was spilled in the paint shop Some redwood sawdust was brought in and spread over the oil to absorb it. This sawdust saturated with the oil was then thrown outside the door of the shop on to some waste lumber that happened to be lying there. The incident occurred at noontime during the summer when the sun was shining upon the lumber.

About an hour afterwards, one of the workmen, having occasion to go to that particular locality, saw smoke rising from the lumber pile. Investigation showed that a fire was smoldering. There was, however, no harm done, but the incident evidently set the boss to thinking, for he carefully gathered up the rest of the sawdust and took it out to the middle of the yard, where he spread it upon a flat stone. In half an hour the sawdust was blazing, and yet when it was placed on the stone there was not a spark in it.

The question naturally arose, Would the timber and sawdust have caught fire if the oil had not been there? Had it not been discovered in time most likely the shop would have been destroyed, thus adding another to the list of mysterious fires.

WINDOW AND DOOR FRAME WORK

By L. Villiers, in "Wood Craft"

It is time for something distinctively new and different in the line of window and door frame work. There are, in fact, two or more lines of development open for inventors and the geniuses of the trade in connection with this class of work. One that is getting attention these days is the designing of window frames and sash of a type that will permit of the sash being easily removed or turned inside out for cleaning. There is strong objection to the regulation manner of framing and hanging sash, because of the difficulties of cleaning the outside, and there have been numerous inventions with a view to getting windows so hung that both sides may be cleaned from the interior of a house.

Incidentally this has led to some attention, quite a lot more, in fact, than formerly, to the English casement windows and to hinged sash of one kind and another. It is probable, too, that these will be quite important factors in window work of the near future and also there will enter various new inventions, but so far there has been nothing brought out that promises to replace in wholesale the regulation window frame. Whether there will be or not depends on the ability of inventors to offer something that will give entire satisfaction in general use.

Another line of development in the making of window and door frames is in the tendency to make them in the knockdown, make them complete, so that the dealer can supply them to carpenters right along with the lumber and the windows. There are two objects aimed at in this plan, one is to manufacture given sizes and large quantities for the sake of cheapening the cost of production, and another object is to have work of this kind for planing mills to run on during the winter while building operations are rather slow, and have a stock of them on hand when the busy season comes so that orders for them can be taken care of promptly.

Adjustable Door Frames.

As a sort of side development of this idea there are adjustable door frames, or rather door frames with the jambs adjustable. The object of these is not only to facilitate fitting the door in the frame, but to have a door frame that can be adjusted from time to time as the door sags or the house settles so as to make the door hang and fit well. Everybody knows that with the average building, no matter how carefully the doors are hung, in the course of time they get a little out of true, either through the house settling or the door sagging slightly on its hinges. Then, the door will either sag at the bottom or bind the casing and a carpenter must be called in to refit it if it is attached to a stationary jamb. With an adjustable jamb it is claimed that the householder himself can adjust it in a few moments so that it will fit just as it should.

There is probably room for still further development in door frames with jambs adjustable to fit the door instead of always having to trim the door to fit into the jambs. Some day maybe we will reach the point where all doors are made and finished off to exact size and then instead of fitting the doors into the frames the frames and jambs will be made to fit the doors and a certain provision included for adjustment so that the hanging of a door will come to be a very simple matter instead of quite a tedious task of skilled work as it is to-day.

Another thing, and in certain respects the most important thing needing attention about window and door frames, is their use in brick and concrete walls. One of the great difficulties experienced with them is in their bending or bowing in. When brick walls are built up to the height of the bottom of the frames, the latter are all set in and the walls built around them and so on up to another row of frames and so on.

By the time a building is finished it is found that many of the frames have bowed in until the space is not as wide in the center as it is top and bottom. This is very annoying to the finisher and shows an imperfection of workmanship that we ought to devise means of preventing. Some account for it on the theory that the frames being against freshly laid brick absorb moisture on the side next to the brick, which causes swelling and expanding of the wood both in width and in length slightly, enough to make the sides tight and so that they will bow in. To prevent cupping or warping they are quite generally plowed in the back and it is probable that an improvement could be made by placing a sheet of tar paper between the window frame itself and the brick wall.

Careful study and analysis of the entire subject, however, brings the conclusion that the main difficulty with door and window frames in brick walls comes from the fact that the walls settle in drying out so that weight comes down on the top of the frame and causes the bowing in of the sides. If we but go back into the pioneer days we can find the same thing in connection with the building of log cabins and houses An opening would be cut in the log sides and an upright planking put each side of the opening for a door frame and pins or spikes driven to hold them in position, and the top log or cap resting on these upright planks served to help them in place and to complete the frame. In the course of time the logs would settle at the corners and thus weight would come down on the upright planks and in many instances they were kinked and doubled into veritable bows by the weight resulting from the logs settling down at their corners and thus lowering the top of the door opening. What it meant then was the cutting out of the old upright jamb and the putting in of a new one that was cut to fit in the reduced opening.

In the brick building we have the same settling in a modified way and to get the ideal of perfection in construction it means either the putting in of a temporary frame to stay until the wall is through settling, then remove it and put in a frame that fits the reduced opening, or it means devising a way to make frames that will adjust themselves to this settling, or in lieu of this in building the openings around window and door frames in brick walls so that there is room for settling without the weight coming on the frames. So, here we have two lines to work on, one that has to do with the woodworkers and the other that is a matter resting with architects and brick masons.

It would simplify the matter materially if the woodworkers interested in window and door frame building could design a thoroughly practical frame with some feature about it that will take care of the settling of walls. The writer does not feel able to give any specific hints or pointers on the subject. There might be many ingenious things gotten up that would do the contracting as the walls settled, but fail to have the permanency and other characteristics that are important in a frame. So, no suggestions will be offered, but the subject is commended for study and experiment, because there is need for some reform in the method of constructing and putting frames into brick walls. As brick walls get more common every year the subject continues to grow in importance.

HOW SIZE AND FORM AFFECT THE COST.

It may be that it is the carpenters' duty to build rather than to plan buildings, remarks John Upton in The Carpenter, yet often they are called on to figure on a building and make some suggestions which result in greater economy to the owner. One generally wishes to secure a given amount of space for as small an outlay as can be reasonably made. To do all this intelligently one must have some clear idea of how to secure economy in cost without sacrificing any good features.

A given amount of space may be inclosed with the least amount of wall when the inclosing wall is in the form of a circle, but generally it is not wise to construct buildings in this form, except silos, or those built of concrete.

Perhaps the octagonal building comes next. This form is more practicable than the circle for frame buildings; in fact, is quite often used for large and small buildings.

One might think it a difficult matter to frame such a building and it does call for careful measurement, but a study of almost any good book on the use of the square, a knowledge of practical work and the ordinary carpenter can prepare himself for this class of work.

When a building has four sides, the more nearly it approaches a square the less side wall is required to inclose a given amount of space. Where one of the dimensions are fixed as the usual width of a barn or hen house it results in economy to add to the other dimensions. Take some actual examples: The area of a circle is a little over three-fourths that of a square of the same diameter. A round barn 40 feet in diameter would measure 126 feet around it and have about 1,200 square feet of floor space. A square barn to have the same floor space would measure 140 feet around it. An octagonal barn, 16 feet on each side, or 128 feet around it, would have practically the same floor space.

Now, supposing the barn were made long and narrow. If 25 feet wide it would need to be 50 feet long and would measure 150 feet around it. On the other hand, if made 50 feet square it would have twice as much room and measure only 50 feet more around it than if it were long and narrow. There is also a saving in the amount of cornice by lessening the amount of side wall.

If a man intends to erect a building of a certain size, say 20 feet square, but for some reason decides to make it 30 feet square, the roof and floors are increased in amount as much as is the area inclosed, yet he has increased the amount of the inclosing wall by one-half only and has secured more than twice as much space as the smaller building would have contained. In fact, two and one-quarter times as much.

This is true in case our measurements are taken inside of the wall. If measured on the outside and the walls are 18 inches or 2 feet thick, there is still greater difference in the space actually obtained. There are some cases where it is not practicable to gain extra space in this way, since one must be guided by the available material and sometimes increasing the size of a building would require a heavier frame and so not really be economical.

One way to secure additional space at little cost is to make your building higher. This will apply in farm barns for storing hay.

As for the comparative cost of different styles of roofs, it takes about the same amount, provided they are the same pitch.

A hip roof is good since higher rafters can be used and less cornice has to be built.

The building permits issued this year in the city of Winnipeg show a total value of nearly $17,000,000 and Bradstreet's report says it is expected this figure will be considerably exceeded before the end of the year. The total permits for the whole of last year amounted to $15,116,450 and constituted a record period in the history of the city. Winnipeg thus holds third place amongst the cites of Canada in the matter of annual building returns. The chief features of the year in this respect has been the building of residences to accommodate the steadily growing increasing population which is reported to have increased during the past year by the addition of fourteen to eighteen thousand. Many new factories have also been erected. It is stated the city now has about three hundred factories representing a capitalization of about $40,000,000, and employing about 14,000 workers. The measures which the city has recently taken towards the supplying of cheap power is expected to greatly increase the number of manufacturing plants there.

CANADA'S LUMBER PRODUCTION—SOFTWOODS

Interesting statistical comparisons may be made from the 1910 lumber report prepared by the Dominion Forestry Department. Of the twenty-six species of wood which together were cut in 1910 to the extent of four billion, nine hundred million board feet worth over seventy-seven million dollars, the first nine were coniferous or softwoods. Spruce was the most important, alone forming over one-quarter of the total cut. Spruce and white pine together formed barely one-half of the 1910 cut, while in the year previous these two species made up nearly three-fifths of the total. This decrease in proportion is due not to a smaller cut of the two species, but to a very great increase in the amount of Douglas fir, hemlock, cedar and yellow pine produced in British Columbia. One-quarter of the 1909 cut was formed of these four species, while in 1910 the total cut of the four was increased by seventy per cent.

White pine lumber is undergoing a gradual evolution in its importance to the lumber industry. Up to three years ago, white pine stood at the top of the list when it was supplanted by spruce, although the actual cut of the former had not decreased. The prediction of last year that white pine had nearly reached its maximum cut has proven true this year, the 1909 cut being decreased by four per cent., or forty-two million feet. Yellow pine increased in its cut nearly six hundred per cent. in British Columbia during one year. This increase of over one hundred and fifty million feet was sufficient to raise it from fourteenth place in the species table to sixth place in importance, thus surpassing in one year, red pine, larch, balsam, and the four most important hardwoods.

BRICK WORK, CONCRETE WORK, AND MASONRY

Brick, Fireproofing, Tile and Terra Cotta, Cement Blocks, Reinforced Concrete, Cut and Crushed Stone, Concrete Mixers

HOW TO SET TILE FOR WOOD MANTELS

Practical Directions from "The American Carpenter and Builder" for Setting Tile, Placing Wood Mantel and Arranging a Successful Fireplace

One of the problems confronting the carpenter and builder in the small towns is how to set the tile which goes with every wood mantel, without calling for the expert services of the professional tile setter "from the city." Recently we have had a number of requests for practical directions for doing this work.

In order that builders in general may not be deterred, because of this difficulty, from using wood mantels, we present herewith some methods and rules for doing this work. These have been tested many times and have been found reliable. Any carpenter will readily see how this work is done; and so put himself in line for his share of the wood mantel business.

Fig. 3 shows clearly how the chimney and fireplace should be built to insure satisfaction. The chimney is seldom detailed by the architect and it is generally supposed that any good bricklayer can build a chimney correctly. This, however, is not the case; and the mantel manufacturer is, as a consequence, blamed "because his fireplace does not draw," whereas this is solely due to improper construction of the chimney and flue. For this reason we cannot urge too strongly the importance of having the flue built correctly. If the outlines shown in Fig. 3 are followed carefully the builder may rest assured that the grate will give perfect satisfaction.

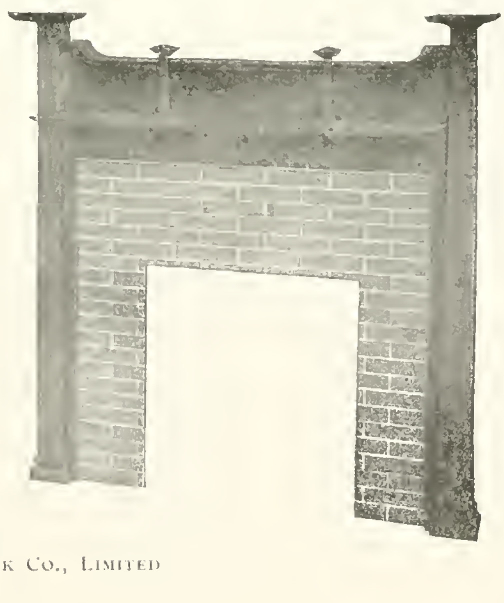
The foundation for hearths should be placed upon a brick arch if possible as shown in Figs. 1 and 3, to insure perfect fire protection. Above the brick arch is a layer of concrete, consisting of one part Portland cement, two parts clean sharp sand and two parts clean gravel, thoroughly mixed with sufficient water to form a hard solid mass when well beaten down into a bed, which should be from $2\frac{1}{2}$ to 3 inches thick and which should extend up to within about 1 inch of the finished floor level.

If the hearth is placed upon a sub-foundation of wood, as shown in Fig. 2, the concrete should be at least 6 inches thick and in this case may be composed as follows: one part Portland cement, one part clean sharp sand, one part clean gravel.

Before proceeding to the setting of the mantel and tile, see that the chimney is well built and sound, the arch properly turned for the hearth and the space above filled in with concrete as just mentioned.

Next lay out the hearth, getting the exact size of same. Cut out the floor to fit the hearth, but allow one-fourth of an inch for spreading.

Put all the tile to soak in clean water, letting them remain there an hour, and then lay them out to drip. Now mix up some good Portland cement mortar (one-



THE ELMIRA INTERIOR WOODWORK CO., LIMITED third cement and two-thirds clean sharp sand) and put this on the concrete, leveling same by using a straight-edge, with notches cut out one-fourth of an inch at each end. This straight-edge should be 3 inches longer than the hearth. Now commence at back of hearth and draw straight-edge forward or backward until cement is perfectly smooth and level. Lay in the tile, commencing at the front, taking care to follow whatever pattern is to be used. (Diagrams are furnished by the manufacturers giving the various patterns.) After the tile are all laid and fitted nicely to place, hammer them down lightly to level of floor with a small block of wood about 12 by 4 inches. When

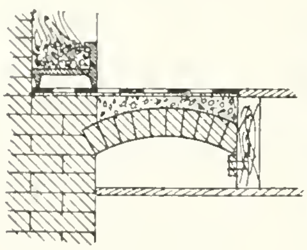


Fig. 1 With Brick Arch

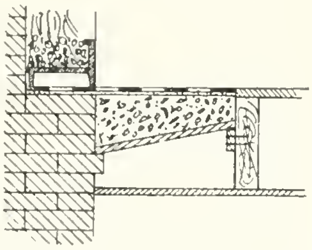


Fig. 2 Without Brick Arch; Section Showing Foundations of Brick Tiling

you have them all nicely in place, level and evenly spaced, mix up a little pure Portland cement, quite thin, and wash it over the surface, working it into the joints where needed. After this has partially set, wipe the tile perfectly clean with sawdust or a damp sponge. All of the cement should be cleaned off the face of the tile, as it is very difficult to remove after it is set. Let the cement set thoroughly before proceeding.

After the hearth tiling is in place and thoroughly bedded, it is next in order to set the mantel. To do this plugs are inserted in the wall at the proper places, and the mantel is screwed fast to them. There should then be $1\frac{1}{4}$ inches of space available for the tile facing and its cement mortar base, between the brick arch of the fireplace and the wood mantel.

For putting up the tile facing the cement mortar should be one-third Portland cement, one-third slack lime, one-third sand. Mix together thoroughly. Place this cement mortar or plaster on the front of the brick flue-arch (first dampening the bricks)

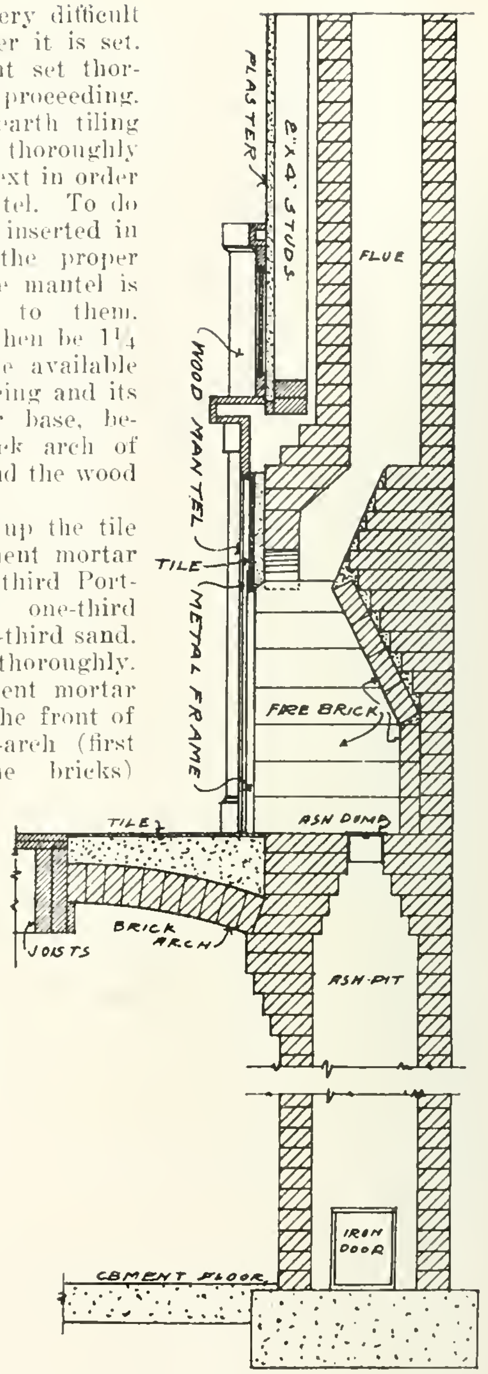
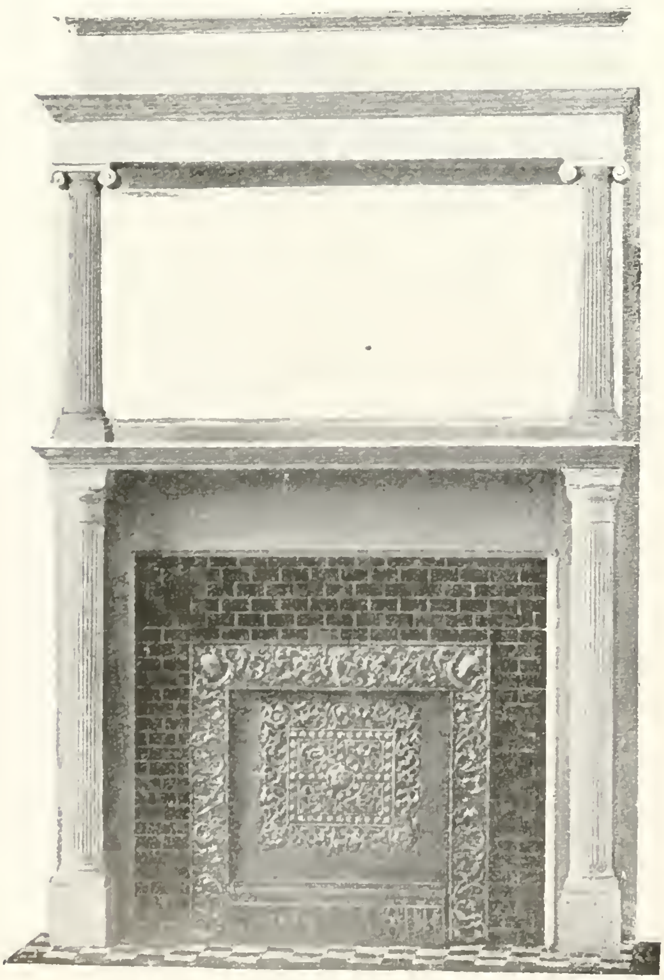


Figure 3

and with a straight-edge one inch longer than the mantel opening smooth the cement off by drawing the straight-edge upward until the surface is perfectly smooth. Now put up the tile facing, commencing at bottom and tamp each tile as you put it up. Having done this let facing set for a few hours.

It should be noted that these directions for setting hearth and tile facing apply to cases where tile has not been ordered mounted. If the hearth is ordered mounted it is only necessary to lay same down and mark around it and cut out the floor the proper size to receive it; and then see that it is evenly bedded in good cement or good rich mortar. If the facing is ordered mounted all that is necessary is to place same in proper position and then build in behind with the cement mortar.

[Note—We are indebted to Chas. F. Lorenzen & Co., of Chicago, for the data on which this article is based.—Ed.]



The W. A. Moore Co., Limited, Meaford, Ont.

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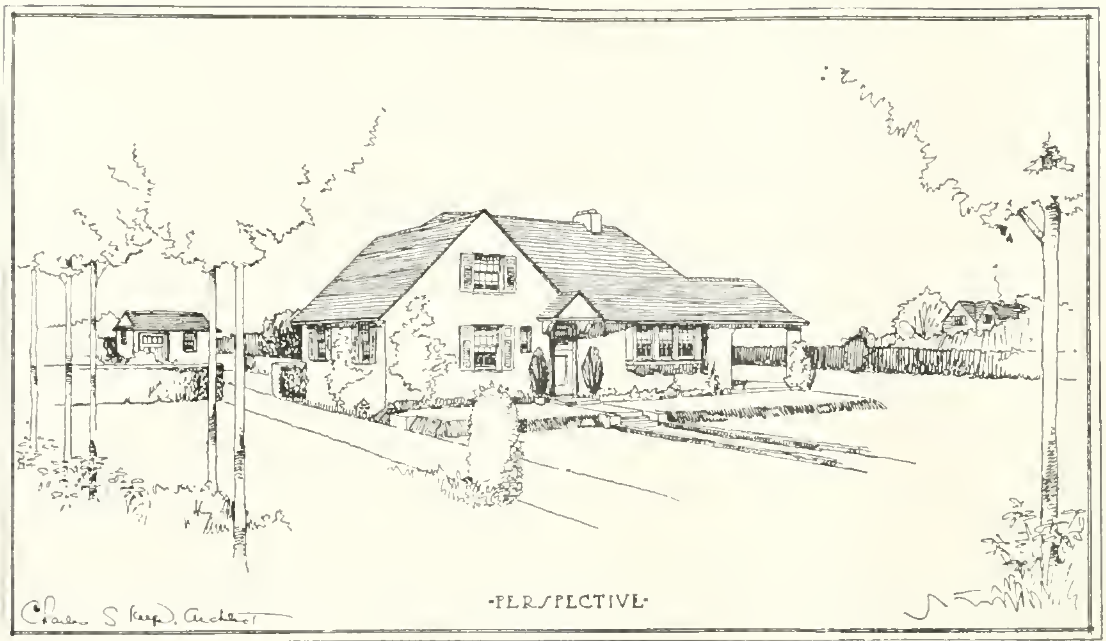
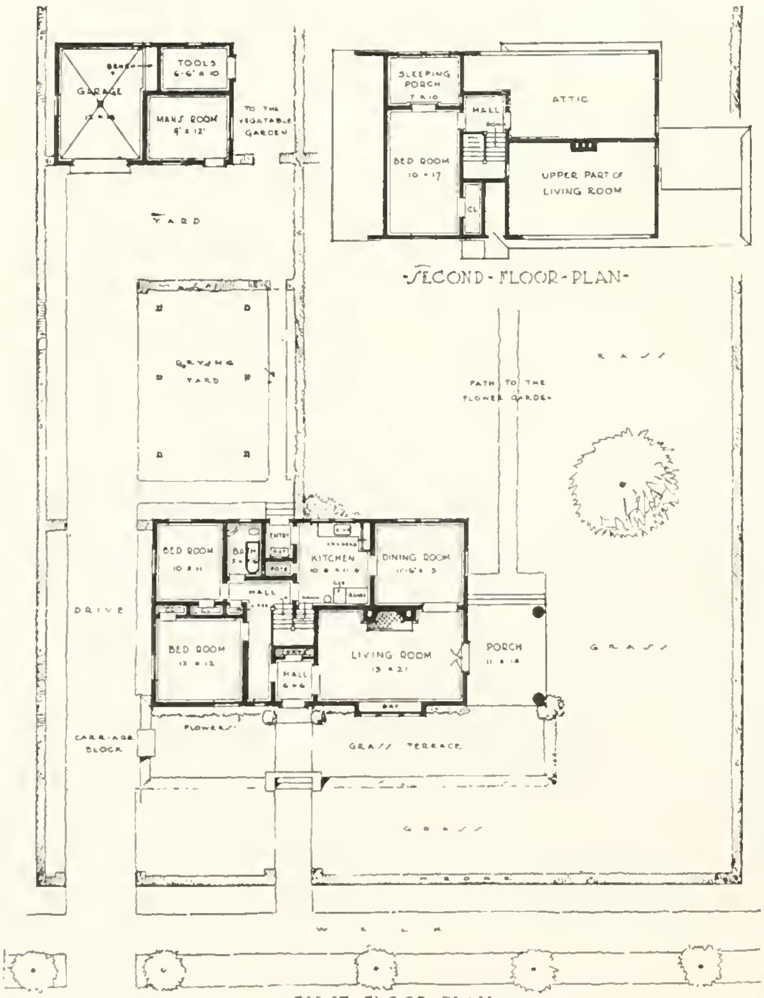




A CONCRETE BUNGALOW

Charles S. Keefe, a New York architect, has developed some interesting ideas in bungalow design, as the accompanying plans and perspective show. The first floor arrangement is very effective. The two bedrooms and bath are en suite. The one chimney serves both the fireplace in the living room and the kitchen range. The high ceiling living room, with a fireplace, and opening onto a side porch, should be very livable.

Upstairs, the one bedroom, sleeping porch and attic complete the house. A garage, providing sleeping quarters for one person, is also included. The modern ideas in design make for simplicity. Hallways are omitted where possible, and all space is utilized to the highest degree possible.

In the construction of this bungalow, concrete could be used to advantage as the straight and simple lines of the walls without ornament, make a good medium for concrete. All exterior work, such as porch floors, walks, garden fixtures, etc., would be in concrete. We are in a new age, where the most plastic, permanent and useful of building materials is helping us build beautiful homes.—Cement Age.

CHANGES IN VOLUME WHILE HARDENING.

In the August issue of "The Cement Age" a paper by A. T. Goldbeck discussed this question, and the following conclusions are of interest in summing up the problem:

1. Concrete upon hardening in air contracts.

2. When kept moistened during the setting process, concrete expands and if allowed to dry out after a small initial period of water curing, it will then contract.

3. The contraction of mixtures of wet consistency is delayed somewhat beyond those of dry consistency.

4. The amount of contraction of air-cured concrete is influenced very little by the proportions or consistency of the mixture.

5. For practical purposes the maximum contraction of air-cured concrete seems to be reached at the age of three months and equals approximately 0.05 per cent.

6. If moistened after drying out, concrete will expand.

7. It is probable that the shrinkage of concrete, under conditions which do not interfere with its rapid drying out, is far more potent a factor in the formation of cracks than contraction due to external temperature changes.

A METHOD OF REPAIRING CONCRETE AFFECTED BY FREEZING WEATHER.

Considerable trouble has been experienced in repairing concrete which has been exposed to freezing weather before acquiring final set, says "Engineering and Contracting." The following method has been used quite successfully:

Chip off with a pick and bull point the concrete which has been affected by frost, and then thoroughly wash the exposed surface with water, using a stiff scrubbing brush, until entirely clean. A 1:3 solution of muriatic acid is then applied with a brush, and the surface is again washed. As soon as possible after this is done a very wet mixture of new concrete is applied. Where the old surface has been thoroughly cleaned, and the new concrete kept damp for a week, it bonds nicely with the old surface, making it appear as solid as if the entire mass had been placed at the same time.

Concrete can be made the ideal building material. But it is not of itself ideal, nor proof against failure in the face of careless or designing slackness of work. Honest materials and honest workmanship are essential in attaining ideal concrete, as they are in attaining any other ideal. Since the world began, sound principles and sound application have always been necessary to satisfactory attainment.—Concrete.

ROOFING AND METAL WORKING

Asbestos, Cedar, Metal and Slate Roofings, Skylights, Cornices, Metal Walls and Ceilings, Expanded Metal, Ornamental Iron and Brass Work, Fireproof Doors and Windows, Galvanized Iron Work

CONCERNING FLAT TIN ROOFS

By H. M. Sanders in "Engineering Review"

While there are some 40 or more sizes of tin plate used in the sheet metal industry, ranging in size from 10 x 14 inches up to 44 x 120 inches, and in thickness from "IC" up to IXXX (triple cross) in thickness, it is our purpose at this time to speak of those sizes, thickness and quality of tin plate used specially for roofing purposes.

The sizes of tin plate in general commercial use today for this purpose are 10 x 14, 14 x 20 and 20 x 28 inches, ranging in thickness from IC (common) up to IXX (two cross).

Comparatively speaking, there is very little of the 10 x 14 size sheets used to-day. The 14 x 20 inch size is used in its place for the flat tin roof, where the tin is laid one sheet at a time in courses, each course breaking joints with the preceding course. Each sheet is cleated down to the roof with tin cleats 1¼ x 2 inches, usually from cleats attached to the sheets, as shown in Fig. 1 and Fig. 6. The cleats are locked into the under sheet and nailed to the roof boards, as shown.

While there are two kinds of tin plate called "bright plate" and "terne plate," the "terne plate" is used almost wholly for roofing purposes and for all places where it is subjected to weather exposure. In view of this, its coating or covering is largely of lead—two-thirds lead and one-third pure tin—and the best brands or qualities of the tin for this purpose show a smooth-mottled surface on both sides of the sheet.

In Fig. 1 we have shown a flat tin roof laid with 14 x 20 tin, showing how it is connected at the eave with a hanging gutter and how flashed around the chimney, and how and where each sheet is cleated when laid on the roof.

After the roof is laid and the seams hammered down it is then ready to be soldered, for which there will be required 6 pounds of solder for every 100 square feet. Resin should be employed for flux; no acid of any kind should be used. The roof boards should be covered with Neponsit roofing paper, on which the tin is laid. Before laying, the tin is painted on the under side with prime metallic paint mixed with boiled linseed oil, with a very little dryer in it. This painting should be done two or three days before laying the tin, so as to have it dry and hard when put in place on the roof and to prevent its rubbing off in handling.

There are tin roofs in Canada on some of the Government buildings that have been on for over 60 years, and the tin is still in good condition.

There are several instances of this kind of church spires and turrets which have stood even a longer test.

The writer recalls a building, an old mansion, which was remodeled in Western Massachusetts some years ago, where he was called upon to make changes in the metal work. The roof and gutters were tin. The old tin work taken out to meet the changes in construction was apparently just as bright and free from rust as when it was put on 40 years before, when the house was built.

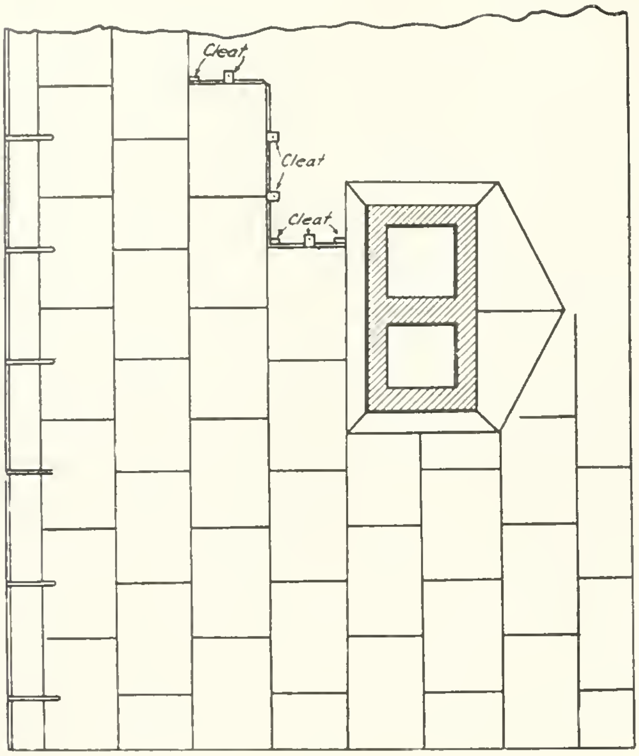


Figure 1

In the unfinished portion of the roof, as shown in Fig. 1, we have shown the relative position of the cleats on each sheet of tin as it is laid, and they are more cleary shown full size in Fig. 6. The small drawing, Fig. 3, shows the corners of the sheet clipped ready for turning locked edges as shown in Fig. 4, two of the turned edges showing on the top side of the sheet and the two opposite sides turned under. The size of these clipped four corners of the sheet is shown at

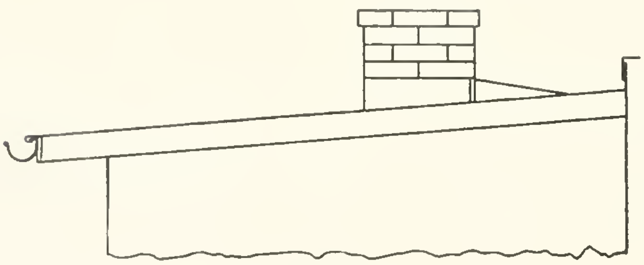


Figure 2

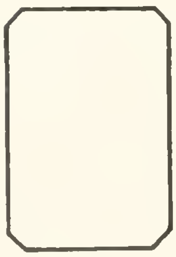


Figure 3

Figure 4

angle EFG in Fig. 5, and the dotted line HI the usual width of lock to be turned $^3/_8$ of an inch.

To expedite this class of work as much as possible it needs a bench rigged up as we have shown, Fig. 7, with the squaring shears A and folding machine b. At the left of the squaring shears A, at point a, place the tin to be notched, usually a box of tin at a time. Tin

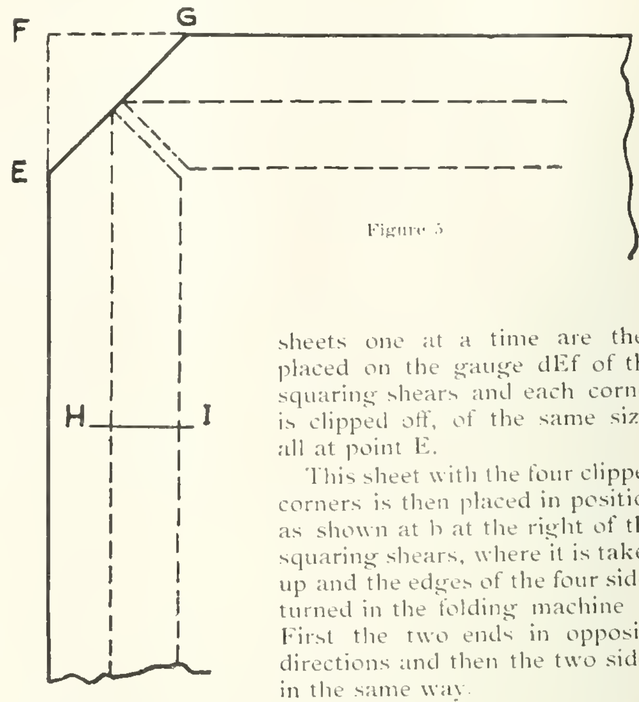


Figure 5

sheets one at a time are then placed on the gauge dEf of the squaring shears and each corner is clipped off, of the same size, all at point E.

This sheet with the four clipped corners is then placed in position as shown at b at the right of the squaring shears, where it is taken up and the edges of the four sides turned in the folding machine b. First the two ends in opposite directions and then the two sides in the same way.

This gives us the sheet folded ready for use as shown by C and also by Fig. 4.

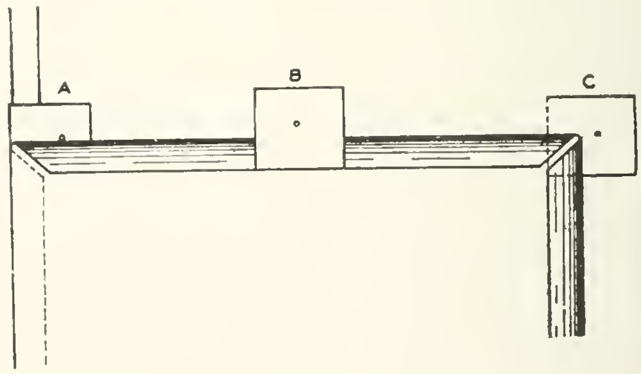


Figure 6

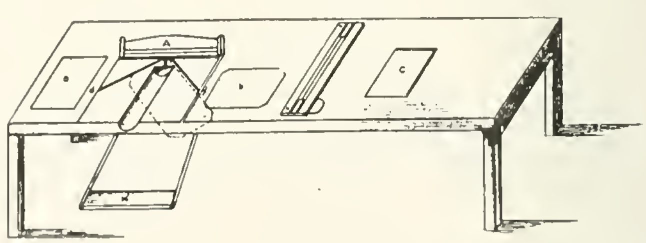


Figure 7

The National Builders' Supply Association is to hold its next Annual Convention in New York City in conjunction with the second annual Cement Show in Madison Square Garden, January 29 to February 3. It is felt that the meeting of this organization in connection with the New York exhibition will mean a very large attendance of building material interests from all parts of America.

HEATING, LIGHTING, AND PLUMBING

Boilers, Radiators, Furnaces, Lighting Fixtures, Bathroom Equipment, Hot Water Boilers, Kitchen Sinks, Laundry Tubs, etc.

HEATING AND VENTILATING HIGH SCHOOL BUILDINGS.

Address by Samuel R. Lewis before the American Society of Heating and Ventilating Engineers, at Chicago

The object of this paper is to outline the scheme of heating and ventilating a new school house building and the remodelling of the heating and ventilating apparatus in an established high school building, together with the scheme followed for supplying both buildings with steam for heating and with electric light and power from a central point. The new building is about 500 feet distant from the old building, which was formerly heated by ten warm-air furnaces. The ground space for the new building and its surroundings made it desirable to eliminate from it any boiler plant, and the fact that the furnaces in the old building were worn out at the time of the designing of the new building rendered it necessary to install new heating and ventilating apparatus there. The old building is of non-fireproof construction, hence it was proper to remove all fire from within it. The new building was to be completed in the spring of 1911. The old building must be provided with a new plant in the fall of 1909. These considerations prompted the location of the power-house adjacent to the old building, especially as coal storage space could be obtained under it, and it would be possible to provide enough capacity to handle the old building through the winter at minimum cost.

It was planned to provide the most efficient and economical type of apparatus known, with ventilation of all rooms up to at least 30 cubic feet of air per minute per pupil, with new sanitary apparatus, all of the ventilated type, and power for fan propulsion, lighting and manual training machinery in both buildings. Steam, return and electric conduits were permitted under the streets by special arrangement with the city.

It was decided to install the indirect type of heating, well governed by automatic regulation, as being the most positive and sanitary, as well as economical. Prominent advantages of this system are:

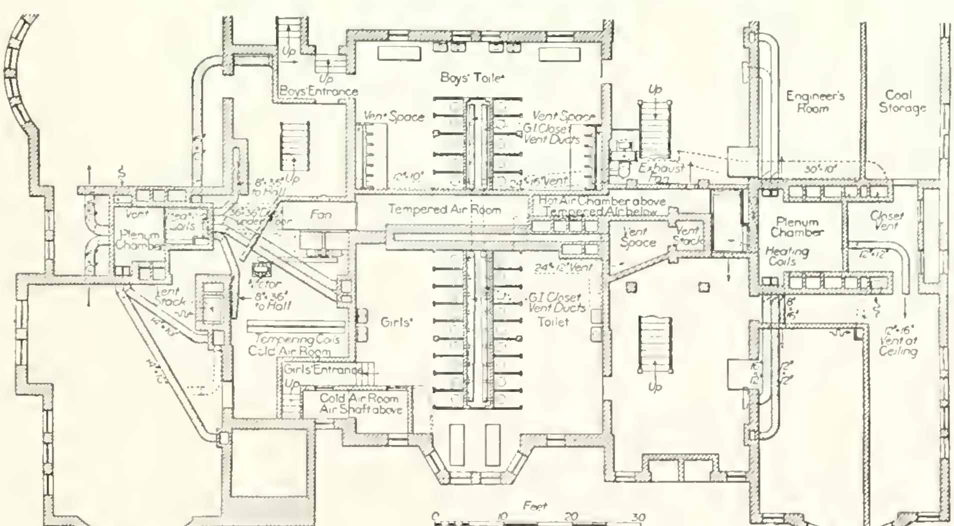
1. It is ordinarily difficult or impossible to hold school without running the fans and securing ventilation.
2. The pupils in a given room are all subjected to the same temperature and some are not overheated, as they must be when direct radiators are placed in the rooms.
3. The trouble and noise of air valves and steam and water circulation in the radiators are eliminated.
4. The false air circulation by direct radiators destroying diffusion of the fresh air is eliminated.
5. The author has always found the all-indirect plants to be more economical of fuel.

The following data may be of interest:

Chicago.—Five schools, with both indirect and direct heating, all of about the same size, averaged per cubic foot of space heated and ventilated per season 1.11 lb. of coal. Five other schools of approximately the same size, burning the same kind of coal in the same sort of boilers but having entirely indirect heating averaged per cubic foot of space heated and ventilated per season only 0.67 lb. of coal.

Kansas City.—The Manual Training High School having both indirect and direct heating cost in fuel, for the year 1909-10, per cubic foot of space heated and ventilated 0.273 cent. The Westport High School, having entirely direct heating, cost in fuel for the same year per cubic foot of space heated and ventilated 0.124 cent. Both buildings burn oil in similar boilers.

In the Decatur plant direct radiation is used in all toilets, offices, corridors or rooms with plumbing which might be injured by excessive cold. The advantage of having direct radiation in class rooms is that it tends



Remodeled Scheme of Heating and Ventilating in Old High School Building to keep them warm when the fans are not in operation, provided they are furnished with steam. At Decatur the buildings were arranged in such a manner that it was possible to group the indirect radiation in small chambers near the banks of flues, and thus by gravity air circulation keep the rooms reasonably warm without any direct radiation when the fans were not in operation. This has proved in practice to work out with remarkable success.

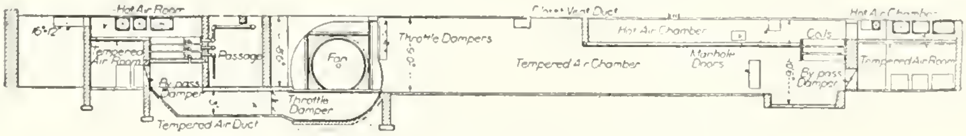
The boiler house is a fireproof building, containing three high-pressure horizontal tubular boilers of 450 rated horse-power, with standard equipment for bituminous coal. In a room adjoining the boilers are located the feed-water heater, boiler feed pumps, all main operating valves, pressure regulator, etc., and two horizontal turbine-generators, with the accompanying switchboards. The distribution lines for steam, compressed air and electricity centre in this room. The generators are for 250-volt direct current, and one is of 75 kilowatt, the other of 50 kilowatt capacity. Together they have ample power to carry all of the lights and power in both buildings at one time. In actual practice, however, the peak load never has overtaxed the smaller machine.

It is admitted that the turbines are not as economical of steam as would be reciprocating engines, but the fact that the plant is in service practically at no time when heat also is not required, and that therefore the electricity is practically a by-product, disposes of this argument. The turbines are practically noiseless, have a very long life, require no internal lubrication, thus relieving the boilers of oil, and they occupy very little space. The feed water heater is of only 150 horse-power, being used merely to purify the make-up water, or to supply one boiler when exausting to the atmosphere in warm weather, when the plant might be in operation for power or lighting.

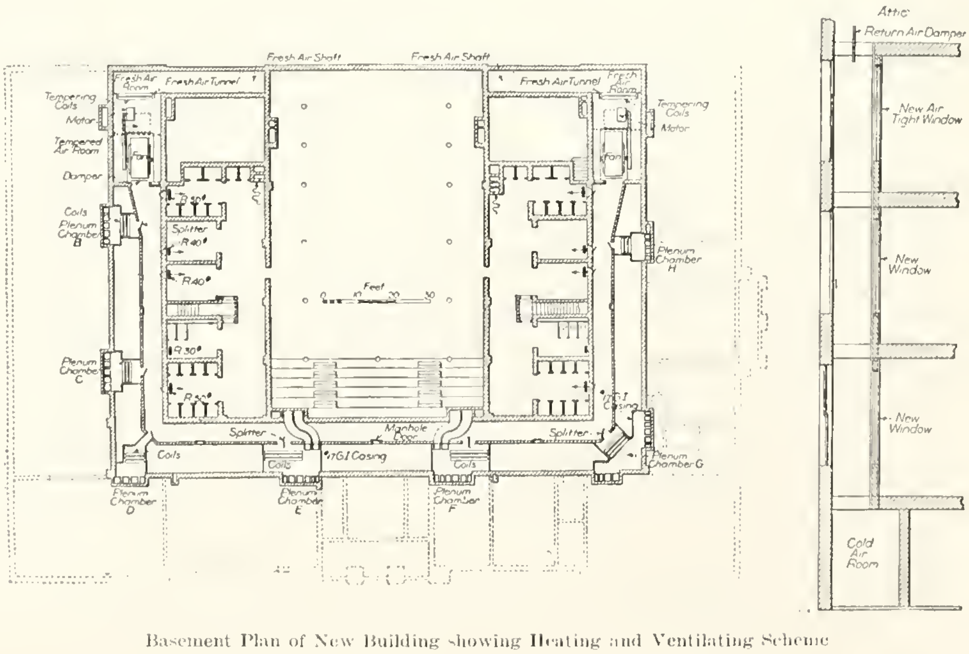
To the old building are run a 7-inch steam line and a $2\frac{1}{2}$-inch wet return. To the new building in a common trench, running about 650 feet and from 4 to 12 feet underground, are carried a 10-inch steam and a 4-inch wet return, in tin-lined Wyckoff insulation, and a four-part vitrified tile electric conduit, as shown. The main to the new building pitches upward from boiler house, and as it is below the receiver, the condensation in it is raised to the receiver by a tilting trap. Proper expansion joints and anchorages are inserted, the former accessible in brick manholes.

In the old high school the supply fan is a special Sirocco wheel driven by a belted 15-horse-power motor, delivering tempered air to horizontally placed reheating coils in plenum chambers directly at the bases of the flues. Fresh air is drawn from the second-story level. All toilet rooms have special closets, with large rear local vent openings, and all urinals are locally vented, being connected by metal ducts with an exhaust fan, which is driven by a direct connected $2\frac{1}{2}$-horse-power motor. New flues of tile supplement the old flues and in the attic are placed cut off dampers in all vent flues for shutting off the ventilation when the building is not occupied. This is effected by compressed air from the engine room.

All class rooms have automatic temperature regulation, the thermostats gradually moving mixing dampers in the plenum chambers without curtailing the volume of air, merely changing its temperature as required. Cumulative devices are installed, by means of which the power of the entire plant finally goes to the slowest room to reach 70 degrees when warming the building in the morning. On all side wall air supply open-

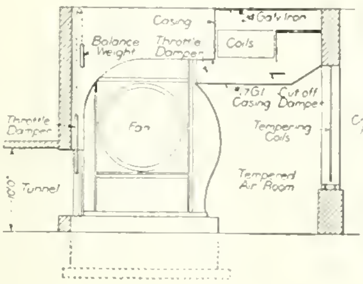


Sectional Elevation Through the Remodeled Plant in Old School

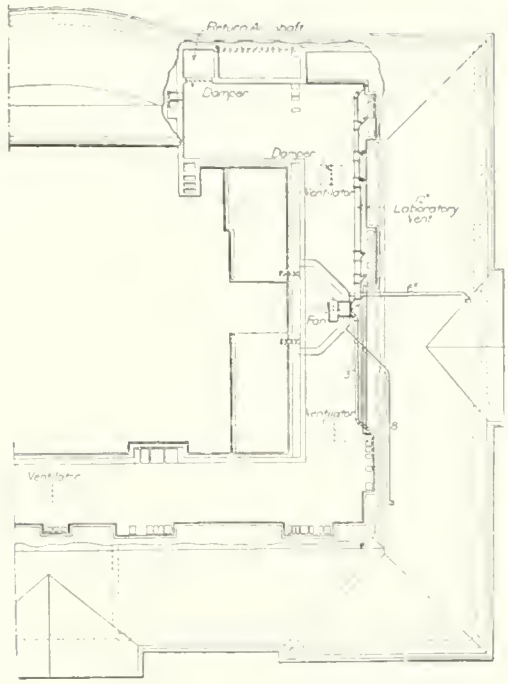


Basement Plan of New Building showing Heating and Ventilating Scheme ings are placed adjustable diffusers, by which the air currents may be deflected to any part of each room. There are no vent screens or registers in the new building, the ventilation outlets being finished as far as visible like the rooms, and thus they are swept out every day, preventing the unsightly accumulation of dust, chalk and paper common when screens are used.

The old high school building has an air delivery of 43,000 cubic feet of air per minute, and about 3,600 square feet of indirect radiation. The air blown into the corridors finds its way out through the toilet rooms, through the locally vented fixtures, and thus there is always a greater air pressure in the former than in the latter, effectually preventing odors from the toilets anywhere in the building. The toilet ventilation is entirely separate from the room ventilation.



Details of New Building Plant

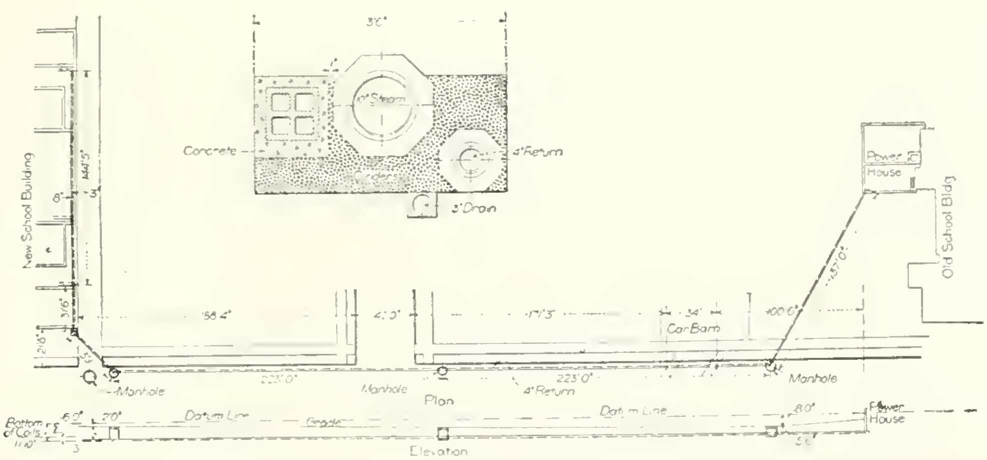


Exhaust and Return Circulation in New Building

The new high school was naturally an easier and more symmetrical problem, but the description of the apparatus in the old building will very nearly suffice for the new one. The fresh air is drawn from the second floor level, tempered and delivered by the fans into a tunnel which extends under the centre of the corridor, around three sides of the building. In this tunnel are nine groups of reheating coils and all of the piping for steam and condensation. The tunnel is of ample size for easy inspection, and can be flushed out with a hose. It is well lighted with electricity. It will be noticed that there is very little use of metal duct work. By closing the doors to the various other coils the auditorium or gymnasium may be ventilated or heated by either fan, without affecting the balance of the building. The supply fans are Sirocco wheels in double discharge housings propelled by 20 horse-power belted motors. The building receives 120,000 cubic feet of air per minute, and there are about 9,000 square feet of indirect radiation.

Exhaust fans for toilet and chemical table ventilation are placed in the attic. Together they have a capacity of 15,000 cubic feet of air per minute and have 8 horse-power in motors. The chemical laboratory ventilation is carried in vitrified tile pipes, and the fan which handles the fumes is of special corrosion resisting construction. A large, tight foul-air chamber is formed in the roof space, from which the foul air escapes through ventilators, equipped with compressed-air controlled dampers as described for the old building. In both the old and new buildings the foul-air chambers in the attic may be thrown in connection with the fresh-air intake flues, thus forming a closed circuit, through which the air may be recirculated over and over positively, and a substantial fuel saving is thus effected when warming the building prior to occupancy.

Each room has in its supply flue a volume damper, operated from the back of the diffuser in the room.



Conduit for Supplying Heat and Electricity to New High School Building but located in the inlet to the flue in the basement. This arrangement is of great convenience when adjusting or testing the air distribution, besides eliminating any unauthorized manipulation of the dampers, as is common with the ordinary type.

The locker and shower rooms in the sub-basement of the new building and all the corridors have both direct radiation and air supply from the indirect system. Whenever possible the air is delivered through or against the direct radiation, thus increasing its efficiency about three times and preventing local circulation.

PAINTING and DECORATING PLASTERING

Paints, Stains, and Varnishes, Shingle Stains, Waterproofing, Wall Finishes, White Lead, Window Glass, Putty, Oils, Metal Laths and Plaster

THE PAINTING OF TIN ROOFS

By A. Ashmun Ketly, in "The National Builder"

Much has been said concerning tin roofing, defects of manufacture have been pointed out, and the causes of tin roof deterioration, particularly as regards the painting thereof, have been discussed until there would seem to be nothing more to discuss. Yet it is evident that there has not been a right understanding of the matter, nor a correct knowledge of the true cause of tin roof failure, even though experts have told us all about it. First, then, let us ascertain why tin roofing does not wear as it formerly did. This point I believe is well settled, in the fact of the newer method of sheet iron manufacture, whereby the produce inclines to rust, no matter what paint may be used upon it. It is well known that sheet tin will rust under the best paint, and in the absence of all the usual agencies for iron deterioration, such as vapor, or dampness, and so on, under the tin roofing, and while the surface tin has been well painted. That rusting will go on, in spite of anything we can do. Some tin will stand up longer than certain other tin, this due to quality, which is governed by price.

It being settled, then, that tin roofing will rust in defiance of any paint or care, let us see what can be done to make the surface resistant to the weather, etc., as long as possible. Taking a new roof we find it damaged by scratches from the shoes of workmen, and here the rust will start first. The paint then should be applied as soon as possible, before rust starts. Many say that a new tin roof should stand until it rusts lightly, which will give the paint tooth or holding surface. This is a grave error, as the rust will continue under the paint.

The working specifications adopted by the National Association of Master Sheet Metal Workers call for the cleaning off of the surface and immediate painting. The under side is to have a coat of paint, kind not stated, before laying. The paint for the upper side is to be of pure metallic oxide of iron, or Venetian red, mixed with pure raw linseed oil. No driers or turpentine to be used in this paint. The paint is to be applied by hand, with an ordinary paint brush, and the paint is to be well rubbed in. Two weeks after the first coat give a second coat. A year later apply a third coat. Some advise two coats of paint on the under side and no doubt the extra cost would be amply repaid in the longer wearing of the tin roof. Tin roofers, as a general thing, paint the under side with a thin mixture of asphaltum and benzine, and they might as well use whitewash, for all the good the cheap benzine mixture does.

Asphaltum is injurious to tin roofing, and it is advised never to use any paint on a tin roof that contains tar, pitch, or bituminous compounds. This point has been tested by the Association of Sheet Metal Workers.

In mixing roofing paint it is better to use raw linseed oil than the boiled oil, excepting in the case of graphite paint, when boiled oil will be found better suited.

Regarding painting an old tin roof, first let the tinner repair any possible damages. In case this is not done, or cannot conveniently be done, then scrape and clean the tin, and where a leak is found or suspected take a strip of linen toweling and dip it in the paint, and lay it smoothly on the broken part. Then paint the roof with a good paint, iron oxide or graphite, as desired. Linen material is advised in this method, for the reason that cotton will rot from the action of the oil, while linen will not.

If a tin roof can last from 30 to 40 years, as it did in times past, it might safely go without paint for a long time. Many an old tin roof has gone without painting for intervals of six to eight years. It has been said by some one that the interval between painting an old tin roof is about equal to the average life of a tar-and-gravel roof, but such endurance cannot be looked for from ordinary modern tin. Good, handmade tin has stood exposure on roofs for years without paint, and without showing any rust. As a matter of fact, tin itself cannot rust. Still, it is best to paint a tin roof.

The proper paint for tin roofs, old and new, is that made from metallic brown, or oxide of iron, Venetian red, or silica-graphite paint. Each has its champion, and all are good. Paint the roof as soon as possible after it has been laid. Give it two coats, with a week between, and after the lapse of two or three years, depending upon local conditions, apply another coat, always using one kind of paint.

A writer says he knows of nothing better than red lead ground in a raw, cold-pressed linseed oil, applied the day it is mixed, which is a wise precaution, for red lead settles in the pot quickly, and should be used dry, and be mixed just before beginning the job; if ground in oil, as the writer describes it, it would be hard and difficult to mix. For this reason red lead is very seldom bought ready ground or mixed. He states that after painting a roof with the red lead he applied iron oxide paint, being persuaded to do so, he adds, with the result that the brown paint peeled, and even the red lead paint came off in places. Doubtless the brown paint failed to hold on the hard surface of the red lead paint. I would not advise the red lead priming coat. There can be no advantage gained over the use of a simple iron paint.

As to silica-graphite paint, a master painter tells me that he did a tin roof with it, and that it did not require repainting in 18 years. Another painter calls attention to a roof that he painted with the graphite paint, and after 12 years it looked good and apparently would not need repainting for several years more. This paint has been known for many years as a roof paint, it having a strong affinity for iron and adhering well to tin. Being a carbon, it would naturally protect the tin from rust, whether from water or from air. It may cost a little more, but as it covers more surface than mineral brown paint, pound for pound, to the extent of 58 square feet, and wears probably five times as long, its economy is apparent. It sheds water like a duck's back, and is not affected by heat, cold, alkalies, or any known chemical solvent; it fuses only at a blow-pipe heat.

But there are many testimonials also in favor of the oxide of iron paints, such as the well-known brown and Venetian red. Tin roofs are known to have stood as many as eight years without repainting, after being done with brown paint. But it must be remembered that a roof may seem to be in good shape as regards the painting, and yet not be. Here is where some make a mistake, and rush into print with it. The roof ought to be carefully examined, in various part of the surface, and its true condition noted. I make these remarks in view of the conflicting testimonies of painters upon this subject.

Some of the oldest and most expert painters prefer Venetian red paint for tin roofs. There are at least two kinds, one a pure iron oxide, and the other having a base of gypsum, which is made red with a pure iron oxide of a bright color. The English Venetian red is generally supposed to be the best of the class. Red lead may answer, but it is costlier than the browns and harder to mix and apply. In the thinning of red lead paint some advise linseed oil and turpentine in equal parts, while others use two-thirds turpentine. This is claimed to form a hard and durable cement.

Never place tarred paper under tin roofing. It will surely corrode the tin. Sheathing paper is all right.

Whatever kind of paint you may use, see to it that the tin is perfectly dry before painting, and if the work can be done in the early fall, in dry weather, it will need no driers in the paint, and the work will last much longer than when done in warm or hot weather. The best work can be done with a round paint brush, not with a wide brush fixed to a pole. Get down to it, rub the paint in and brush it out evenly. Avoid runs along the seams, as a run or excess of oil in any place will eventually cause the paint to peel off. Be sure that every part is perfectly coated.

An inexpensive paint may be made for old gutters, etc., by the following method: Place all the old paint skins, the cleanings from paint pots, bits of dry putty, and any old paint on hand, into an iron kettle with some raw linseed oil, and boil the mass until all is dissolved. Then strain, and add fine dry sand until the mixture is about like average paint consistency, so that it will spread well under the brush. It is best applied hot, or at least warm, and a quite heavy coat should be given. It can be used around flashings, chimneys, etc. When dry it has a hard, enamel-like surface, and it may be colored to suit any surrounding color. If it has been properly prepared it will be as smooth as glass.

A NEW CONCRETE BUILDING PROCESS.

Mr. A. D. Dame has accepted the position of sales manager for Canada of "The Master Builders' Method," a process of making concrete floors absolutely wear-proof, even against heavy trucking. They are consequently dust proof, and also waterproof on account of the density of the concrete. In brief this process is the addition of a patented filler to the top finish which renders the concrete extremely dense and hard. This filler is a metallic substance which is made by grinding very fine a special grade of pure iron and incorporating with it certain chemicals which cause it to oxidize and expand when mixed with the wet concrete, thereby entirely filling the voids in the concrete. This enables old floors to be patched, as this filler makes possible the bonding of new concrete to old. The filler being put in wet, capillary attraction draws it into the pores of the old concrete where it expands and forms the bond.

Mr. A. D. Dame

Mr. Dame has won a very wide connection and influence in the building trades supply business for over fifteen years, having held important positions with The Metal Shingle and Siding Co., Preston.; The Galt Art Metal Co., Galt, and Steel and Radiation, Toronto, and "The Master Builders' Material" will be well represented in Canada.

CEMENT BUNGALOWS.

Architects and home-builders have discovered, of late, that cement can be adapted to the construction of the bungalow with distinct success, says Suburban Life. Following this discovery, many bungalows of this kind are being erected in various parts of the country, and when skill and good taste are exercised in designing them, they present a very home-like and attractive appearance. Indeed, the indications are that cement will be one of the most common materials used in the construction of bungalows during the years to come; for the bungalow, as a type, has become firmly intrenched in the esteem of the people who desire simple and unpretentious homes, while cement has been established as one of the most valuable building materials known.

CANADIAN NATIONAL ASSOCIATION OF BUILDERS' EXCHANGES.

City.	Secretary and Address.
Montreal	J. H. Lauer, Sec., 263 St. James Street.
Toronto	P. L. Fraser, Sec., 2 Berti Street.
Quebec	A. Cote, Sec., 23 Rue St. Jean.
Ottawa	W. Hastings, Sec., 22 Metcalf Street.
London	Geo. S. Gould, Sec., Bank of Nova Scotia Building.
St. Thomas	E. O. Penwarden, Sec., Dowler Block.
Kingston	E. R. Beckwith, C.E., 292 Earl Street.
Guelph	Mahoney Brothers.
Sault Ste. Marie	MacPhail & Wright Cons. Co., Ltd., P.O. Box 835.
Brantford	A. J. Cromar, Sec., 103½ Dalhousie St., P.O. Box 212.
Windsor	J. L. Young, Sec., 44 Campbell Avenue.
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St. John, N.B.	H. L. McGowan, 137 Princess Street.
Halifax, N.S.	H. Roper, care S. M. Brookfield, Ltd., 58 Granville Street.
Winnipeg, Man.	J. H. Buxton, Jr., Sec., Portage Avenue and Hargrave Street.
Regina, Sask.	H. R. Abbott, Sec., Builders' Exchange.
Calgary, Alta.	A. Chamberlin, Sec., Board of Trade Building.
Edmonton, Alta.	A. O. Wetmore, Sec., McDougall Court.
Medicine Hat, Alta.	J. D. Everard, Sec., Builders' Exchange.
Lethbridge, Alta.	E. Power, Sec., Acadia Block.
Vancouver, B.C.	Builders' Exchange, 342 Pender Street.
Victoria, B.C.	Chancery Chambers.

COST OF GRANOLITHIC FINISH OF CONCRETE FLOORS.

The following figures of cost for the finished surface of granolithic concrete floors are average results obtained by a Boston construction company during their long experience in laying this class of floor.

For a 1-inch finished floor surface laid integral with and at the same time as the structural concrete, finishers being paid 50c and laborers 20c per hour, costs figured for 100 square feet of finished surface:

Finishers' time	$1.00	to $1.30
Mixing and placing concrete		.42
Cement, 1 11-100 barrels	1.40	1.55½
Sand, 3½ feet at $1		.12
Fine stone, 3½ at $2		.25
	$3.19	to $3.64½

If laid after the structural concrete has set and not integral with it, the total cost of the floor will be about $1.50 more per 100 square feet. If finished surface is reinforced with ¼-inch steel bars 12 inches on centres to prevent cracking, add extra labor for mixing and placing concrete 40c, and extra labor finishing 30c, or 70c per 100 square feet, and for placing steel, 50c per 100 pounds, with cost of steel about $3 per 100 feet laid down.

Be on good terms with your fellow-workman. In many ways it pays to be friendly.

STUDY THE METHODS OF SUCCESSFUL MEN.

Experience is our greatest teacher. Theory may be all right or only partially right, or it may not be properly applied and produce failure.

There are but few experiences in life that have not been gone through by others, and we can gain vast stores of knowledge by studying their plans and methods, and noting the results; thus we can apply that which is good and discard that which is not good or wholly bad. If we attempt to work out our own problem for ourselves, we will find it not only a needless waste of time and energy, but of our means as well. If you are a young man just starting in business, study the methods adopted and used by men who have succeeded in business, but do not follow a plan just because someone else does it that way; see if you cannot find a better one; if not, then adopt the best you know. No man has a corner on best methods but may use some methods not of the best because better plans have not developed. Experience may be gained in many ways; much can be learned of the success and non-success of others from coming in contact with men engaged in the same line of business, whether it be from meeting in an associational gathering or a casual meeting on the street; much can be gained from books and trade papers. The main thing is to be ever on the lookout for suggestions that can be used to advantage and then applying them in your own business.

Caution tempered with good judgment is wise, but he that is over-cautious lacketh wisdom and will surely fail. Hope is a vigorous principle; it sets the head and heart to work and animates a man to do his utmost.—Plumbers' Trade Journal.

BUILDING DEVELOPMENT IN CANADA.

The optimism and enterprise of the people of Canada, the expansion of her commerce, and the increase—present and prospective—of her population, is remarkably demonstrated by the statistics of building operations for the month of September, compared with those of September, 1910.

Of the four leading cities, Winnipeg again heads the list with a gain of 212 per cent. Three of the smaller cities show an amazing advance, viz.: Guelph, Ont.; Medicine Hat, Alta., and Nelson, B.C. The following table, from "Construction," will enable our readers to go into the figures for themselves:

	Permits for Sept., 1911.	Permits for Sept., 1910.	Increase Per Cent.	Dec'se Per Cent.
Brandon, Man.	$ 150,200	$ 438,675	.....	65.76
Brantford, Ont.	84,900	87,775	.....	3.28
Calgary, Alta.	903,210	720,372	25.38	....
Edmonton, Alta.	369,970	169,863	117.80	....
Fort William, Ont.	147,500	170,340	.....	13.41
Guelph, Ont.	102,300	5,100	1905.88	....
Halifax, N.S.	20,405	148,119	.....	86.23
Hamilton, Ont.	771,200	266,475	189.40	....
Kingston, Ont.	13,425	17,576	.....	23.62
Lethbridge, Alta.	93,200	72,180	29.12	....
London, Ont.	114,463	148,950	.....	23.16
Medicine Hat, Alta.	174,600	16,500	958.18	....
Montreal, Que.	1,157,876	993,386	16.56	....
Moose Jaw, Sask.	192,400	35,600	440.44	....
Nelson, B.C.	20,620	2,425	750.30	....
Ottawa, Ont.	277,275	160,950	72.21	....
Peterboro, Ont.	88,954	21,865	306.83	....
Prince Albert, S'k.	147,600	188,150	.....	21.55
Port Arthur, Ont.	75,400	42,450	77.62	....
Regina, Sask.	425,700	209,750	102.95	....
Saskatoon, Sask.	330,950	183,550	80.30	....
Stratford, Ont.	15,000	18,000	.....	16.67
St. John, N.B.	25,000	17,200	45.34	....
St. Thomas, Ont.	35,750	25,650	39.37	....
Sydney, N.S.	18,650	25,110	.....	25.73
Toronto, Ont.	1,904,810	1,332,535	42.95	....
Vancouver, B.C.	1,736,568	740,715	134.44	....
N. Vancouver, B.C.	78,344	....	.....	....
Victoria, B.C.	406,295	199,686	103.43	....
Windsor, Ont.	49,425	38,300	29.05	....
Winnipeg, Man.	2,547,000	814,350	212.76	....
	$12,478,990	$7,311,597	69.60	....

REDWOOD IN HOUSE CONSTRUCTION.

Redwood has long had the reputation of being one of the slowest woods to burn and for that reason one of the safest materials for wooden houses, says Bulletin 95 recently issued by the Forest Service: It does not kindle in a blaze quickly, and so absorbent is the wood that it takes in water almost immediately, so that a redwood house on fire may be saved when a pine building in the same situation could not be. It is not denied that redwood houses will burn, but it is asserted that they are less liable to burn than buildings of most other woods.

Many California towns were built largely of redwood. San Francisco, as it existed before the fire, was said to be three-fourths shingled and sided with it. In many of the towns and villages near the redwood belt its lumber exceeds any other in quantity used, and perhaps in some instances it exceeds all others combined. One of the largest demands upon it is for shingles, in some years exceeding 700,000,000. Vessels sailing around the Horn carried them to Boston and New York at a time when white pine was plentiful in the East and was in direct competition with redwood as shingles. A Boston building with a redwood roof was still well protected against the weather after 31 years of use.

In 1907, of all the shingles reported by species, those of redwood averaged the lowest in price at the point of manufacture, being a fraction over \$2 a thousand. It has been claimed for redwood shingles, as for railroad ties, that they wear out before they rot. In some cases this appears to be true. The roof on the old quarters of Gen. Grant at Fort Humboldt, Eureka, Cal., has been cited as an instance. When first occupied by Gen. Grant in 1853 the roof was doing service, and the shingles remained sound more than 40 years afterwards, and would probably have held their place much longer had not the nails that held them rusted off. Many were sent to the World's Fair at Chicago for exhibition. Decay had not marred them, but the weather, assisted by wind-driven sand from the seashore, had worn some of them very thin where directly exposed. Redwood door and window frames in the old fort buildings were remarkably well preserved after nearly half a century of exposure to weather.

A large part of the nearly half billion feet of redwood lumber sawed annually is for house construction, and four-fifths of it finds buyers in California. More than 30,000,000 feet was used in this country outside of California in 1907. The lumber enters into practically every part of the house. Siding takes a large part, and porch columns, cornice, sills, rafters, joists, and studding are in almost universal use within convenient distance of redwood mills, but many persons consider the softness of the wood an objection to its use for floors.—The Building Age.

AN ILLUSTRATION OF THE LOSS FROM FOREST FIRES.

That the conservation of timber lands and the prevention of forest fires are "burning questions" in more than one sense is evident from Bulletin No. 44, issued by the Forestry Department.—6 pt sub-head.

An interview with an engineer given recently in a western paper to the effect that there is abundant timber on the line of the Hudson Bay Railway is an illustration of the misapprehension in regard to this matter that exists in the public mind. Because there are large areas of land in the north on which there is timber of some kind, the conclusion is reached that it is all of present value and that the country has an unlimited supply. As a matter of fact a careful inspection of the timber along the line of the Hudson Bay Railway made in the years 1910 and 1911, by the Forestry Branch of the Department of the Interior, shows that there is not enough mature timber along the line of that railway to build the road. There are no prairie districts of any extent along the route, there are trees everywhere, but owing to repeated fires the forest is, except on the merest fraction of the area, too small for commercial purposes and unless it can be protected from fire until it reaches maturity, will never be of any use to the country. Explorations in other parts of the northern forested districts tell the same tale. Everywhere fire has worked havoc, and the forest is a mere wreck of what it might have been if fires could be prevented. And unless adequate measures are taken now to protect the young and immature forests which form the major part of the stand, the outlook for the future is none too good.

If the northern forests are to continue to be a permanent source of wealth to the country, it is absolutely necessary that the fire ranging system should be extended and that proper methods of management of the forest should be applied, and public education to the value of the forest is even more necessary.

Sweden, which has large extents of northern forest, practically uninhabited, similar to those in northern Canada, has about eliminated the fire danger in such districts mainly by educating her people to the value of the forests.

REMOVING PAINT FROM BRICK OR STONE WALLS.

A contractor being called upon to remove some old oil paint from a wall constructed for the most part of brick, but with more or less stone facing and both painted, raised the question as how best to do the work. It appears that in some places the paint had peeled or flaked, while in other spots it was stubborn and would not yield to scraping or wire brushing. He did not dare use the torch, neither did he wish to pay the high price for chemical paint and varnish removers. He therefore took his troubles to the Painters' Magazine, with the result that this authority advised the use of one of the old-fashioned alkaline paint solvents which costs but little. It suggested the following method:

Dissolve say ten pounds caustic soda or saponified lye in five gallons of water, and stir into the solution five quarts mineral oil (the cheapest grade will answer), then add enough sifted sawdust until you have a pasty substance that will hold on a wall without running down. Plaster this thickly on the old paint and in a few hours you can scrape off the resolved substance. Then, if you wish to repaint the wall, rinse well with clear water and apply a coat of vinegar to neutralize the alkali that may have remained in the pores of bricks or stones.

Or you can slake in one vessel a quantity of builders' lime and in another vessel dissolve a similar quantity, by weight, of soda ash, leaving both stand overnight, mixing the liquor from the soda ash with the slaked lime next day, adding enough whiting to make a paste, applying this to the old paint. In this case it is also necessary to rinse well the wall from which the paint has been removed and give a coat of vinegar before repainting. There are numerous other ways to produce alkaline paint and varnish removers, but those given are least costly.

The Canadian Builder

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OUR ORGANIZATION COMPLETE.

In sending out the second number of The Canadian Builder we are glad to inform our readers that the new organization is now completed. When we took over "The Builder and Contractor" we were under the necessity of building up a separate organization to take care of it.

The organization has been completed by the inclusion of Mr. C. H. Moody, formerly on the staff of the Acton Publishing Co., Ltd., as editor. Mr. Moody was closely identified with "The Builder and Contractor" and we feel confident in promising a substantial advance in the editorial standard of the paper from month to month while under his direction.

The general lines of policy laid down in last month's issue will be followed, but we hope to make the paper of steadily increasing value to the practical builder. To this end arrangements are being made for series of articles by practical men who are authorities in various branches of the building trades.

A NOTE TO OUR SUBSCRIBERS.

We want to again state that this paper will be published monthly.

All who subscribed on the understanding that they were to receive 24 issues in the year will be sent 24 issues of the paper from the date of thir subscription.

All subscriptions received prior to October will be extended two months, owing to the fact that no paper was issued in August or September.

We have a good supply of March 15, May 15, and June 15 numbers, and we shall be glad to forward copies of these to subscribers on application.

THE PREVENTION OF CITY FIRES.

The recent conflagration in London, Ont., has reopened the question of fire prevention in our cities and towns. The matter calls for serious attention and resolute action. Fortunately this is a young nation, and we are in the happy position of being able to avoid the mistakes of other nations, if we will. A solemn warning is furnished by the example of our nearest neighbor, the United States, where the annual loss of life and property through fire is appalling.

Cannot something more be done to encourage the erection of fireproof buildings? The insurance companies are doing a good work in this connection by the substantial reduction in rates of insurance on fireproof structures. The building by-laws in many places are stringent, but in a large number of them it is left to the Chief of the Fire Department to see that they are enforced. It appeals to us that here is an opportunity for our civic authorities to play a conspicuously useful part in the right development of our country. Why should not our city and town councils take their cue from the insurance companies and offer a reduction in taxation on all new fireproof or fire-resisting buildings? The concession would have to be large enough to constitute a real inducement, but the civic revenue would not necessarily be seriously affected thereby, as property is taxed according to its value, and fireproof buildings are more costly than those constructed without special regard to the risk of destruction by fire. Progressive municipalities all over the Dominion are conducting costly publicity campaigns, a special feature of which is the inducement given to manufacturers to start industries. In some cases sites are offered free, in others exemption from taxation from a certain period. This principle might be applied to fire prevention at home, with lasting benefit to the community. The presence of one fireproof structure in a block is regarded by the insurance man and the fireman as a fire stop. If fire breaks out in one part of the block the intervening fireproof building may stop the fire from spreading to other parts, as well as offering a safe vantage point for the firemen to fight the fire. Multiply the number of such buildings and you reduce the risk of a general conflagration. In the building of a ship ample provison must be made for withstanding the stress of storms, and fire, like wind and water, is a great force of nature that must be reckoned with. It is only common sense to make allowance for it in the construction of our growing cities and towns. Incidentally the encouragement of the erection of fireproof structures would raise the local standard of building.

That suggests another aspect of the question—the part of the builder in the matter. To what extent does the builder himself work for the prevention of fire? If the shipbuilder constructing his vessel work keeps the possibility of storm ever before him, does the builder of the house, the store or the factory keep before him the possibility of fire? Of course if an architect plans a building on fireproof or fire-resisting lines or specifies fireproof materials wherever possible, the builder has only to follow his instructions. But in many of our smaller towns the builder makes his own plans and works accordingly, and in such cases we wonder how many builders urge their clients to have buildings made on fireproof lines. Of course in so doing the builder would lay himself open to the charge of trying to increase the outlay, but a sensible man should need no convincing of the desirability of having his place of business or dwelling made as immune as possible from the risk of fire.

A contemporary recently published an article headed "The Importance of the Building Contractor in Community Development." In this connection the builder certainly has a chance to become a most helpful factor in civic development. We might proceed further and discuss the architect's side of the question, but we have said enough to ventilate the matter and we sincerely hope to arouse a practical interest in it. We would welcome individual expressions of opinion on this important topic from some of our readers.

THE BUSINESS END OF BUILDING.

The importance of scientific business methods in all departments of commercial activity is emphasized with increasing force every day. Up-to-date advertising, the widespread use of new systems for regulating expenditure, keeping track of materials and the avoidance of leakage, are all evidences of the growing recognition of the importance of the purely business end of any enterprise. The business end is quite as important in the building and contracting trade as any other, in fact it is more so, because in the very nature of things the builder has to give a large proportion of his time and effort to the handling of materials and supervision of labor, in the pressure of which he is apt to overlook or neglect such matters as bookkeeping, etc. This, of course, relates particularly to the man who is in a small way, as big firms executing large contracts have properly organized clerical departments. In view of this we purpose to publish from time to time articles dealing specifically with the "Business End of Building." Storekeepers constantly speak of the benefit they derive from articles of this nature in the trade journals published for their special benefit, and we wish to put within the reach of all readers of "The Canadian Builder" help of a similar kind. We will welcome suggestions from our subscribers along this line, as we are anxious to make our journal of real practical service to all who peruse its pages.

THE DUTY ON STONE SHOULD BE ADVANCED.

There is one aspect of the tariff question which has a vital bearing on the building trade of Canada, viz., the duty on stone. At present the duty is

15 per cent. ad valorem on raw or undressed stone.

20 per cent. ad valorem on sawn or otherwise dressed stone.

30 per cent. ad valorem on "manufactured" stone.

The 30 per cent. rate is practically a dead letter, as all such stone now enters at the 20 per cent. rate.

The United States tariff is 50 per cent. ad valorem on sawn, hewn, dressed, polished or otherwise manufactured stone.

A glance at these figures will convince any person familiar with the stone trade that Canadian stone is thus placed at a great disadvantage. Further proof of this is given in the Government returns up to March 31, 1910, which show that over $300,000 of cut stone was imported, while for the same period we exported only $123. The increase in building construction throughout the Dominion during the present year has been enormous, so the figures for this period will be much larger in proportion. In additon to this a further handicap is imposed on the Canadian industry by the duty on machinery for stone-cutting purposes, 35 per cent., all of which comes from the United States On top of all this place the fact that the American railroads discriminate against the Canadian manufacturer by charging, for instance, 54 cents per cubic foot on "raw stone" coming from Indiana to Montreal, and charging only 48 cents per cubic foot on "sawn or otherwise manufactured" stone. The severity of our winter is another drawback to the stone industry in present conditions, but if the tariff were adjusted for our benefit the raw product could be handled under cover during the slack season, and in summer our stone beds could be worked on a competitive footing. This would enable us to retain our craftsmen, who are attracted south of the border by the prospect of steady employment all the year round, in spite of lower wages.

The Canadian National Association of Builders' Exchanges have taken this matter in hand by petitioning the new Minister of Finance, Hon. W. T. White, to raise the duty on United States manufactured stone to 65 cents per foot specific, which would represent about 50 per cent. of the actual value of such material. The country has declared in favor of protection by returning Mr. Borden and his colleagues to power. We hope the new Government will act up to its ideals by increasing the duty on United States stone, thus fostering what may become an important industry in Canada.

NOTE AND COMMENT.

For the benefit of those who harbor the impression that sky scrapers are confined to the business world we may remark that two apartment houses, each sixteen stories high, are now being erected in New York. Evidently New Yorkers are bent on having "mansions on high" in this life.

The Canadian National Association of Builders' Exchanges is to hold a convention in Toronto next February. A gathering of this nature should be productive of much good in a country like Canada, where phenomenal activity is one of the main features of development.

Victoria, B.C., is often referred to as the quiet city. A recent visitor to British Columbia's beautiful capital remarked, however, that the two things which impressed him most were the activity in real estate and the amazing number of houses in course of construction.

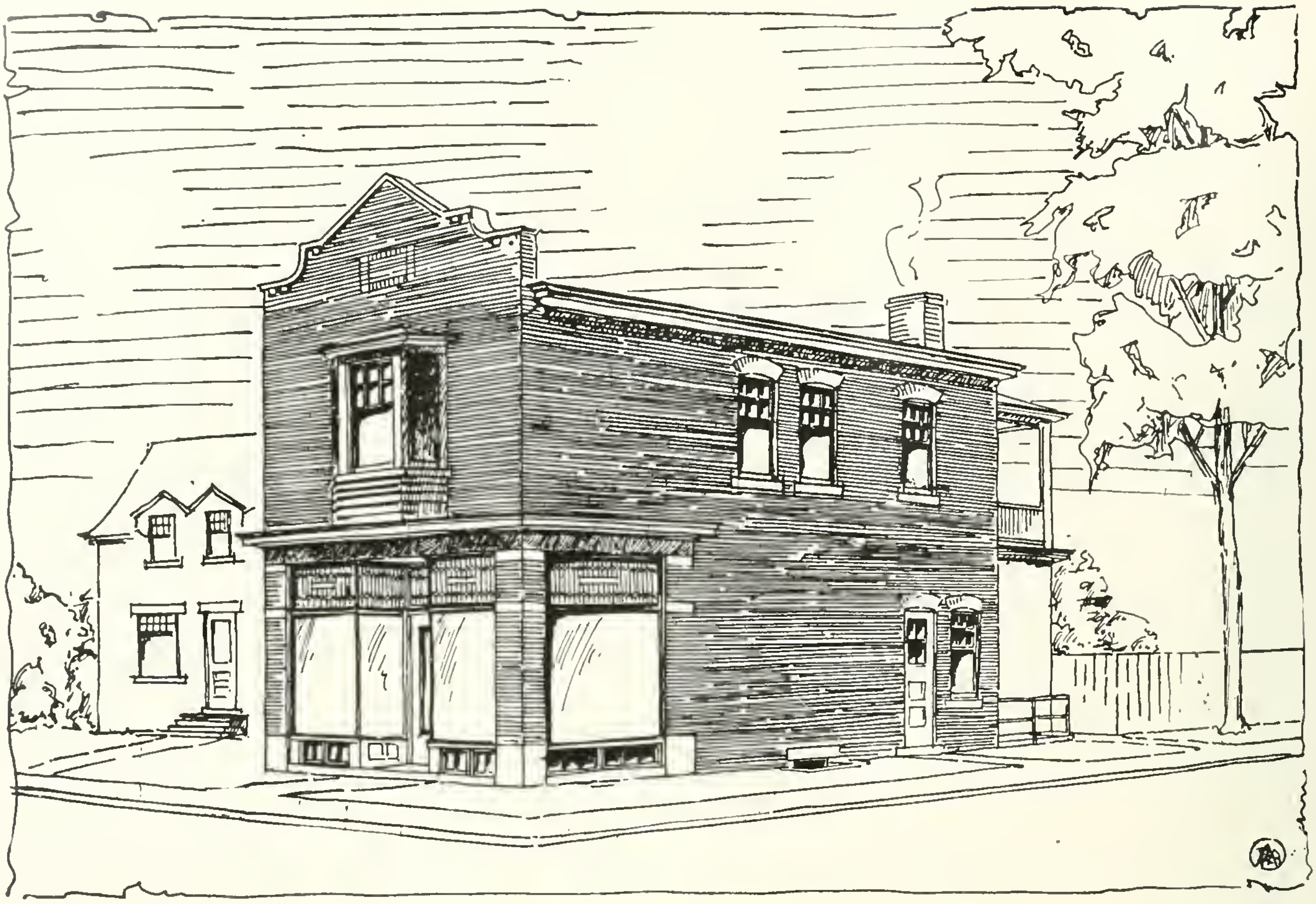
The Montreal Builders' Exchange is running a series of noonday business luncheons, which are proving most successful. Among the speakers are such prominent men as Mayor Hopewell, of Ottawa; W. H. Sayward, Secretary of the Boston Master Builders' Association; F. L. Ellingwood, Superintendent of Construction C. P. R., Montreal, and others. The business luncheon is becoming a fine feature of commercial life in our cities, combining as it does distinct educational and social advantages. We are glad to see the builders getting into line with this helpful movement.

The management of the Toronto Technical High School is to be complimented on the latest addition to its technical classes, a class for the practice of painting and decorating, the first of its kind in Canada. This was formed on October 2nd, and now meets twice weekly. There are 46 pupils enrolled ranging in age from 16 to 45. The instructor is Mr. A. Vaughan Wiggins, who is recognized as one of the foremost experts in this country on painting and decorating.

We regret that through an inadvertence owing to pressure of work at the time of transfer, the illustration of house on page 27 of our October issue was inserted in error. This had appeared previously in July.

WHY DO CHIMNEYS LEAN EASTWARD?

We notice that a reader of one of the plumbing trade journals asks this interesting question, pointing out that as far as his observation goes most chimneys, both long and short, exhibit a tendency to lean eastward. If any of our readers can offer replies to this query we shall be pleased to receive them, also to publish the most interesting.



Compact Store and Residence Which Cost Only $3,000

Designed by R. A. Abraham

The accompanying illustrations show the outlines of a compact store and house recently erected at the corner of Delaware Avenue and Main Street, Toronto, at an actual cost of about $3,000. The architect is Mr. R. A. Abraham.

The building is constructed of red brick, with grey stone trimmings, the cornices and copings being of galvanized iron.

The ground floor apartments comprise store, hall, dining-room and kitchen. Facing the staircase in the hall is an alcove, forming a suitable location for a desk.

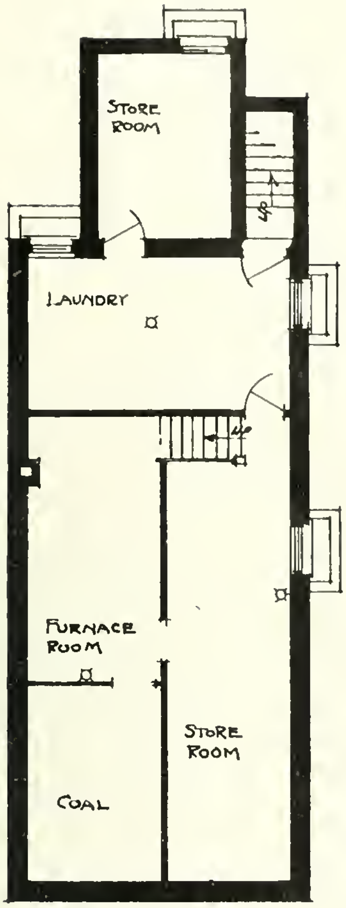
On the first floor are the sitting-room, three bedrooms and bathroom, while from the back bedroom a door gives egress to a covered balcony, which is arranged for enclosure by glass if desired. A rooflight over the stairway lights the hall.

The basement contains two storerooms, furnace room, laundry and coal cellar. A noteworthy feature is the outside stair at the back leading to the street, enabling goods to be delivered direct to the storerooms without passing through the house.

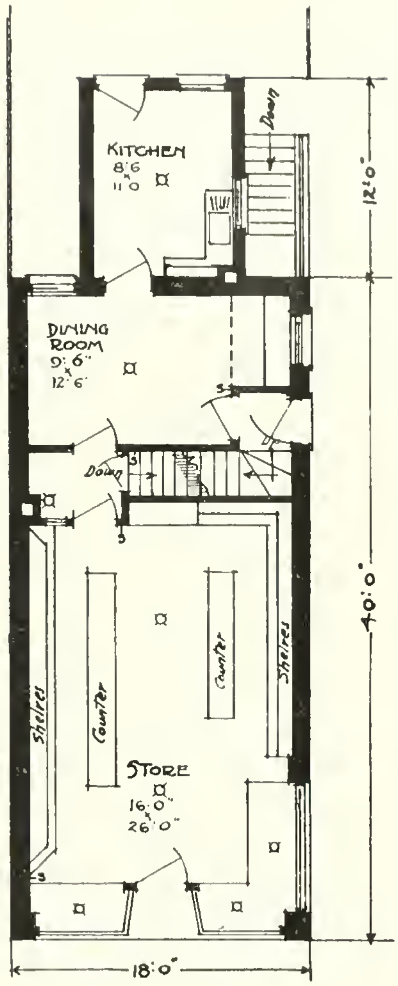
The respective height of the apartments are: Ground floor, 10 feet 6 inches clear; first floor, 8 feet 6 inches clear; basement, 7 feet clear.

Electric light and gas connections are provided throughout, and the heating is on the hot air system. The sitting-room has a fireplace for gas.

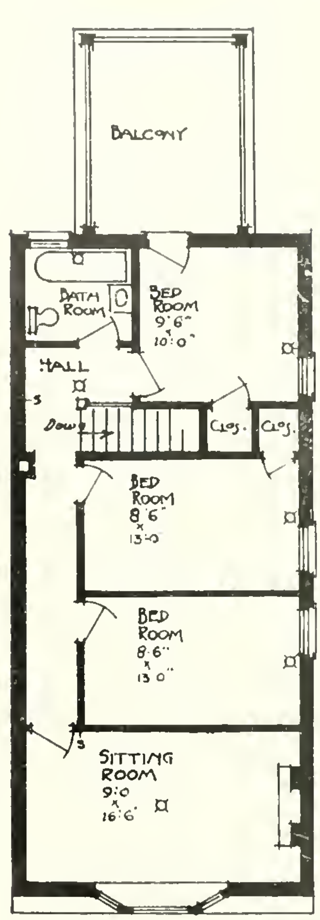
The appearance of the premises from the street is up to the standard that should be maintained in the design of an establishment located at a corner. Although erected on an 18 ft. lot, excellent use has been made of the available space, as will be seen from a study of the plans.



BASEMENT PLAN



GROUND FLOOR PLAN



FIRST FLOOR PLAN

PREVENTION AND RELIEF OF ACCIDENTS.

Heroic measures are being taken by the leading nations of the world for the prevention and relief of accidents and the Canadian Manufacturers are evidently desirous of placing this country in the van of the movement

The address of Mr. F. C. Schwedtman before the Canadian Manufacturers' Association on the prevention and relief of accidents touched upon a subject of direct interest to every manufacturer.

Mr. Schwedtman is commissioner of the National Association of Manufacturers of the United States, and has made the subject upon which he dwelt a labor of love, and the earnestness with which he presented his theme stamped it rather as an evangel than as a business proposition. At any rate the prevention and relief of accidents is more than a business matter. It is a matter of human interest. It concerns the life and limbs of thousands of workmen. And that transcends even business interests. Mr. Schwedtman, who has made a personal study of the accident prevention and relief schemes in European countries, as well as the United States and Canada, illustrated his address with views of modern protected machinery, charts and diagrams, which were thrown on a sheet by a powerful limelight lantern. That everyone of the several hundred persons present was impressed was quite evident.

While Mr. Schwedtman showed what was being done by many nations, particularly Great Britain, Germany, France, Switzerland, the United States and Canada for the prevention and relief of accidents, the golden thread running through his address was the imperative necessity of co-operation between employer and employee. It was the spirit not the letter of the law that was most to be desired. The German system was the one he most favored. There the government, the employer, and the employee all, under compulsion, contributed to a fund for the relief of injured workmen. The British system he declared to be the worst among the nations. For accidents responsibility rested upon the employer, the employee and the state and each should therefore contribute to a compensating fund for the relief of the injured workman. And to this there was a loud amen from the audience. Of all the nations, Canada he held was in the most favorable position for working out ideal laws for the prevention and relief of accidents.

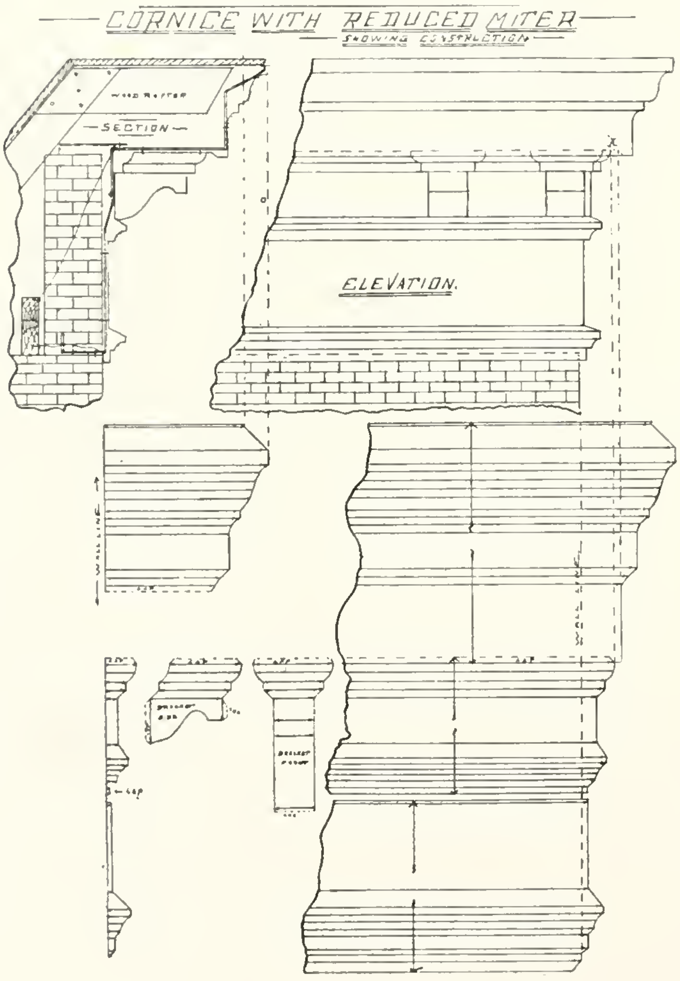
The members of the Canadian Manufacturers' Association are keen business men, but a sympathetic heart for the welfare of the workingman more than once revealed itself during the convention, and before the close of the convention a strong committee was appointed to make a thorough study of the subject. The character of the men who compose the committee is a guarantee that their task will be well done.

CORNICE WITH REDUCED MITER.

By G. L. Gray

This drawing shows the elevation and section of a cornice with projection reduced and the miters developed from it, the cornice being reduced in the soffit as at A.

To develop the miter for the full projection take the stretchout of full projection of section and place stretchout as shown on wall line and draw lines indefinitely from all spacings at right angles with wall line, which is the stretchout line. Next drop lines from all points in section to corresponding lines in stretchout. Drawing lines through the intersecting points in stretchout lines will give the pattern for full projection. This same method is used to develop patterns for crown, bed and foot molds for any square return miters. The patterns for the reduced projections as



shown in elevation are gotten by the same method as just explained for full projection of section. The stretchout for reduced projection must be taken from reduced profile A of elevation continuing as before explained. The patterns for brackets are gotten by the same method.

This section also shows the iron braces to stiffen cornice marked for bolts at suitable parts of brace. It also shows the wall anchors required to be bolted to the iron braces and extend back and turn down in brick cornice backing. It also shows the temporary wires which hold the cornice until the wall anchors are bricked in.

CEMENT AS AN IRON PRESERVATIVE.

Tests are to be made by the Panama Canal Commission to determine the value of cement mortar, applied to iron plates by the "cement gun," as a preservative of iron. Twelve plates, 63-8 by 14 inches, have been coated with a 1 to 3 mortar of cement and sand, after they were cleaned to grey metal by the sand blast process. Six of these have been covered with a $\frac{1}{2}$-inch coating, and the remaining six with a one-inch coat on one side, and a $1\frac{1}{2}$-inch coat on the other. Three plates of each kind have been sent to Balboa, and three to Cristobal, where they will be kept immersed in salt water to test the mortar method of preventing corrosion. Two plates of each kind will be taken from the salt water bath at the end of three months, and one-half of the coating will be removed to determine the condition of the metal. The duration of the test for the balance of the plates will be determined later.

SUCCESS

So much has been written about success that many imagine it is some vague, mysterious unknown power which is the special privilege of the few. But this is false; success may be defined by one word—achievement. He who plans anything good or noble, and completes his plans, achieves success.—*Joseph Wesley.*

WHY THE BOILER WOULDN'T WORK.

A Toronto man recently had an experience with his hot water plant which may prove of interest to the readers of the Journal. He had built, in the suburbs, a fine residence and the heating plant which had been put in was deemed to be quite adequate, but when the cool fall weather came around and heat was wanted it was found impossible to get satisfactory results.

Nothing daunted, a larger boiler was secured and still the radiators refused to give out enough heat to warm the house.

One morning a few days ago an expert was called in and up to the time the owner left for his office the former seemed unable to discover the cause beyond the fact that the combustion was at fault.

So discouraged was the owner that when he arrived in town he made arrangements for his family to live for the winter at one of the leading hotels. When he telephoned his wife in the evening informing her what he had done, he met with the response that there was no necessity for him doing so as everything was now all right with the heating plant. He then learned that the expert had discovered that the fault was not with the boiler or radiation, but with the chimney, a quantity of rubbish having been left in it by careless workmen.

KNEW THE AUGER WHEN IT WAS A GIMLET.

In a New Brunswick village, a town character who preferred emphasis to the verities, was a witness in a petty trial involving an auger. He positively identified it as the property of the parties to the suit.

"But," asked the attorney for the other side, "do you swear that you know this auger?"

"Yes, sir."

"How long have you known it?" he continued.

"I have known that auger," said the witness, impressively, "ever since it was a gimlet."—Everybody's Magazine.

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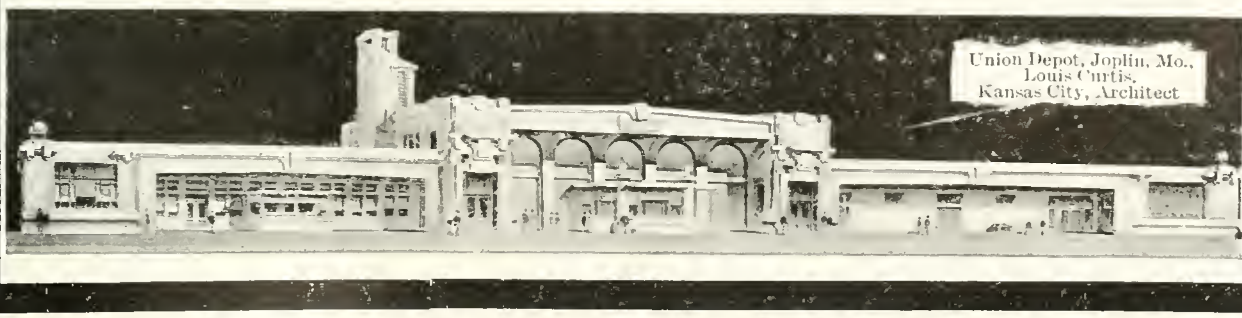

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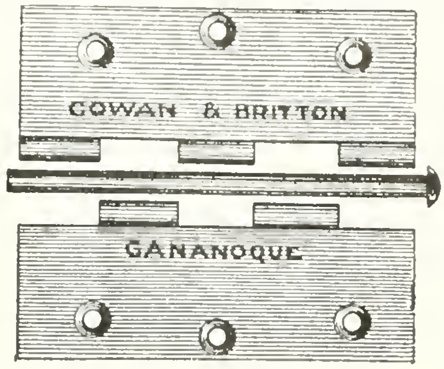

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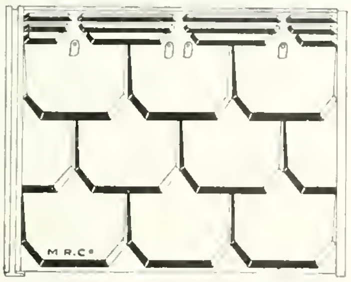

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