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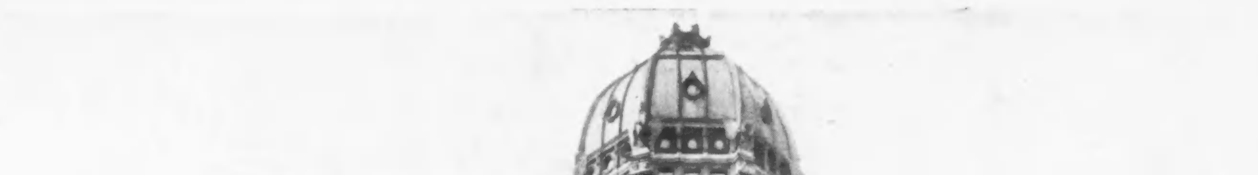

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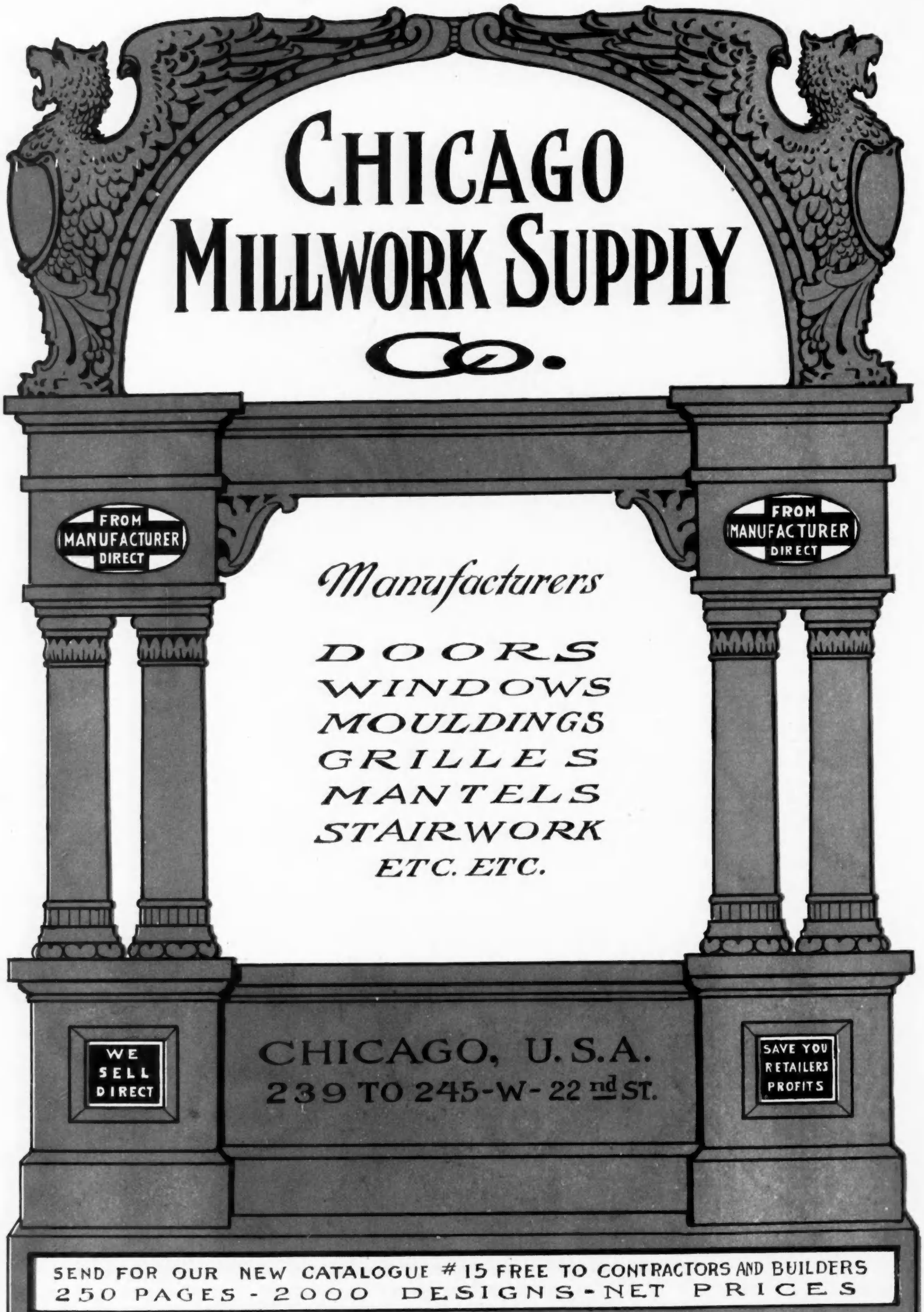
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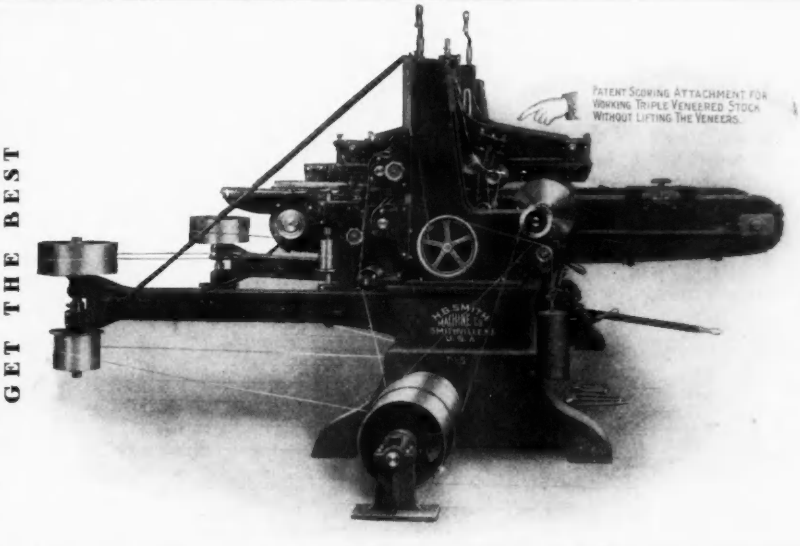

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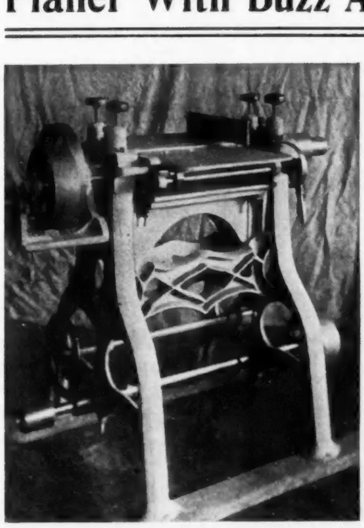

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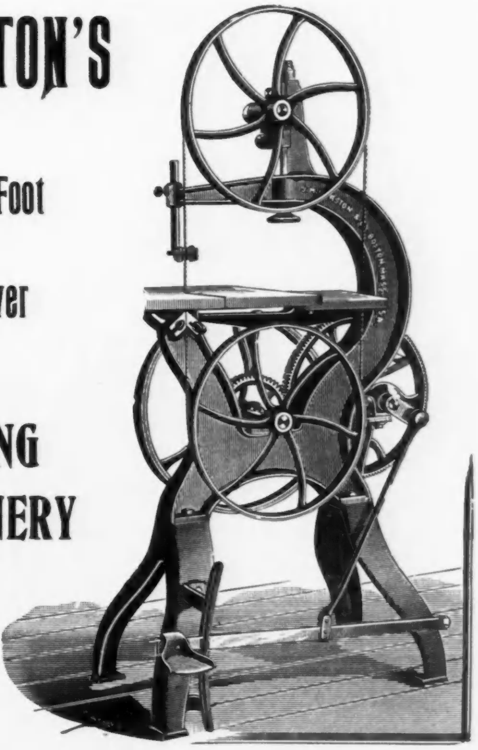

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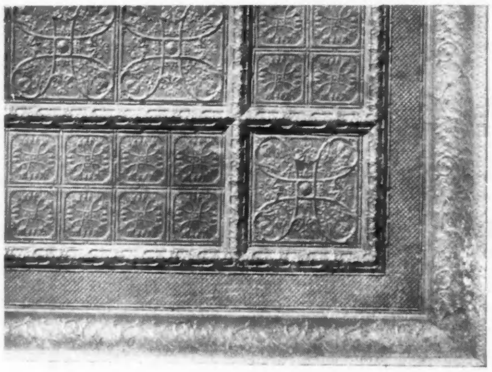

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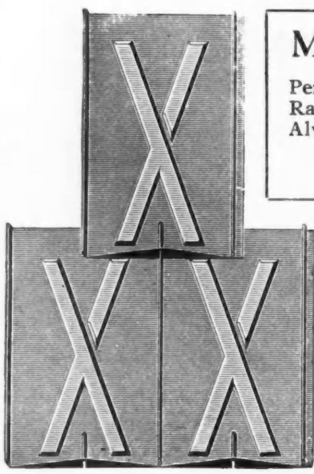

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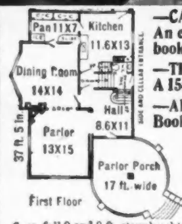

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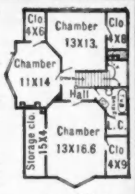

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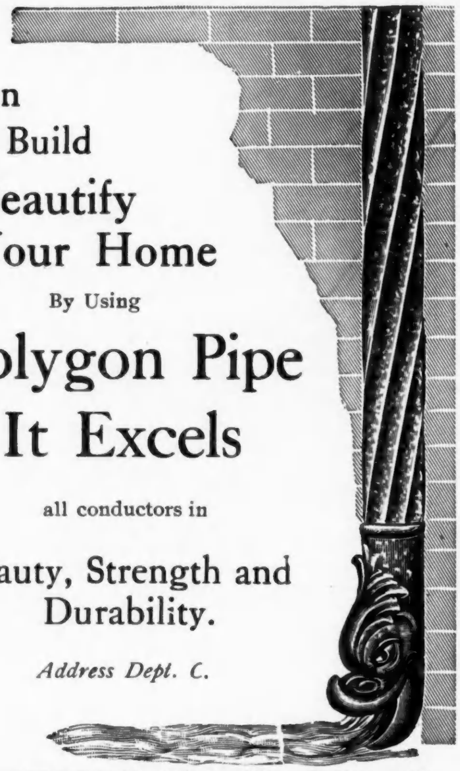

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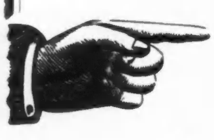

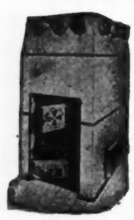

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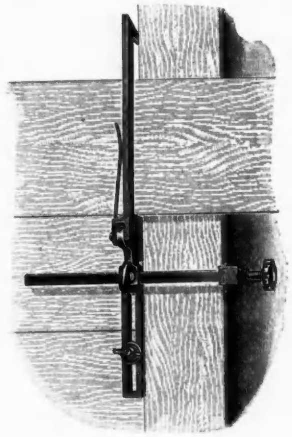

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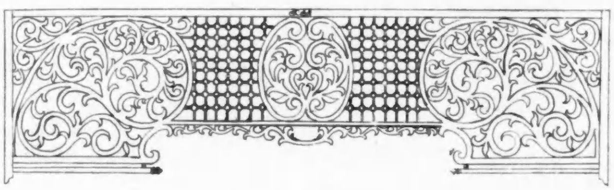

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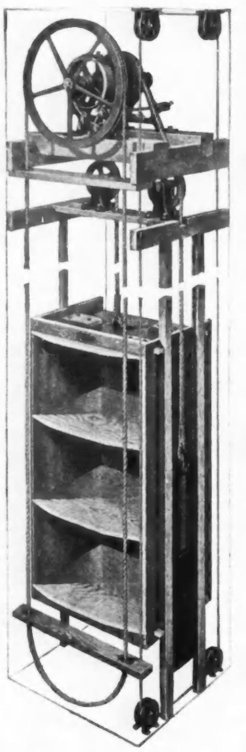

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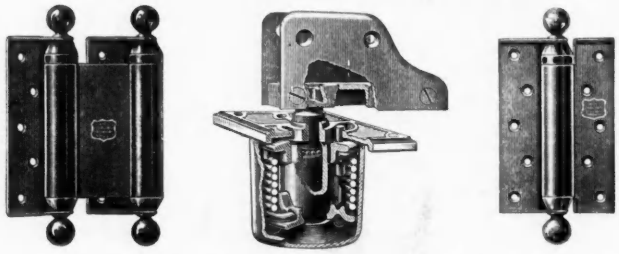

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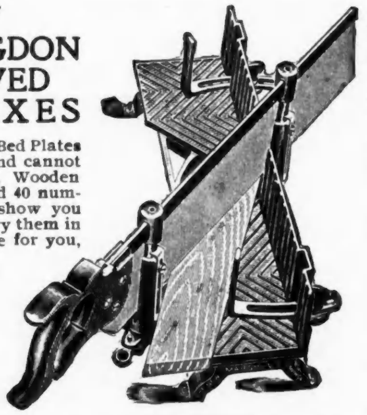

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American Carpenter and Builder

Entered as second-class matter July 1, 1905, at the postoffice at Chicago, Ill. under the Act of Congress of March 3, 1879.

WILLIAM A. RADFORD, EDITOR.
WILLIAM REUTHER, ASSOCIATE EDITOR.

Published monthly by

American Carpenter and Builder Company
196 FIFTH AVENUE, CHICAGO.
O. F. BYXBEE, General Manager.
E. L. HATFIELD, Assistant Manager.

NEW YORK OFFICE, 253 BROADWAY
EGBERT DAYTON, Manager.

VOL. I. MARCH, 1906 No. 12

The AMERICAN CARPENTER AND BUILDER is issued promptly on the first of each month. It aims to furnish the latest and the most practical and authoritative information on all matters relating to the carpentry and building trades.

Short practical letters and articles on subjects pertaining to the carpentry and building trades are requested.

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IT is no more a pleasure to the other fellow to hear you brag than it is to you to hear him at it.

THE workman who uses a hammer for a mallet belongs to the same class as the man who uses a monkey wrench for a hammer, and never deserves to attain much success until he learns better.

A CERTAIN element of system is essential to good work, but system will never take the place of brains and should never be used to an extent where it will hamper the free exercise of one's thinking apparatus.

THE man that lets his business run him is in for a hard race of it and should strive to reverse matters and run his business. But, this does not mean that one should carry a chip of resentment on his shoulder for any and every man who seeks to counsel with him.

A Door-Hanging Discussion

IN OUR correspondence columns this month, we are devoting considerable space to the ideas of a number of our readers as to what constitutes a good day's work in hanging, fitting and locking doors. The many letters we have received on the subject have been both interesting and instructive and we are pleased to note the interest our readers have taken in the matter. If a man hangs, fits and locks from four to five doors in a day and does it in a workmanlike manner, he has done a good day's work. It is not alone the quantity of the work which counts, but also the quality. We shall be pleased to have our readers express their opinions of a day's work as compared with Uncle Rural's scrap book in this issue. These opinions will be published from month to month, and we are sure will prove profitable to all.

Our Anniversary Number

WITH this issue we close our first year, a year of unheard of progress and success. A glance at the magazine will show whether or not we have been successful in pleasing our rapidly increasing family of subscribers and advertisers. We have endeavored to give you the best that could be had anywhere, engaging the best men in the country on the various subjects. The magazine the coming year promises to far surpass previous issues, as it will contain newer ideas, newer methods and even a greater variety of profitable information.

In our April issue, which is going to be our Special Anniversary Number, we will give you an example of what to expect during the coming year. It is going to be an annual worthy of commemorating the growth of a family which is without an equal, and we will make our readers feel justly proud of belonging to this great family of readers of the American Carpenter and Builder.

The Flowers that Bloom in the Spring—We hope you are Getting your Share of Them

"What's the Use?"

BY WM. R. MARSHALL

HOW often we hear some young man say: "Oh! What's the use? I haven't any show to make anything or be anybody nowadays. Every opportunity is hereditary. It is not like it used to be when the successful men of to-day got their start."

Have you met the young man? Are you one of them? If you are, just take up another hole in your belt and sit up and "take notice." Things are not as they used to be! The pace is swifter, the opportunities greater, the world more progressive and more aggressive.

Don't be like Booker T. Washington's nigger, who doubted the efficacy of prayer, because the Lord did not send him a chicken whenever he prayed for one, but change your prayer as the colored gentleman did when his eyes were opened as to the proper way and pray to the Lord to send you to the chicken and you will generally get one.

Don't sit in a cloud of obscurity and expectation waiting for opportunities to come to you, but put on your coat and hat and go out and find them; they may be elusive and hard to find, but if you are persistent and untiring, the chase is certain to be remunerative.

Some time ago, I heard a young carpenter venture the information in reply to the question, "How's business?" that "it was slow, hard work for a young fellow just starting, all the good jobs seemed to be nailed down and clinched by the old-established firms, before I get a chance at them." Seniority and reputation were all against him, which reminded me of a little story:

"Ten or twelve years ago, in a fair-sized town, there were four or five firms engaged in the contracting business who had been engaged in their respective trades for a great many years. All of these men laid great stress on the fact that they had been established for ten, fifteen or twenty years,—whichever it happened to be, and were doing the major portion of the work to be done; but it came to pass that on one fine spring day, a young man with an elastic step, a patent-leather shine and a head full of ambition dropped off the train to look the town over with the object in view of locating there in the contracting business. After spending several weeks there, he arrived at the conclusion that it was just the town he had been hunting for, so after finding a location, having the letter and bill-heads printed, and a wagon built, he adopted the symbolical sign: "Established To-Day." It appeared on the signs; it appeared on his stationery, and it appeared on his wagon. It seemed to mock the Father of Tradition held so dear by the world at large: "Time."

It was new; it was bold, and it smacked of the right spirit and it made a hit! People remarked about it; then people thought about it, and the more they thought about it, the more they talked about it; and the more they talked about it, the more business it brought. To-day he is the largest constructing contractor in that part of the country and the aphorism: "Established To-Day," is still his motto.

The past is a mistake—mostly—and is only valuable in proportion to the benefit which we derive from its lessons; the uncertainty of the future has ruined millions who have neglected the present to gamble with its mysteries. Your future is what you make it; therefore, let it be resolved that inasmuch as your happiness, your prosperity and your worth to yourself and to mankind depend upon your appreciation of the value of the present that you be "Established To-Day."

"What's the use" never won fair lady, or anything else. Take for your motto: "Established To-Day" and then say: "It is up to me" and go out and win!

Success

THE world pays tribute to "Success." Nothing succeeds like "Success." Sheridan says: "The surest way not to fail, is to determine to succeed." Maudlley, in "Body and Soul," says: "For in every voluntary determination, there are certainly two elements,—the consciousness of energy or effort, and a distinct feeling of satisfaction in making the effort." Men often fail because they are not capable of voluntary determination to succeed,—a state of affairs probably due to a great many causes, such as lack of ambition, laziness or a feeling of conceit in themselves which clouds the horizon of their possibilities, inasmuch as they never see the necessity of striving to eclipse their accomplishments, consequently, they are soon replaced or outclassed by the man of untiring energy, who is always conscious of the need of voluntary determination to succeed. The feeling of satisfaction in making the effort, spurs him on to greater energy, and the result is the successful man.

Determination, supplemented by enthusiasm, is a hard combination to beat. Enthusiasm generally emanates from honorable and edifying motives, impressions or opinions, whether correct or erroneous, and is one of the fundamental qualities to successful venture, either in politics or business. There is but one standard in the Mercantile World by which all men are judged, and that is "Success."

If a young man starting out in life as a carpenter, has no other ambition in life than to be nothing more than a carpenter, nothing short of a special act of Divine Providence will make him anything else, but let a young man become enthusiastic over the possibilities, which good, brainy carpentry can gain for him and back it up with the determination to succeed, and the limit of his possibilities is incomprehensible.

"The world pays tribute to success."

Forming of the Clear Water Club

BY J. CROW TAYLOR

WHEN the boys gathered the second time to complete the formation of the local carpenters' association in the dining-room at the home of Uncle Rural there was evidence that this genial philosopher had something new up his sleeve to spring on the crowd, for standing on the dining table was a deep glass bowl. It was not empty this time, but was filled with a clear liquid, apparently water, which had been standing long enough to precipitate quite a sediment in the bottom.

"Now, look here, Uncle Rural," said Mosby, "I see you have got a new trap to spring on us, and you have taken the wind out of our sails so often that we are getting on to your curves and are beginning to watch out for you. I propose, therefore, that before we proceed to the formation of our club and the offering of ideas and suggestions to work on, that you spring your trap and show us what you've got so as to give us a chance to have a last word. What have you got in this bowl and what does it signify?"

"What I've got in that bowl," Uncle Rural replied, "is the result of some study and experiments in water purification. In making a study of water and the various methods by which it is relieved of certain objectionable elements and made clear, I find several methods. One is known as subsidence, which means time to settle; another filtration, which means sifting out, and then there is oxidation, which involves the mixing in of other substances; there is boiling to destroy the vitality of microbes, and there is precipitation, and it is this last that I have been making some experiments on. I find that alum when added to murky or muddy water will cause precipitation of the mud and various other objectionable substances and leave it clear, and it just struck me that that is what I wanted to do with the ideas you boys bring here—add a little alum to those that are not clear so as to precipitate the murky matter and enable us to see more clearly through the idea. Some of the other means that are adopted for purifying water might also be worth consideration in connection with purifying or making clear our ideas. But, for the present occasion, I concluded to try the alum idea. You boys furnish the ideas and I'll furnish the alum, and if I use too much I don't want you to hesitate to tell me about it. You will find in this connection that when too much alum is used it is injurious. No more should be made use of than is necessary to accomplish the effort of purification."

"Well, Mosby," said Abe Watson when Uncle Rural had finished explaining his experiments with water and his application of this theory to test the clarifying of ideas, "I think that instead of getting ahead of Uncle Rural that he planned so as to have you call on him to explain that trap of his first. That is a funny sort of an idea all around, but if Uncle Rural says it is all right it goes with me, and I make a motion that we call our association the 'Clear Water Club,' and then put in our ideas and let Uncle Rural salt them down with alum, clear the mud out and enable us to see through them more plainly."

This idea met with favor, and those present, which included a half dozen local carpenters besides Uncle Rural, proceeded to the formal organization of the club, electing J. B. as secretary and Pete Tully, one of the oldest local carpenters aside from Uncle Rural, as president. This latter honor was tendered Uncle Rural, but he declined, saying he wanted to feel free to talk along with the other boys. With the organization completed Tully took the chair at the head of the table and called for the ideas of those present on what matters could be taken up to advantage by such an organization.

"I'll start the ball to rolling," said J. B. "I have figured out that there is lots of wasted mental energy in connection with the placing of nearly every house contract. Each prospective contractor is given the plans, and from these estimates figures out what it would be worth to build the house, and by this method there is seldom less than six sets of figures made for every house and sometimes more than a dozen, from which the builder selects for use, of course, only one set. What I propose is, that instead of doing individual figuring, that we have some one man in the club to act as estimator, so that when a new house is offered for bids only one set of detail figures need to be made for the use of all men in the club as bidders."

"Whew!" said Mosby, "that sounds like forming a trust."

"No," said J. B., "that's not what I mean. I mean that we should discuss the subject of figuring among ourselves and agree on a method of estimating the various details of work, and then that some one man do the figuring on a predetermined basis of estimate for the cost of work and material on every new house that is offered, and then each member can, without having to figure out all the details for himself, take these estimates as a basis to work on and make his bid for whatever margin of profit he feels inclined. It is simply a matter of saving a lot of time that is wasted by a lot of different men figuring on the same thing."

"That is better," said Mosby, "but even so, I think I can butt in ahead of Uncle Rural and add a little clarifier to your ideas. Admitting that waste of energy is deplorable, we must remember that the exercise of a faculty is essential to its retention and development. Figuring is good mental exercise for any carpenter in more ways than one, and most of us don't figure enough as it is. If we go and reduce it more yet by making it unnecessary for a man to figure on the details of work, the result will be that by and by we won't be competent to figure, and then when we get away from our base of information, out of touch with the club, we will find ourselves worse off than ever. Am I not right, Uncle Rural?"

"As a general rule," said Uncle Rural, "it is much easier to cut the first half of a miter joint than it is to fit the last half to it, and it is sometimes the same way in our talks and ideas; we get the first half of them about right, but don't make a close joint with the latter half. In other words, your idea is cut out right in the first half but it is not properly joined to J. B.'s section.

"Figures, like children, are a mighty good thing to have in the family, and both are popular these days. The popularity of children has been helped along by the president and the popularity of figures has grown up from various sources, including association work and strenuous efforts on the part of business colleges which turn out experts in this line. It is a great fad these days for those engaged in any industrial line to meet together occasionally and at these meetings one of the most prominent topics is that of figuring and discussing the cost of making this article and doing that and the other thing. It is proving to be an eye opener, too, and it seems to me that we carpenters can stand quite a lot of it without hurting us any. Joining your idea and J. B.'s together properly makes this. We need to figure, each man of us, and it will be good for all of us to get together and compare our figures and discuss the differences. What we need to get is more uniformity in figuring among ourselves and a better understanding of each other and each other's methods and figures. It used to be when I went to school the teacher would give us a problem or sum to do in arithmetic, put a row of us up to the blackboard and each one of us was supposed to get the same answer to the same problem Now, then, how many of us do you suppose would get the same answer if we were all given at the same time the same piece of work to figure on? We would likely all get different answers. Then how would we know which was the right answer?

"I have here a scrap book in which I paste things once in awhile that I think are of special interest, and one of my recent additions to this is a set of figures on what a carpenter can do, or what constitutes a fair day's work of eight hours for an average carpenter, that has been going the newspaper rounds. I don't know just where it started, or who originated it, but here it is:

Can cut and lay 500 feet of sheathing boards.

Can cut and lay 250 feet of siding or clapboards.

Can cut and lay 2,000 shingles.

Can place in position 750 feet of joists.

Can place in position 500 feet of studding.

Can place in position 400 feet of four-inch flooring and 300 feet of two-inch finish flooring.

Can fit 150 lineal feet of baseboard—one member.

Can fit 100 lineal feet of baseboard—three members.

Can case 12 doors and windows—one member casing.

Can case eight doors and windows—two members casing.

Can fit and hang four doors.

Can fit locks on 12 doors.

Can fit and hang 10 two-sash windows.

"Do you propose," said Tully, "to put that up as a guide or standard table for us to work from in compiling figures?"

"No, I am merely holding it up to illustrate a point or two. One of them is, that there are lots of us who while we may have ideas on the subject really don't know whether this estimate is correct or not. Again assuming that it is not sufficiently correct to be satisfactory, and it should be desired to make a more equitable estimate, I don't believe, taking the matter as a whole, that any two out of six of you would agree as to what should be an average day's work."

With that Uncle Rural closed his scrapbook and the discussion for the evening soon ended.

Now, what I am wondering about is, how near correct was Uncle Rural? Suppose some of you readers who are adepts with the pencil O. K. or revise this estimate according to your ideas, send it in to the editor and let us see what the result will be.

Steam Fitters' Cement

The following formula for steam fitters' cement was presented by S. S. Sadtler in a paper read recently before the Engineers' Club of Philadelphia. The body of the cement consists of either red or white lead. The red lead is often diluted with an equal bulk of silica or other inert substances, so as to make it less powdery. The best way that I have found to do this, however, is to add rubber or gutta-percha to the oil as follows: Linseed oil, 6 parts by weight; rubber or gutta-percha, 1 part by weight. The rubber or gutta-percha is dissolved in sufficient carbon disulphide to give it the consistency of molasses, mixed with the oil, and left exposed to the air for about 24 hours. The red lead is then mixed to a putty. Oxide of iron makes a less brittle cement than red lead. Probably fish oils and red lead would make good cements of the class for joining pipes, as the fish oils are not such strong drying oils as linseed, and their use might be a case of permissible substitution rather than adulteration.

No friendly wind is going to pilot your business ship into the port of profit. You must map out the course of your entire business voyage before you lift the anchor of initiative or set the sail of action.

A slow factory elevator is like a slow man—it may be good, but it might be better.

Steel Square

ALFRED W. WOODS

How to Use the Steel Square

SHOWING HOW TO PROCEED WITH THE STEEL SQUARE TO OBTAIN THE LENGTHS OF THE VARIOUS RAFTERS FOR ANY WIDTH OF BUILDING, ALSO HOW THE SAME MAY BE ACCOMPLISHED BY USING THE DECIMAL SYSTEM

IN THE last number, we closed with an illustration, showing the comparison of the runs of the octagon hip and for a hip resting on a square cornered building, to that for a one-foot run of the common rafter.

Now since these lengths taken diagonally from 12,

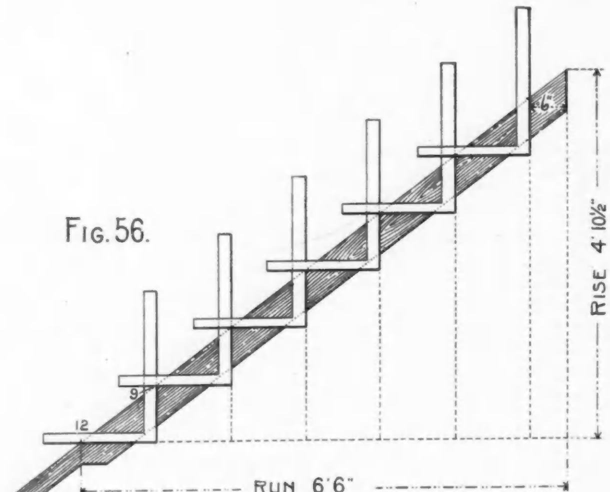


FIG. 56.

13 and 17 on the tongue to the figures designating the rise on the blade represents the lengths of the rafters for a one-foot run, it is an easy matter to find the lengths for any run by simply multiplying the lengths given by the number of feet and fraction of a foot in the run, and point off as many figures in the product as there are decimal figures in the solution and reduce to feet and inches. The finding of the length for a fractional part of a foot in the run may be avoided by finding the length only for the number of feet as described above and lay off a plumb cut, then from this measure square out the amount of the fraction, which will be the point for the proper plumb cut. Or the calculation in figures for the whole length may be avoided by running the square as shown in Fig. 56. In this is shown a rafter with 6 feet 6 inch run and a 9 inch rise, or ⅜ pitch. Apply the steel square six times as shown, then measuring six inches square out from the last application of the steel square, will give the point for the plumb cut. Proceed in like manner for the corresponding hips, using the figures 13 and 17 on the tongue respectively for the octagon and common hip or valley, but instead of measuring six inches square out as for the common rafter, it must be to the ratio of 13 and 17, as 6 is to 12 inches.

Therefore in this example, it would be 6½ inches for the octagon hip and 8½ inches for the hip, or valley, for the square cornered building.

In Fig. 57 are shown these proportions in connection with the steel square. The run of the hip for a square cornered building rests at 45 degrees from that of the common rafter and that for the octagon hip at 22½ degrees. So then, we left the tongue of the square represent the run for the common rafter, and by laying off the diagonal lines to 5 and 12 (the figures that represent the degrees) on the blade, and by squaring up six inches to the right of the starting point (12 on the tongue) it will be seen the diagonal lines are cut at the center of their lengths. Therefore, one-half of their lengths represent the amount to square out to correspond with a six-inch run of the common rafter.

This proportion exists at any point that may represent the fraction of a foot in the run. If the fraction be one inch, the scale

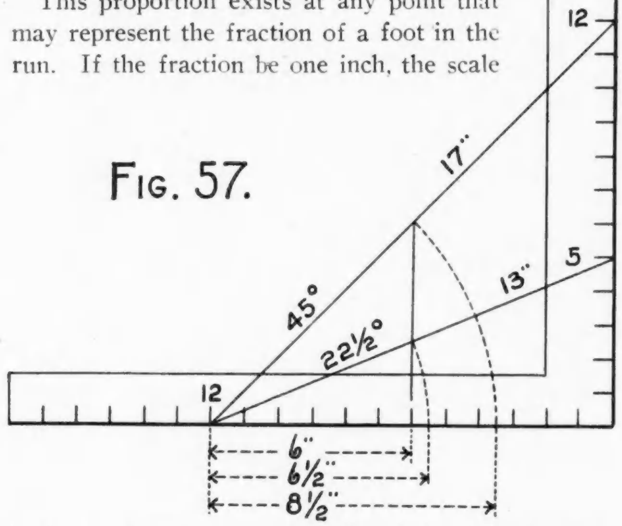


FIG. 57.

is then reduced to one-twelfth of the full size, and these lengths are simply read as twelfths inches, instead of inches.

Great care should be exercised in making measurements as shown in Fig. 56, as it is a very easy matter to get off a little each movement of the square, and for that reason it is better to multiply the decimal lengths given in Fig. 55.

For example we will find the length of the rafter shown in Fig. 56. By referring to the table in Fig. 55, we find the length for the common rafter to be 15 inches. Then 15x6½ (6.5)=97.5 inches, or 8 feet 1½ inches. For the corresponding octagon hip, the length is 15.81 inches. Then 15.81x6.5=102.765 inches, or 8 feet 6¾ inches. Bear in mind that the 102 is inches and that 12 goes into 102 eight times and six over, making 8 feet 6 inches, and the .765 is only a fractional part of an inch and is equal to only a little over three-quarters of an inch. See table of equivalents in Fig.

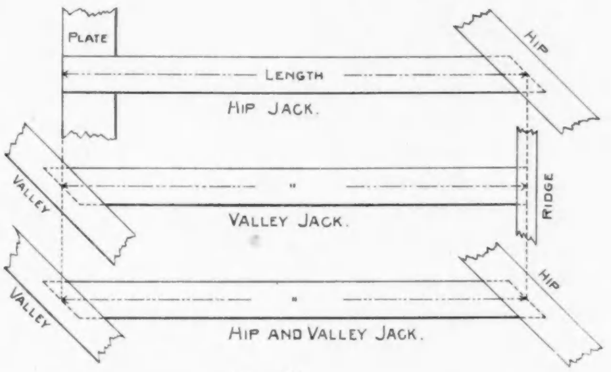


FIG. 58.

55. For the corresponding common hip or valley, the length is 19.21 inches. Then 19.21 x 6.5=124.865 inches, or 10 feet 4⅞ inches. While the lengths, 15, 15.81 and 19.21, given above, represent the rafters for one-foot run, they may also represent the length of the rafters for one-inch run, as before mentioned, and in that case the lengths given above would be so many twelfths of an inch and the decimal fractions would only be fractions of a twelfth of an inch. Thus, to find the lengths of the hip for a 7-inch run, would be 19.21 x 7=134.47 twelfths inches, equal to 11 2-12 inches. The .47 is discarded because it is less than one-half of a twelfth of an inch. This also applies to finding the common difference in the length of jacks. Since a jack is simply a part of a common rafter, it is only necessary to multiply the length of the common rafter (15) by the number of inches in the spacing and divide by 12, will give the answer. Thus—if the jacks be placed 16 inches on centers 15 x 16=240÷12=20 inches, will be the length of the first jack or the common difference for a roof with a 9-inch rise. As this example is without fractions, we will give another, taking that for the 8-inch rise or 1-3 pitch. In this, the length of the common rafter is 14.42. Then 14.42 x 16= 230.72÷12=19 2-12 inches and is the answer. To find the common difference for the octagon jack for the above pitch, proceed in like manner but multiply 14.42 by 2.4 and the product by the spacing and divide by 12 will give the answer. Thus 14.42 x 2.4=34.608 x 16=553.728÷12=46 1-12 inches. The decimal fraction in the two last examples are discarded for the same reason as before described. These lengths are calculated to a center line at the ridge and at the center of the back of the hip or valley. Therefore, reductions should be made from the lengths here calculated by squaring back from the plumb cut one-half the thickness of the ridge board, will give the point for the proper cut for the common rafters and jacks that fit against same. For the jacks that fit against a hip or valley for a square cornered building, deduct one-half the diagonal thickness of the hip it rests against, by measuring square back from the plumb cut. Rafters are usually about 1¾ inches thick and the proper reduction in that case would be practically 1¼ inches. However, the jacks will fit just as well though they will be one-half of their thickness out of their regular spacing, or if the measurement line is taken on the longside of the jack, then they will be of the proper length without any reduction.

There are several kinds of jacks and while we are at this point it might be well to describe them. They are known by the position they occupy as follows: A jack with the upper end resting against a hip is called a hip jack. A jack with the upper end against the ridge board and the lower end against the valley is called a valley jack.

A jack cut in between a hip and a valley is called a hip and valley jack, or more generally known as a cripple jack. The latter in many cases is a very appropriate name, however, we prefer to call them by the former name.

In Fig. 58 is shown a plan of these jacks. The measurement line being at the center of the back in each case and show all of them to be for the same length of run, the dotted lines showing the amount of the reduction to be made to fit to their proper place. In this, it will be seen that the cut across the back of the jacks (commonly called side cut) are at an angle of 45 degrees and this remains so regardless of the pitch given the roof. Therefore, the side cut of a jack, in one sense of the word, is a miter just the same as for a square-cornered frame. To prove this, after the side cut has been made for any pitch cut off the peak end of the rafter on a line parallel with the seat cut and it will be seen that the angle is at 45 degrees just the same as shown in the plan. There are several points that we would like to touch upon at this time, but we must close.

In the next number we will dwell more particularly upon steep, or unusual pitches in connection with the steel square.

Cleaning Window Glass

To thoroughly clean window glass pass diluted sulphuric acid, about as strong as vinegar, over it, and let it act a moment; then throw on just enough pulverized whiting to give off a hissing sound, directs the Master Painter. Rub both over the pane with the hand and polish with a dry rag. Rinse with clean water and a little alcohol, polish dry and clean. Treat both sides of the glass in the same way.

Building Construction

J. A. F. CARDIFF

Building a Home

A SERIES OF ILLUSTRATED ARTICLES COVERING CONSTRUCTION DETAILS IN THE ERECTION OF OUR AMERICAN HOMES —FROM THE LAYING OF THE FOUNDATION TO THE DELIVERY OF THE HOUSE TO THE PAINTER

WITH this number, we conclude the study of double hung windows in frame walls; illustrating in Plate 23, a window with inside sliding blinds and in Plate 24, a double hung window in a brick veneer wall.

In Plate 23 we have shown the inside blinds sliding in grooves on the window jambs, and, when not in use, sliding down in a pocket (Fig. 104) behind a moulded panel back. The pocket is covered by a hinged stool "A", which raises up as indicated by the dotted lines when it is desired to use the blinds.

Rather than have the sliding grooves and blinds project in the room, we have made the wall thicker by the use of three by six-inch studs, with the exception of that portion of wall under window frame where we have used two two by four-inch studs. When the wall is not made thick enough to take up the extra thickness of blind box and slides, the whole window is made to project in the room, causing a more or less unsightly appearance. The window frame itself is constructed in pretty much the usual manner, the exceptions being the extra width of window head and pulley stile caused by thickness of wall and the omission of the inside stop beads, in place of which we have the sliding grooves marked "S. G."

The plastering behind the blind box should not be omitted. The scratch and brown coats, however, are sufficient. All spaces around window frame should be well filled up with scratch mortar.

In Plate 24 the wall is constructed of two by four-inch studs, doubled at openings; plastered on the inside; sheathed diagonally on the outside with matched boards; then covered with water-proof sheathing paper; and then with four inches of brickwork. The veneer of brick should be tied to the frame wall every five courses, opposite every stud, with patent veneer ties, shown in Fig. 109. The tie is made of one-eighth-inch galvanized steel wire, and is far superior to the iron nails frequently used.

Brick veneer construction for exterior walls is largely used in many sections of the country, and seems constantly growing in favor.

The window frame is constructed in the usual manner, with a moulded staff bead to cover the joint of brickwork and window frame.

Fig. 106 is a section through the window head. Fig. 107 is a section through the jamb. Fig. 108 is a section through the sill, and shows the wood sill lapping over the stone sill. The stone sill is made the thickness of two courses of brick, four inches longer than the width of brick opening, and six inches deep. It is made with a wash and with lugs at each end, projects one inch beyond the face of the wall, and extends back to the studding, over the sheathing. Fig. 110 is an exterior elevation of the window.

Manufactured Stone

Cement houses are growing increasingly common, and both the soft, wherein the cement is applied to a framework, and that other construction, in which cubes of cement are employed, find favor with architects. Now comes manufactured stone, which is said to be far superior to either form of cement construction.

The factory has been established in British Columbia, but the process is of German origin, and is patented. It consists of mixing sand and quicklime in certain proportions, the dry material being packed into moulds of proper size, in which a vacuum is formed. Water is introduced, and there being no chance for the lime to expand, the bricks are pressed into a proper hardness. They are then subjected to a heat for ten hours, during which time the sand and lime form a chemical combination of hydrosilicate of lime, which is not only exceedingly hard, but practically impervious to water, wherein it possesses a marked advantage over ordinary brick.

"I have done my best" is sometimes only a reflection on our lack of ability to have done better.

The man that is going to do something tomorrow is all right, only he is a day behind time.

Don't be a slave to your work; be master of it.

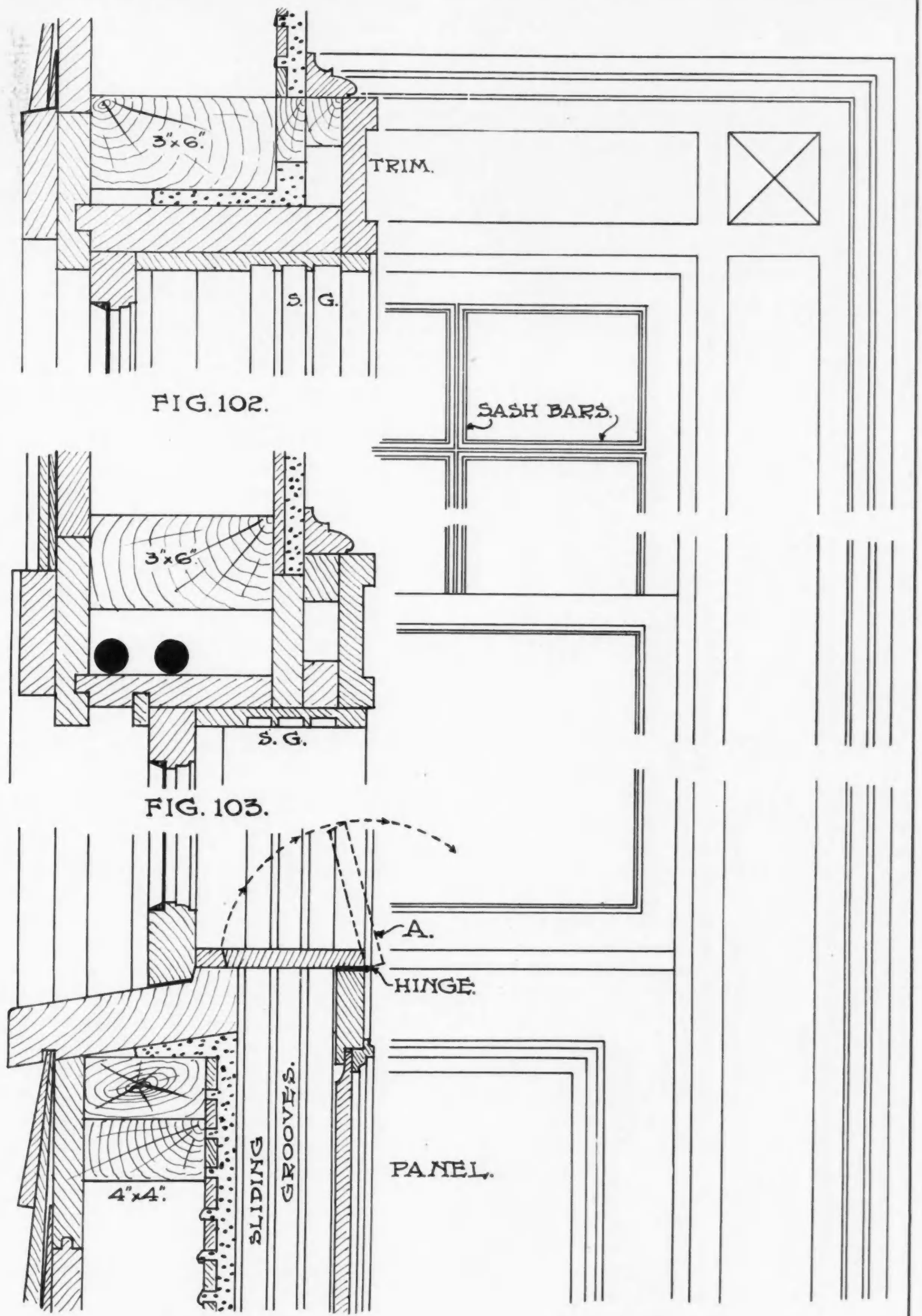


FIG. 102.

FIG. 103.

FIG. 104.

FIG. 105.

PLATE XXIII.

WINDOWS.

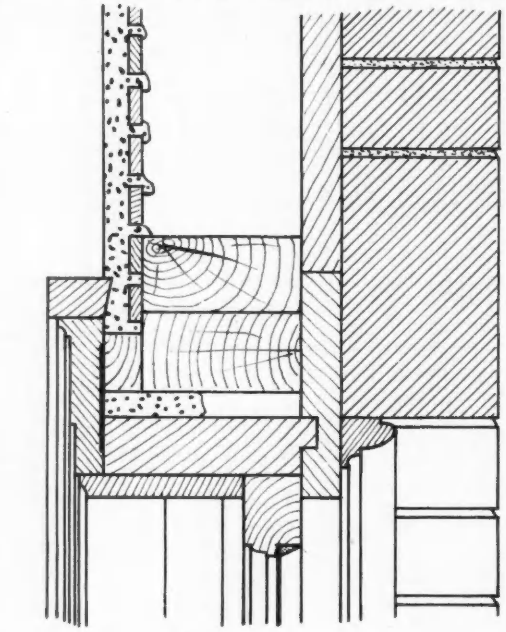


FIG. 106.

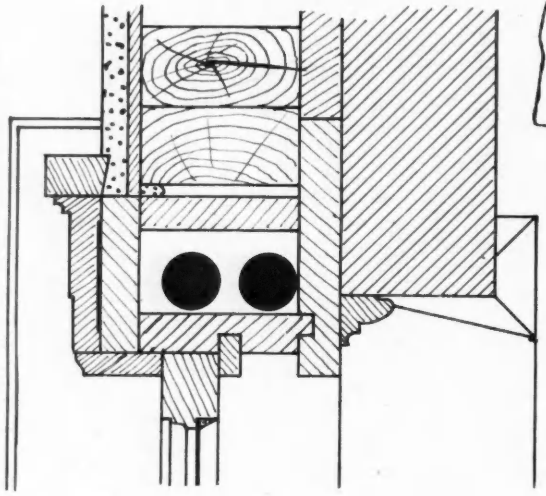


FIG. 107.

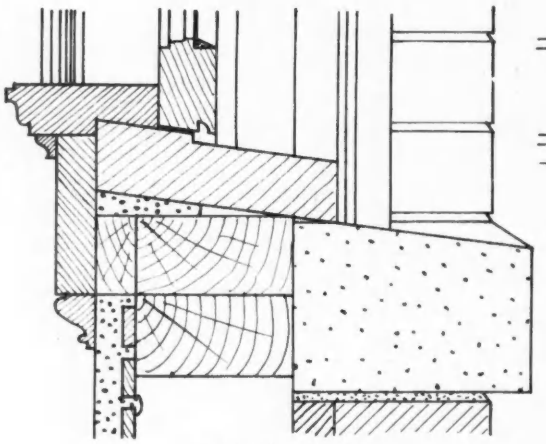


FIG. 108.

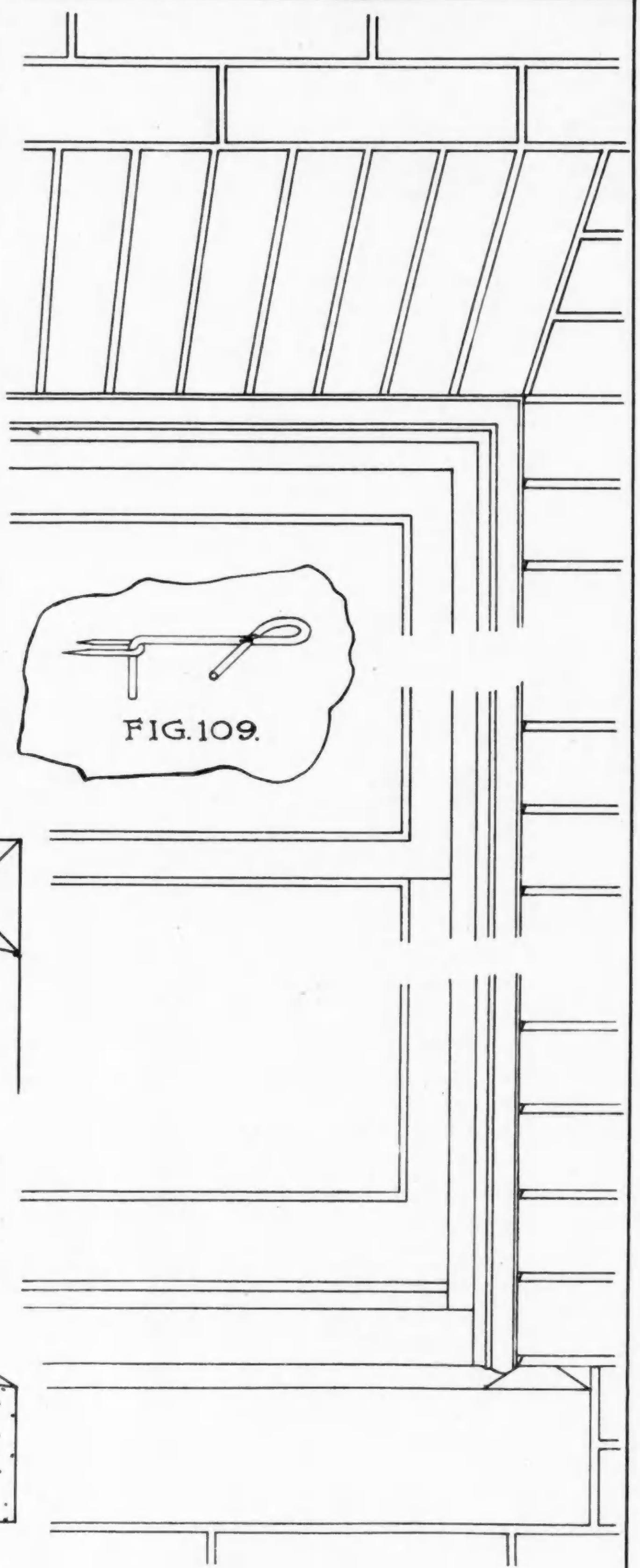


FIG. 109.

FIG. 110.

PLATE XXIV.

WINDOWS.

Hollow Concrete Block Construction

DESCRIBING THE UNIT OF MEASUREMENT SYSTEM, WHEREBY BUILDING WITH CONCRETE BLOCKS IS GREATLY FACILITATED—HOW COST OF BLOCKS CAN BE DECREASED

By Harmon S. Palmer

THE first conception of hollow blocks was one cell, one shape, and one size; given a large number of such blocks and many would suppose the builders could make anything which an architect might call for; that was the idea on which the original building was started. Let us follow and see what troubles are encountered; the mason lays the blocks on a smooth and true foundation, the corner is turned all right, the frames are set as desired and the first course of blocks completed; on turning the corner of the second course a perfect bond is not obtained unless the thickness of wall is just one-half the length of block. This is not so material, but on reaching the frame a closure must be cut, which would not be the case if the bond were perfect; and in cutting hollow blocks many more are shattered and ruined than would be the case if they were solid; besides one end of the block would be open and would not fit the frame; here, then, is the first difficulty in using hollow blocks.

In fitting the angles of bay windows even more difficulties are encountered, and the scrap pile is proportionately increased; a certain number of courses reach beyond the tops of the frames and this causes more waste than angles and closurers. There is difficulty in setting floor joist, but much more is encountered on reaching the cornice which has an ornamental design; should a closure have to be cut in this course in all probability the design would be ruined, but on reaching the top to which the roof must be anchored more difficulties arise, for the block is only a shell, and it will not stand wedges and pounding, although it possesses plenty of crushing strength. Other means must be found to unite the roof with the stone. There are many other surprises to which a builder is subjected before his building is completed, and as he figures the cost at the end is it any wonder that he concludes to follow the old way? How many builders have kept on losing money in these experiments, and where is the man that has even repeated it until within the last dozen years? But, yet, there was a way to overcome all these troublesome points, and perserverance has disclosed the following methods:

Unit of Measurement

The first successful one was to employ a corner block with a return corner, whose length was just one-half of that of the full block. By this means the perfect bond was retained when the corner was turned, no matter what thickness of wall. In addition to this all blocks were made in lengths, the multiple of which would correspond with units of the full block. This principle was to be applied not only to the blocks themselves, but to all other construction, such as doors, windows, chimneys, bay-windows, additions, porches, alcoves, and everything about the building. It will be seen from this that the art consisted in combinations of a standard unit of measurement whose multiple was to be taken throughout the whole plan. With this principle added to an acceptible artificial stone, the next step was rapid manufacture; the machine and sundry processes co-operating in this respect, it only remained to construct it with such subdivisions of units as that adopted in the general plan of the house. With this object in view the first successful machine was built for a unit of four and one-quarter inches, or seven units as a full block of thirty inches. There was no particular reason for this, and experience has proven that units of two inches are preferable, although the other was good, if the same was used throughout the building.

The second method consisted of the same principle, but differs in this respect that instead of the return corner the length of block is governed entirely by the thickness of wall; supposing a wall to be twelve inches in thickness, the length of the blocks must be twenty-four inches, because when a corner is made of two twenty-four-inch blocks, the superincumbent block must be twenty-four inches in length in order to reach the center of the lower block and produce a perfect bond. Now to carry out the principle of units and its multiple the twenty-four-inch block must be divided in halves, quarters and eighths, resulting in lengths of twelve inches, six inches and three inches. Taking these as a basis of measurements the balance of the building consisting of doors, windows, openings, etc., must be upon the same general plan. It would appear that this is just as good as the first method, and accordingly the machine must be made on this basis of subdivisions, but supposing a ten-inch wall is wanted, then, in order to carry out this accepted method, the length of block must be twenty inches, and its subdivisions ten, five and two and one-half inches, which calls for a different unit to be applied to the wood-work, doors, windows, etc. It will be admitted that this is rather impractical. Often the walls of upper stories of a building are not as thick as the lower ones, and therefore the harmony of construction is entirely destroyed and becomes complicated with each succeeding change in

EDITOR'S NOTE.—This is the second of a series of articles by Mr. Palmer, each complete in itself, which will appear from time to time.

thickness of wall, each calling for a machine with units of a different length. There is no way to avoid this without special closures.

We are now to the point where the blocks can be made rapid, durable, and of such dimensions as to do away with the wasteful scrap pile. If the architect has made his plans correct, there can be no failure, no cutting or mistakes. The frames are on the same unit of measurement as the blocks, and when set in the wall displaces the same number of units of stone; when this principle was applied to hollow block construction the effect was like magic, and the results as sure as the multiplication table.

Limited Number of Sizes

Now let us look more closely at these blocks in relation to their adaptability to general building. It is not the largest number of sizes and shapes that should be desired, but the very least number that will enter into the greatest number of combinations (this prevents complications and avoids the necessity of capital in idle stock), the number might be so large as to be a Chinese puzzle to arrange. In this case, however, the proposition is very simple; suppose the unit to be two inches, they would run like this, thirty-two inches as full block of sixteen units, twenty-four inches a three-fourths block or twelve units, sixteen-inch block or four units, four-inch block or two units, which, under most conditions is low enough, and what is the result? So far we have only five stock or standard blocks to which should be added the return corner and the joist block, and the one containing the gains in which the joist rest, which being eight units from centers is correct for lath, and even this makes the number of blocks only seven. This is sufficient to erect any building within reason, and without cutting a single block, and yet setting the frames of any size, and in any possible location, within the limits of two units, and the end of every block fitted to receive the frames.

When the first house was constructed of hollow blocks on this plan, many builders saw its advantages as plain as the blazing sun, its reduced cost was apparent, and sacrificing everything to cheapness, one of the stepping stones was laid. Many who were not builders, seeing the progress of cheap hollow block houses, thought they saw the whole thing and plunged into the business when they should have stuck to their own. I fully realize the universal disapproval to any such theory as this, and can hear disparaging remarks from prominent architects and many builders.

Not long ago my attention was called to a colloquy between an architect and the builders of a house of hollow block, the plans of which had been prepared, but evidently without reference to the above system. The builder sent for the architects, who on arrival asked: "What is the matter?" The builder replied: "Your plans don't work out right," and the architects made the natural response: "Is there anything wrong with the figures?" "No, not that, but we can't make so many lengths of blocks, and the plans are not practical, besides we will have to shift some of the frames to make the proper bond." But because the architect had completed his plans, to his satisfaction, and the owner had accepted them, relying on the supposed superior judgment of the architect, it was but natural that the architect should give the builders the alternative of making a multitude of odd sizes of stone or quit the job. Who paid for the blunders of that architect? Was it his clients, or was it the builders who might have taken the job supposing the plans were right? In this case it is evident that the builders had a better conception of this art of building than the architect, and it might be mentioned here that although the architect is supposed to have superior judgment and ability to plan and see to its execution, the methods of the practical builder are superior in some cases and the advent of the hollow block has given ground for their ideas to take root from which it will gradually expand, until the architect will see the advantage of planning on these lines in order to give to his client the greatest good for the least money.

Cost of Artistic Designs

Now let us consider the reasons for an endless variety of shapes and sizes of stone which makes it necessary to employ blue-prints, templets, etc., and then mark every stone for its particular place in the building. It is plain and imperative when plans are drawn with the only object of carrying out the artistic designs so universally sought at the present time, and for which architects are vieing with each other to excel; although these endeavors are not to be discouraged by any means, as many people have esthetic taste and plenty of means to gratify the same, there are vastly more who would rather dispense with some architectural technicalities and put the money in other places if they could only understand the actual difference between the cost and what they get.

I will take the word of any contractor as to the fact of increased cost, in some cases a hundred per cent, by adding some inconsequential design of curves and circles to satisfy a particular taste, for which the investor must pay builders' prices, and he always knows how to get them in. There is nothing wrong in this in the least, but it develops a condition in which two classes are to be served, and a comparison of the relative cost and benefits should be made by a competent person, and reliable information given to prospective builders, in which case a very large majority would prefer the standard unit building instead of the more costly one. As an illustration look at the enormous quantity of glass which is carried in stock, in many cases varying only an inch in width or length, in order to be on hand at the call of some over-zealous architect or builder; but it is the home builder that pays the interest on stock, insurance, storage, etc., on tones of odd sizes, much of which could be saved if a universal standard of measurement were adhered to throughout the entire building operations. The same holds good with reference to frames, doors, mantels, blinds, windows, closets, etc., but where in all the building trade can we find any of these things whose units of measure correspond to that of the main walls?

Consider what an endless variety of designs are produced by the geometrical divisions and sub-divisions of encaustic tile; also the beautiful effects of terra-cotta, inlaid rubber flooring, etc., all of which are made possible by employing a system, and what a chaotic proposition would be presented without it.

Yet the prevailing method of building is practical, it has long been in vogue, and to a certain extent will always remain; it is only the hollow block that has shown the desirability of standard units in the main walls; but where the old way is to be continued a machine adapted to all adjustments and requirements should be employed to make the blocks, and as many of them are so made at the present time there will be no difficulty in building with them except, as to cost of product, delays in replacing broken stone, rectifying mistakes, carrying special stock, and various other disadvantages which will be taken up in the future.

Work for the Dull Season

THINGS THAT CAN BE MADE DURING ODD HOURS—HOW TO MAKE THE WORK PROFITABLE—USEFUL SUGGESTIONS TO THE CARPENTER

By George H. Melrose

AT about this time of the year the carpenter, the saw-mill man and the cabinet maker find opportunity for considerable additional work during spare hours. I know of a number of men who derive a very good income by putting in an hour or two during the evenings, or dull afternoons, in the making of household articles. There is, for illustration, always a demand for substantial and suitable boxes for house plants. I could tell of several parties who undertook to supply some plant boxes for interior use, and who make several models and placed the same outside their shops for exhibition. It was not long before orders commenced to come in. Very satisfactory prices were secured. Ordinarily the house-plant box is built according to the plan shown in Fig. 1. Simply a plain box set upon unreliable wood supports. Sometimes the woodwork is painted green and this helps a little. But the box does not possess the finish required by the house-wife who likes ornamental articles for her rooms. Therefore this type of boxes is not popular and it would not pay to make them except on orders. But a friend of mine tried another plan in the producing of plant boxes. He realized that there was a chance to dispose of boxes for interior floral decoration, providing that proper models were exhibited to draw the patronage.

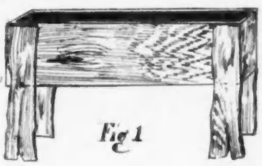


Fig 1

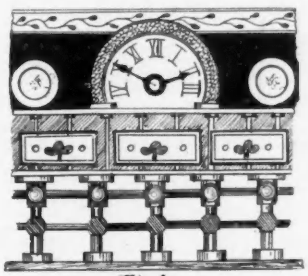


Fig 4

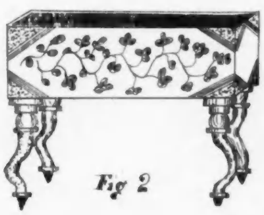


Fig 2

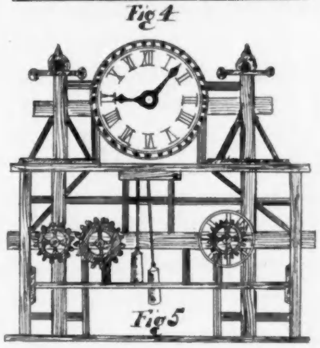


Fig 5

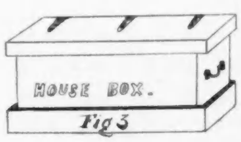


Fig 3

Therefore he made three plant boxes of the order presented in Fig. 2. Practically the same body was used as in the first instance. Common pine stock, cut to right proportions and nailed. Then instead of nailing on four plain pine boards for the supports he turned out some artistically designed legs from hard wood. These legs were secured to the box bottom by mortising and pinning, making a strong union. Then he proceeded to adorn the sides and ends of the box. First some fret-saw work was cut out in representation of the floral figured display and this was glued on. Small wire nails were also driven through to aid in making the connection firm. The base for the fret-saw design work was first painted white on one box, enamelled a whitish gloss on another, and the other was simply varnished. The fret-saw work being of black walnut, the figures stood out well. Next the corner adornments were put on. Pieces of thin walnut were properly shaped and secured with wire nails and glue. The boxes were made at very little increase in cost of manufacture over the plain box exhibited in Fig. 1. In fact, hardly enough difference to amount to anything. But the boxes immediately jumped in value in the estimation of the house-wife. These boxes were seen by people passing by the shop and as the boxes were marked with price, from $1.00 each to $4.00 each, according to size, quite a patronage was built up. There was plenty of spare-hour work for all. Whenever the regular work ran slack, one of the men would even up things by working at the plant boxes. Someone was at this work much of the time but the boxes always sold as fast as made. In fact, had more boxes been made more would have been sold.

Then I hear of another carpenter who secured more business than he could attend to during the busy season, while there were intervals during the year when jobs were extremely few. This man once made what he called a "house-box" for a woman. The woman said she wanted a box for the kitchen in which house tools, tacks, nails, nail-puller, saw, screw-driver, some screws, tin shears, some curtain fixtures, etc., could be kept. My friend made a box of the kind and charged the lady only actual cost of materials. The lady was highly pleased and exhibited the house-box to everyone who called. It was a neat box, made on the plan exhibited in Fig. 3 and of convenient size to lift. My friend determined to make three more of the boxes for parties who called after having seen the box of the lady above mentioned. While making these three boxes orders were received for more. A price was fixed and more boxes made. They went as fast as finished. Finally the boxes were made of hardwood and ornamented with sheet metal corners and brass hinges, and greatly improved over the first pine wood and plain boxes. However, the demand continued for both kinds. My friend turned out many plain boxes of this pattern at $2.00 per box. The better finished boxes were sold at $3.00 to $5.00 each. Soon some of the ornamental boxes were required for keeping plated ware in. There was quite a run for these boxes. My friend told me that he no longer had spare hours and furthermore that he had to use some of his evening hours to fill orders.

I find upon visiting the shops during the dull season that instead of making plain, substantial and practical devices for the home, some men undertake to go into the advanced field of household, hall and library decoration with odd settings of furniture. For example, in one shop I found a man working good and hard on the hall setting presented in Fig. 4. He had tinkered at it during spare hours for a week or more. The article was nearly finished. It presented a hall device with three drawers, a shelf arrangement on which some ornamental plates could be placed and a part of a clock. The affair possesses certain striking characteristics. It is just the kind to appeal to some of the antique furniture buyers. The clock was not intended to run. Simply an ornament, made by buying up a face of a clock at a second-hand dealer's and adjusting it in the wood frame as shown. The trouble is that it is necessary to wait for a customer on work of this kind and it is very difficult to design on an order. I find divers selections of oddities of this nature put aside in the shops.

This one required many hours to make and quite a good deal of valuable lumber was used. Another kind of article is shown in Fig. 5. This consists of a running hall clock, with some heavy-like wood and metal gearing pinned to the frame work, while the frame itself is mostly plain stock. This was made during odd hours. Chiefly pieces of lumber were used from about the waste pile of the shop. The gears were picked up at random, painted black and put on for show purposes. The clock was bought at a clockmaker's and put into place. The pipe wood frame was touched up to obtain a representation of antique lumber in a dark hall, and really the outfit was pleasing. It sold quickly and at a good price and another is to be made at once. When you make these things you cannot expect a sale if you store the article away. Better put it out where it will be seen. Make a price and mark it accordingly. It is a good idea to advertise that you have these articles on hand and you are ready to make them according to order.

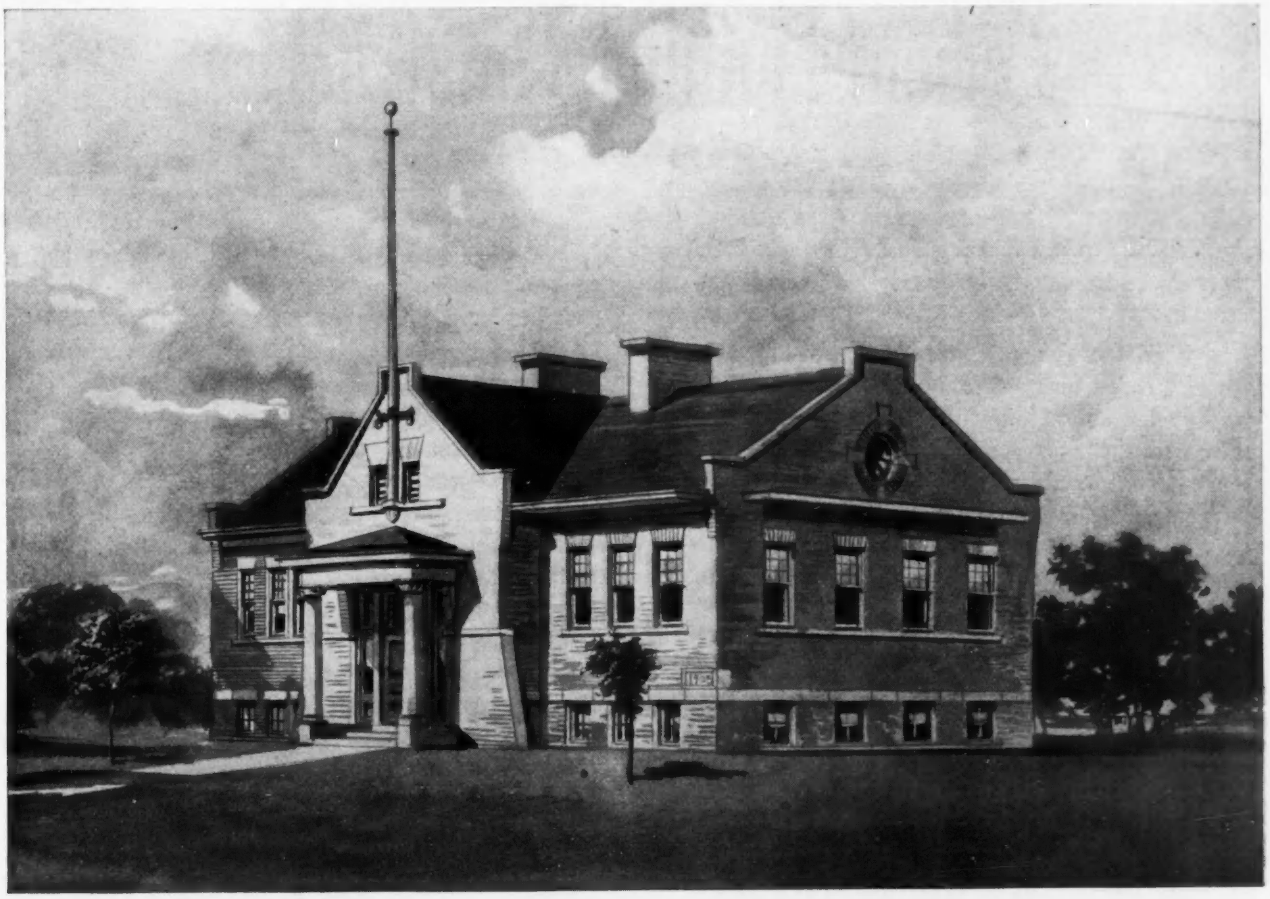
A Two-Room School

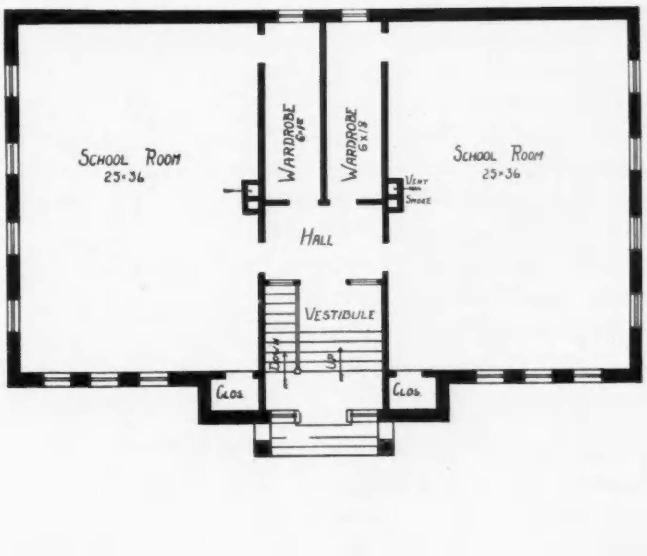
PERSPECTIVE SHOWING THE BUILDING AS IT WILL APPEAR WHEN FINISHED—FLOOR PLANS SHOWING INTERIOR ARRANGEMENT—DESIRABLE FEATURES OF THE BUILDING

WE are, this month, illustrating the perspective and floor plans of a two-room school. This size school is very desirable in many of the smaller towns where a large school is unnecessary, but where a neat, attractive building is desired. The style of architecture is that known as the Colonial style, and gives an artistic touch to the building without increasing the cost. The entire building is of brick, and the roof of slate. In erecting a schoolhouse it is much more beneficial to the entire community, and the children especially, to have an inviting looking structure, one that can be pointed to with pride and to which it is a pleasure to go.

The interior arrangement is as practical as can be had. The two main rooms, which are twenty-three by thirty-six feet, are on either side of the main hall. Windows are on two sides of each room, making them light and cheerful. On the other two sides is wall space for blackboards. The wardrobes are located in the main hall, and are so arranged that the students can march through them and leave their wraps in an orderly manner. The entrance is protected, and this is very important in cold and stormy weather, as it prevents an icy stairway, and also drafts in the main hall. The basement extends under the entire building, and is well equipped. It has a furance room, fuel room, boys' and girls' playrooms and toilet rooms.

Despair never yet got a man an increase in wages, nor lightened the burden of his work.




School Room
25×36
Wardrobe
6×18
Wardrobe
6×18
School Room
25×36
Vent
Smoke
Hall
Vestibule
Down
Clos.
Clos.

Cement Building Construction

FRED W. HAGLOCH

Practical Fire Test of Building Materials

DESCRIBING THE EFFECT OF FIRE ON THE VARIOUS BUILDING MATERIALS – CONCETE BLOCKS THE BEST RESISTANT – EFFECT OF FIRE ON BLOCKS MADE OF DIFFERENT MATERIALS

RECENTLY a fire of four hours' duration destroyed nearly $300,000 worth of buildings at Cleveland, Ohio, in a locality where I was familiar with the construction of the buildings. Being on the scene from the start, it afforded me the opportunity of learning the fire resisting qualities of the various materials contained in the buildings, such as clay-brick, natural stone, concrete and hollow concrete blocks. That the reader may in a measure realize the intensity of the heat, I need but recite the fact that a two-story frame dwelling 28 by 34 feet, was entirely consumed in one hour and twenty minutes, yet during this time a stream of water from a four-inch hose was constantly pouring on the flames, which clearly proves that the twelve fire departments would not have confined the fire to a limited space had not fire resisting material assisted in making a marked boundary line for the destroyed section.

The fire originated on the fifth floor of a six-story knitting mill which was constructed of 12-inch brick walls with eight-inch pilasters about every fourteen feet and heavy pine interior construction. In less than half an hour from the time of the first spark this building was a seething furnace from basement to the roof. It was bounded on three sides by 60-foot streets and on the fourth (west) side was separated from four frame dwellings by a 12-inch wall with few openings, yet with the wind in favor of those dwellings, they were destroyed. The wind being northwest drove the flames to the south and east in the beginning, but soon bore almost due south.

On the east three frame dwellings and one five-suite brick tenement building was almost entirely destroyed. Directly on the south was the brunt of the battle and it was here that four frame dwellings were consumed in a very brief space of time, one of which, together with a one-story brick store, stood between the fire and a two-story concrete block building which was not yet completed. The concrete block building is 54 by 54 feet, and 20 feet high, containing three store rooms (the one nearest the fire being occupied by a grocery) and living apartments on the second floor. The walls are eight inches thick and four styles of blocks were used. The original plans had but two windows on the north (fire side) with automatic closing fire shutters, but the new building code forbade it and a light court twelve feet wide on the second floor was built in its stead. It was this apparent fire protection that proved a detriment by allowing the flames to enter the second floor of the building, yet the eight-inch hollow block wall remained intact although the flames swept over this building and partly de-

Cement Building Blocks After a Four-Hours' Fire stroyed a frame building beyond. The concrete building proved to be a place of safety for the firemen and buildings south of it were protected by streams of water pouring from this building, at all times during the fire the second floor of this building was occupied by the firemen protecting surrounding property.

The illustration is a rear view of the concrete building, the corner of the building in the center of the illustration being the portion that withstood the brunt of the fire, the opening on the second story on the left being the light court on the north side, and the opening on the right being the rear entrance to the apartments, the photograph being taken after considerabde glass had been replaced, as all glass had been destroyed. On the entire north side and on the first story of the rear, rock face blocks were used, but on the second story of the rear wall plain blocks were used.

All buildings on the north and northwest were entirely destroyed for a distance of 250 feet, and the adjoining frame building was separated from the concrete block building by an open space 18 inches wide. This space could not be utilized by the firemen.

The fact that 8 and 12-inch brick walls were no barrier and that an 8-inch hollow concrete block wall built during the winter months proved a complete blockade for the flames is remarkable.

Since the destruction I have carefully examined the remains of every building and give the following items of interest to the builders.

Clay brick were all partly injured, as the corners of many have crumbled away.

Brick walls laid in lime mortar fell before the fire ceased, even though some were twelve inches thick and not over 22 feet high.

Twelve-inch brick walls laid with cement mortar stood reasonably well to a height of 25 feet; many bricks have cracked and the cement has released its adhesiveness to them, so that it will necessitate relaying.

Natural sand stone broke into small spalds and few pieces remain that weigh over one hundred pounds though the original sizes were from one to eleven cubic feet each.

Lime mortar was reduced to a grayish powder; cement mortar burnt brown and after a few days' exposure to the air became brittle.

Cement walks made of ordinary Portland cement were discolored to the depth of half an inch, and many cracks or breaks caused by the sudden expansion are apparent. Sand stone sidewalks two inches thick were rendered worthless, while those four inches thick are practically uninjured.

Concrete block walls being the only material that remained intact, it must be remembered that it did not escape without injury, the entire exposed surface being discolored and is now of a brownish cast which originally was a grayish blue and all discolored portions are brittle (charred), so that in some places small spalds can be removed easily, while at other places some blocks have cracks penetrating through the wall; but these are confined to four blocks, each having long hollow spaces. The small core and spool blocks are entirely free from cracks on the interior side, and none have been found on the exterior that penetrate to the hollow spaces within the wall. As this building was erected during the midwinter months, some mortar joints became frozen before fully hardened, which were expanded and cracked by the heat, but all mortar that had become hard before freezing remains uninjured. This building was constructed of blocks gathered from various concrete plants over the city, and it affords us a study of materials, viz.: blocks made of Portland cement, fine crushed sand and bank gravel proved the most durable.

Blocks made of Portland cement, course bank sand and gravel ranked second, and blocks made of Portland cement, unclean bank sand and gravel mixed were the poorest.

One very interesting feature is the fact that some concrete, after being charred, will again become hard by keeping moist for several days, while others will not; why this difference I am at present unable to answer, but am making a series of tests that will determine same.

Terra cotta was not injured by the heat, but being used as trimmings, the opportunity for severely testing its heat resisting qualities were limited.

Steel, as usual, during the fire warped so as to render it worthless.

Several openings closed with wood which had been treated with chemicals for fireproofing two years ago were pierced by the flames as readily as though dry pine boards had been used.

Composition roofs were all destroyed.

Hollow concrete block walls have proved that a seething furnace may be burning on one side and have little effect on the temperature on the other. This feature has inspired a glass manufacturer to build a glass melting tank of concrete, which heretofore have been constructed of high grade fire clay. While I am a strong advocate of concrete, my past experience in glass tank construction does not approve this step, although it is known that good concrete is superior to poor fire clay brick for furnace purposes.

Cleaning Mortar Stains from Brickwork

To the Editor: Farmington, Iowa.

Kindly give me the best method of removing mortar stains from brickwork. ALVA HUNT.

Answer: Muriatic acid diluted with water is generally used for removing mortar stains from clay brick. It is applied with a sponge or flannel cloth and then washed with clean water and a scrub brush. Should this fail take two ounces muriatic acid, two ounces oxalic acid; mix with one gallon lime paste to the consistency of paint and apply with a brush.

Remove in from six to twenty-four hours with cold water, as the acid would in time injure the brick and mortar.

Building a Cistern

To the Editor: Tarboro, N. C.

Will you please furnish me with information as to how to build a cistern? Will a wall four inches thick, of hard brick and well plastered, be watertight and keep surface water out? D. D. WAGNER.

Answer: The four-inch brick wall laid in a cement mortar (one part cement and two parts sand) and plastered on the inside a half-inch thick, with the same mortar, is in ordinary cases satisfactory. But to make it absolutely watertight let the wall become hard, which requires six or eight days, then dry with a light fire and coat the interior surface with a solution of one pound castile soap to five gallons of water, applied hot. When dry (twenty-four hours) cover with a solution of one-half pound alum to three gallons of water, apply lukewarm. Both solutions can be applied with a paint or whitewash brush.

Cause of Efflorescence

To the Editor: Glenville, Ohio.

What is the cause of a white or grayish efflorescence gathering on cement blocks? Can they be made so they will be free from this, and how? O. J. LEACH.

Answer: Efflorescence gathers on stone, brick or terra cotta and commonly speaking, "it resembles mildew." It is caused by the lime in the cement or mortar coming in contact with water (moisture) and sunlight or heat. It is found on natural stone, but more so on concrete. No one formula will remove it in every instance, but a wash of muriatic acid solution (one part acid to forty parts water) will often remove it. It can be prevented by waterproofing the exterior surface of the wall after the mortar has hardened.

Concrete for Fireplace

To the Editor: Coquille, Ore.

Will you please tell me as to the advisability of using good concrete to construct a fireplace? Will the concrete stand the heat without crumbling? NED C. KELLEY.

Answer: A fireplace built two years ago of hollow concrete blocks has stood the heat without a crack, but has badly discolored, becoming brown, which is no doubt due to the clay contained in the bank sand of which the blocks were made. Another fireplace built last year, and in constant use this winter, is in every way as good as when first built. Several instances have proved failures, which I have carefully examined and found due to either a very poor (low) burned cement, or too porous a concrete (lack of cement and fine sand). Blocks made in the following proportions will prove satisfactory for fireplace and chimney construction. One part Portland cement burned at nine hundred degrees or over, one part fine sand, three parts coarse sand; blocks must be well tamped and kept moist for a week. After work is laid cover all surfaces exposed to the fire with a solution of one-half pound soap, one pound slacked lime to one gallon of water, applied with a flat brush. This will fill the pores and prevent discoloration.

Immersing Cement Blocks

To the Editor: Cummings, Iowa.

Would cement blocks made by the dry tamping process, and immersed in water as soon as they were sufficiently set, cure as quickly and be as durable as by sprinkling? J. J. OLIVER.

Answer: Cement while setting is injured by sudden changes, in dampness, temperature or air drafts, therefore to dip a newly made block into water is injurious. Mix your concrete and sprinkle water on the dry composition, and keep sprinkling for six or eight days after having molded, and avoid all sudden changes.

Another Large Saw Mill for Tacoma

Mr. L. T. Dempsey, of the Dempsey Lumber Company, of Manistee, Mich., has placed an order with the Allis-Chalmers Company, through its Seattle office, for one of the largest and most complete saw-mill outfits ever sent to the Pacific Coast. The mill will be erected at Tacoma, where they have secured about fifty acres for the mill site, located on tidewater. The machinery in this mill will be of the heaviest type that ever has been built. It will include an 11-foot band mill carrying band saws 18 inches wide, and a 9-foot band mill carrying double-cut saws 18 inches wide, with a complete equipment of log deck machinery, Pacific Coast carriages, etc., for handling logs up to 10 feet in diameter and 120 feet long. The edger is capable of handling 10-inch timber, and is 84 inches wide. The slashers and trimmers will take lumber up to 50 feet in length. The mill building will be 66 feet wide and about 500 feet long. The power plant will consist of eight 72-inch by 18-feet high-pressure boilers with Dutch oven settings, connected to a concrete stack 100 inches in diameter and 120 feet high. A twin Reliance engine will be furnished, having cylinders 26 inches in diameter by 36 inches stroke. The wheel on this engine will be 16 feet in diameter and 90 inches face carrying a belt 88 inches wide. The electric plant will be driven by separate engines, which will generate electric current for lighting purposes as well as running the planing mill, where each machine will be driven by a separate motor. The dry kilns will be constructed of concrete blocks, making them fireproof. The lumber from the mills will be handled by the improved method, and when completed will be one of the finest plants ever constructed on the Pacific Coast.

A Pleased Subscriber

I am more than pleased with your magazine as the first issue I received was alone worth five years' subscription to me.—NED C. KELLEY, Coquille, Ore.

Short Talks With Our Subscribers

HAVE you noticed how the AMERICAN CARPENTER AND BUILDER has improved each month during the past year? You told us (that is, many of you did) that the first number was the best trade paper you had ever seen, and that it would be impossible to make it better. Yet we did, didn't we? And we are going to keep right on making it better every month.

This number completes its first year, and as every one of our great family of subscribers knows, it has been a year of remarkable growth. This great family of subscribers is now comprised of 27,500 members, and new ones are being added daily.

Starting with 64 pages and cover last April, the magazine increased in size month by month until it is now almost double the size of the first issue, this number consisting of 104 pages and cover.

The first issue had but 5 pages of advertising—this has 60.

Notwithstanding this marvelous increase in advertising, the number and quality of the reading pages has not been sacrificed. This issue contains more reading matter than the first issue, and the editors are vieing with each other in making their respective departments brighter, more attractive and more practical each month.

Bind Your Own Magazines

You may wish your magazines bound, so that you can keep your file in perfect condition. Anticipating your wishes, we have had made to our special order several thousand durable and attractive binders, and owing to the large quantity ordered will be able to furnish them to our great family of readers at 50 cents each, postpaid. The most inexpensive binder you could secure from the manufacturer direct would cost you $1.00 each.

These special binders have cloth sides and back and are stamped in gold letters, "American Carpenter and Builder, Vol. I." You can do the binding yourself very easily (complete directions are furnished with each binder), and when preserved in this manner "Volume I" will make a valuable addition to your library, becoming more and more valuable as its age increases.

Our Great Anniversary Number

Say, we want to tell you that April number of ours is going to be a winner, and you must not fail to get it. We are going to have a specially designed cover for this issue, and when we say this you know that it means that it will be the best there is to be had anywhere.

The contents won't be outdone by the cover, either. You may be sure of that. Mr. Ralph Wilder is going to draw a cartoon which will be appropriate to the occasion. He says he will have a picture, according to his own conception, of our "Great Family" of readers. Possibly you may recognize yourself in this great crowd of nearly 28,000—don't fail to look it over carefully.

The editors of the various departments have all prepared special articles, all practical, wide-awake and right to the point, and all fully illustrated.

The April issue is going to be a dandy, and no mistake. You may think this is good—but wait until you see what we have in store for you next month.

Thirty Thousand Subscribers

We also want to tell you about that 30,000. Not that we have them, but we will have—and we never made a promise that was not kept, did we? We've got nearly 28,000 now, and that means that if every one of you, instead of letting your fellow carpenter walk off with your copy of the AMERICAN CARPENTER AND BUILDER, would get him to subscribe, why, we would have not only our 30,000 subscribers, but you could enjoy your magazine in peace, and your fellow carpenters would be thankful that you had brought them into the great family.

You know how you would feel if you were not in on it, and the other fellow is just the same and appreciates a good thing, so help him by getting him to subscribe, and in that way help us increase the large family.

Your Suggestions Are Appreciated

Right here we want to add that a number of you are going at it in the right spirit by offering suggestions to make the magazine broader and better. If you don't agree with any of the writers, tell us about it and we will be pleased to publish your ideas on the subject. You know there is no better way to get at the bottom of anything than to take it up and discuss it, and that is what we want you to do in our magazine—yours and ours—that's what it's for. So why not use the privilege and get acquainted with the different members of the family?

We are going to devote more space to our correspondence department hereafter, and we are pleased to note that more of you are becoming interested. The exchange of opinions in this department is the most practical information for the carpenter and builder, and we want every member of our great family of readers to take part and profit thereby.

You have received great benefits the past year—we know you have, for thousands of you have taken the trouble to write and tell us so. You will receive greater benefits the coming year. Why? Because we are better acquainted; we know what you want; we know what you need; and we are going to see that you get it, no matter what the cost.

Practical Carpentry

Geometrical Handrailing

HOW TO FIND THE BEVELS TO SQUARE THE WREATH UNDER ALL CONDITIONS—ILLUSTRATIONS GIVEN TO DEMONSTRATE THE VARIOUS METHODS

By Morris Williams

THE greatest difficulty that stairbuilders encounter is that of finding the bevels to square the wreaths.

The accompanying illustrations exemplify a method that to my knowledge was never before in print and undoubtedly it is the most simple method that can be

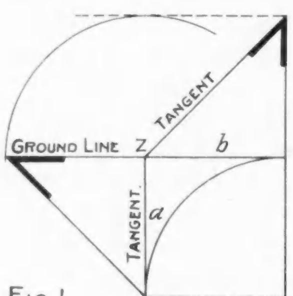


FIG. 1.

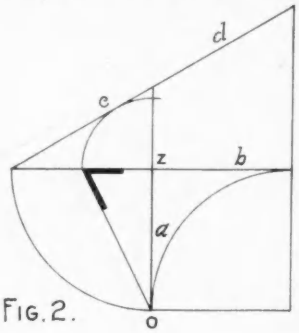


FIG. 2.

conceived to find the bevels under all of the very many tangential conditions that wreaths may assume.

In Fig. 1 is shown the most simple development of tangents where the pitch-board gives the bevel.

In this instance the bottom tangent is level; and the upper one inclines equal to the pitch of the flight adjoining; and as shown in the diagram the bevel is found in the upper angles of the inclined tangent; which in this case coincides with the angle found in the upper corner of the pitch-board, where the riser intersect the long edge forming the pitch.

It will be observed that the bevel in this case, as

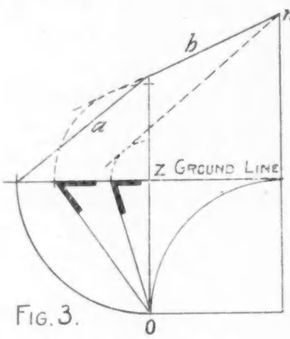


FIG. 3.

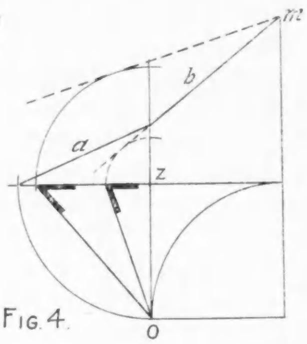


FIG. 4.

shown in the diagram, is of the same nature as that of the top bevel for a common rafter.

If we conceive of a plank being placed on the slope of a roof, and that it is necessary to have its sides vertical when in such position it is evident that the bevel shown in this figure applied to the face of the plank would accomplish the purpose. This is the principle of bevels in handrail construction.

In roofs to find the bevel is a very simple matter; but in handrailing, owing to the variation of the planes the wreath has to rest upon, in its ascend over the cylinder; to find them under all possible conditions is beyond the capacity of but very few; in that it calls for a considerable amount of knowledge in solid geometry.

The method presented in this article will be found to be simple and universal in its application.

Reverting to Fig. 1, which is as already stated, the most simple of any in wreath construction to find the bevel: We place one leg of the compasses in Z; extend the other to touch a line drawn from the highest

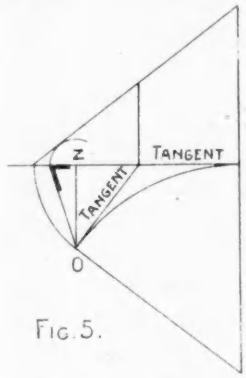


FIG. 5.

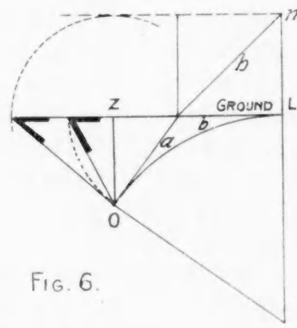


FIG. 6.

point of the pitch, and turn over to the ground line; then connect this point with O as shown.

The nature of the tangents in this figure corresponds with those we meet in level landing stairs, where the crown tangent is level and the other inclined and also on landings where a small cylinder is fixed at the top or bottom of a flight.

In Fig. 2 is presented an example where the two tangents are equally inclined. To find the bevel we proceed precisely the same as in Fig. 1 by placing the compasses in Z, extending it to touch the pitch of tangents, and turn over to the ground line as shown; then connect this point with O.

Owing to the tangents being equally inclined this one bevel is all that is required, but as the two are inclining it has to be applied to both ends of the wreath.

In Fig. 3 we have a case of two unequal tangents, the upper tangent *b* inclining less than the bottom tangent *a*.

In this case also we proceed to find the bevels by placing one leg of the compasses in Z and extending the other to touch the two tangents for the two bevels which will be required in this case owing to the tangents being unequal.

For the top tangent *b*, the arc shown touches the prolongation of the tangent and is turned to the ground line and a line is drawn from this point to *o* forming the bevel as shown.

To find the bevel for the bottom tangent *a*; we draw a line from *m* parallel to the bottom tangent, and

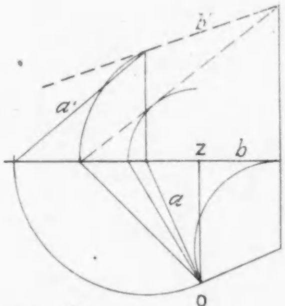


Fig. 7.

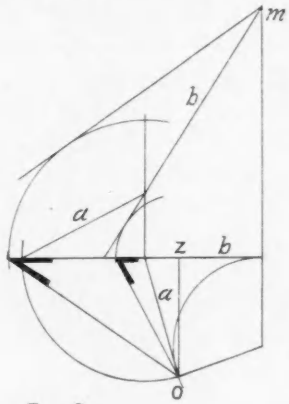


Fig. 8.

as before, place one leg of the compasses in Z, extending the others to touch the line from *m*, and turn over to the ground line; a line drawn to *o* from this point will determine the bevel for the bottom tangent as shown.

In Fig. 4 the inclination of the tangents are reversed; the upper one *b* being considerably more inclined than the bottom one *a*.

To find the two bevels we place the compasses as before in Z and for the bevel that is to be applied to the upper tangent we extend the other leg to touch the dotted continuation of the upper tangent as shown and turn over to the ground line; connecting this point with *o* gives the bevel for the upper tangent.

To find the bevel for the bottom tangent a dotted line is drawn from *m* parallel to the bottom tangent and the compasses placed in Z and the other leg extended to touch the line drawn from *m* turning over to the ground line connecting this point with *o* gives the bevel as shown for the bottom tangent.

It will be observed that all these figures belong to a class of cylinders with plain tangents standing at right angle to one another and that they represent all the variety of tangential conditions that belong to this class.

In Fig. 5 is shown a case where the plain tangents form an acute angle with one another and an equal pitch over the two tangents. In this case we need only one bevel owing to the tangents being of the same inclination and as in all the other figures it is found by placing the compasses in Z extending it to touch the tangent and turning over to the ground line; connecting this point with *o* will determine the bevel; which is to be applied to each end of the wreath.

In Fig. 6 the same plan of tangents is shown as in Fig. 5, but in this case the bottom tangent *a* will be level, and the upper tangent *b* will incline a similar condition as is shown in Fig. 1. To find the bevel for the inclined tangent *b* we place one leg of the compasses in Z, extend to touch the continuation of it as shown by the arc, and turn over to the ground line. The bevel is formed at the angle made by a line drawn from this point to *o* and the ground line as shown.

To find the bevel for the level bottom tangent *a* we draw a level line from *m* and as in all examples the compasses is placed in Z, extended to touch the level line drawn from *m* as shown by the arc and turn over to the ground line. This point connected to *o* will give the bevel for the bottom tangent.

The condition of tangents as exemplified in this figure is met in stairways where a stringer is curved at the bottom; and the rail rampt to intersect the newel.

In Fig. 7 is shown an example where the plan tangents form an acute angle with one another; and the central line of the plan rail more than a quadrant. The pitch over the tangent *b* being less inclined than the pitch over the bottom tangent *a*.

To find the bevel place the compasses in Z, extend to touch the tangent *b* as shown by the arc; turn over to the ground line, and connect the point found with *o*.

To find the bevel for the bottom tangent *a;* draw a line from *m* parallel to it; and extend the compasses from Z to touch this line turn over as shown to the ground line, and connect with *o*.

We have the same plan in Fig. 8, but the pitch over the tangents are reversed. The pitch over the tangent *b* is shown to be much steeper than that over the bottom tangent *a*. By placing the compasses in Z and extending it to touch the tangent *b* continued, as shown by the arc, and turning over to the ground line, we will find the bevel for tangent *b*. Again by placing the compasses in Z, and extending it to touch the line drawn from *m* as shown by the arc we find the bevel that is to be applied to the bottom tangent *a*.

All stairbuilders that read this article will know that the examples it contains cover almost all stairs that may possibly be met in practice, and that the method presented to find the bevels is beyond the least doubt the most simple that may be conceived.

A careful study of which will enable any one to master what is considered the most intricate problem in handrail construction.

Speaking of why work is slighted, sometimes it is pure, unadulterated laziness.

Residences

Four Desirable Houses

PLANS AND PERSPECTIVES OF HOUSES PRESENTING INSTRUCTIVE FEATURES TO THE CARPENTERS AND BUILDERS—SPECIAL FEATURES IN EACH HOUSE DESCRIBED

THE design on page 949 is that of a seven-room house and presents a very pleasing appearance. There is a basement under the entire house and contains a furnace room, store-room and fuel room. The first floor is divided into the parlor, dining room and kitchen. Some of the fine features about this floor are the large hall with its window seat and the fire-place in the dining room. The parlor is 15 by 15½ feet and is well lighted, having four windows. The second floor is divided into four bedrooms and the bath room. The bed-rooms are well supplied with clothes closets and all open directly into the hall. The house has a gambrel roof, which gives the opportunity of having full height ceilings on the second floor.

Seven-Room House

The seven-room house shown on page 948 has many desirable features which are worthy of comment. The first floor is divided into the living room, dining-room, library and kitchen. The library can also be used for a den, as it is an excellent room to pass the leisure hours. There is ample wall space in the library for book cases and it is easily approached as it is between the living room and the dining room. There is a vestibule at the rear of the house where the ice box can be placed. This is a good feature as it does away with the dirt and water which naturally comes with the bringing of the ice in the kitchen. The second floor is divided into three bed rooms and the bath room. The bed rooms are well supplied with clothes closets, and there is a storage room at the rear of the house, which is 5 by 13½ feet.

A Well Designed House

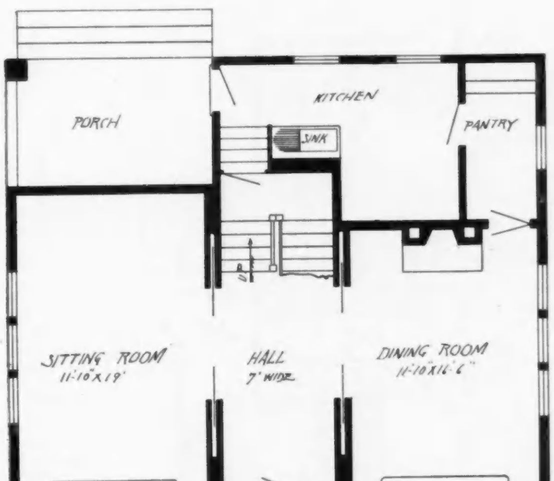
The house on page 947 was designed and constructed by Ernest Meister, Vincennes, Ind. The house is constructed of concrete blocks up to the eaves, above that it is shingle. It presents a very fine appearance, as the concrete pillars across the front make it look very imposing. The large covered veranda which extends across the entire front of the house is another splendid feature and is especially useful during the hot weather. The interior arrangements is as commendable as the general appearance of the outside. The large hall in the center of the house divides the sitting room and the dining room. The dining room has a large open fireplace which is something to be desired in every house. The pantry is conveniently located between the kitchen and the dining room. There is also a good size porch at the rear of the house, which leads off from the kitchen. At the end of the main hall is a stairway which leads to the second floor. The second floor is divided into two bed rooms and the bath room. Each bed room has a large clothes closet and the hall is large and spacious. At the front of the hall is a doorway which leads to a small balcony at the front of the house. The total cost of this neat design was $1,200.

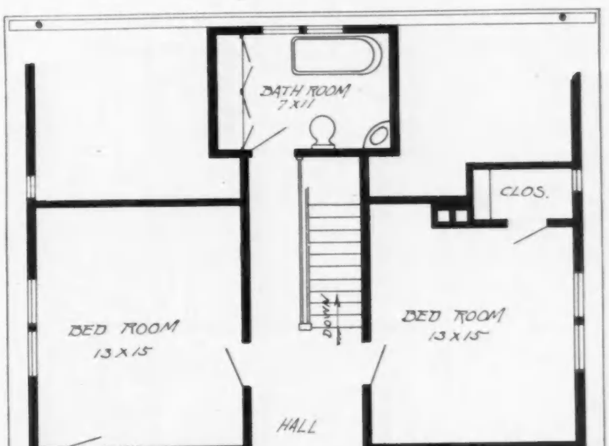
An Artistic House

On page 950 we illustrate the house which was designed and constructed by Geo. Issenhuth and presents many desirable features to the builder. The entire interior finish of the first floor is in southern pine with curly yellow pine panels. The windows are all plate glass and the wood work has an oil finish. There is a cellar in the rear half of the house which is used for a storage and furnace room. The house is located on a corner lot and the sidewalks surrounding it are all of cement. The cost of this house exclusively of heating and plumbing was $3,200.

A Building Entirely Without Wood

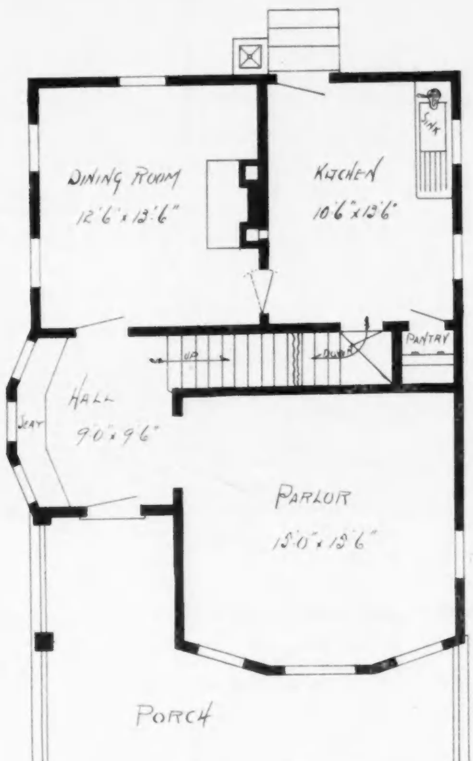
There is at present nearing completion in the city of Bridgeport, Conn., a building which is unique in the fact that it contains no wood whatever and which will be when finished as nearly fireproof as it is possible to make it. It is constructed on the cantilever plan and is supported by foundations of great strength. The walls are of concrete, the floors are of a composition which is fireproof, and the doors, window sills and frames are of metal. The staircases are of the winding type and are made of concrete. The structure is attracting much attention on the part of engineers and insurance men by reason of the fact that the building will be absolutely devoid of wood and that every feature of construction has proved its value, there being no methods employed that are experimental.

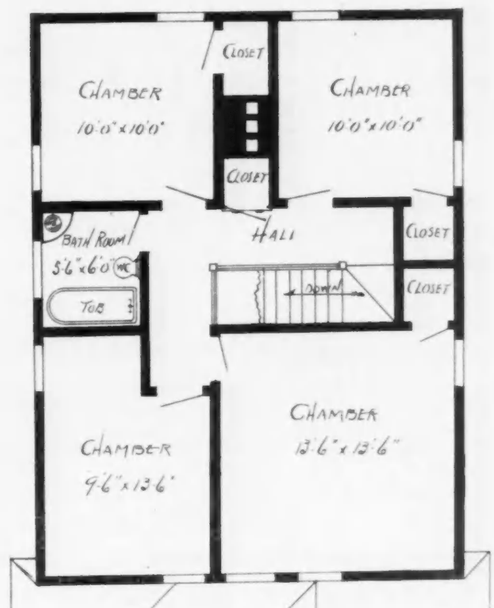

PORCH
KITCHEN
SINK
PANTRY
UP
SITTING ROOM
11'-10" X 19'
HALL
7' WIDE
DINING ROOM
11'-10"X 12'-6"
VERANDA

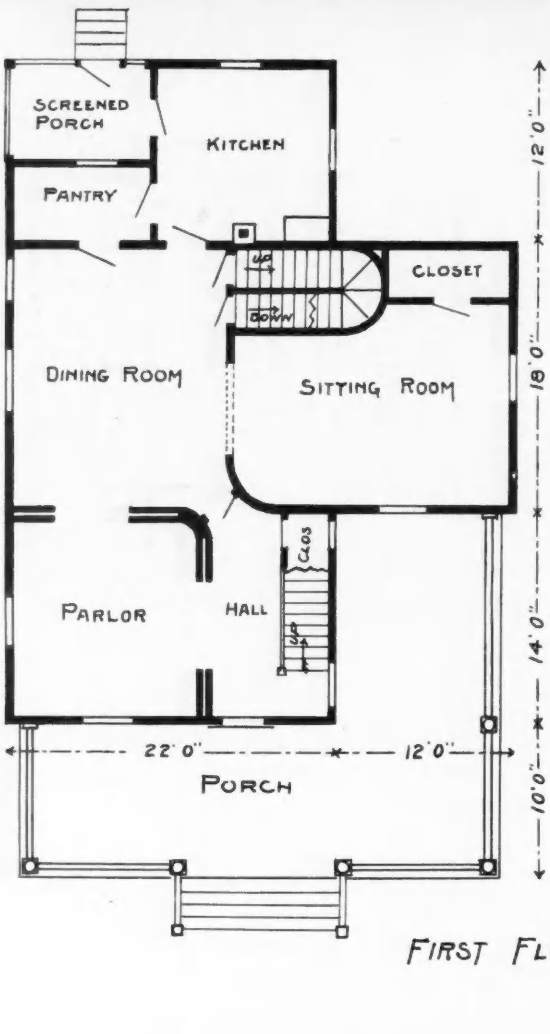

BATH ROOM
7 X 11
CLOS.
DOWN
BED ROOM
13 X 15
BED ROOM
13 X 15
HALL
CLOSET
BALCONY

FIRST FLOOR

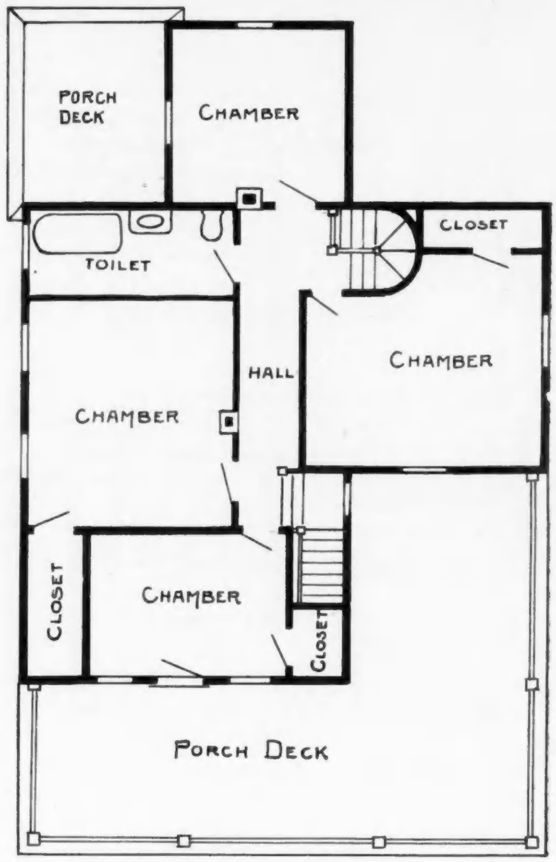
SECOND FLOOR


DINING ROOM
12'6" x 13'6"
KITCHEN
10'6" x 13'6"
SINK
PANTRY
UP
DOWN
HALL
9'0" x 9'6"
SEAT
PARLOR
15'0" x 13'6"
PORCH


CHAMBER
10'0" x 10'0"
CLOSET
CHAMBER
10'0" x 10'0"
CLOSET
BATH ROOM
5'6" x 6'0"
WC
TUB
HALL
CLOSET
DOWN
CLOSET
CHAMBER
9'6" x 13'6"
CHAMBER
13'6" x 13'6"
ROOF



FIRST FLOOR.



SECOND FLOOR.

Farm Buildings

HENRY H. NIEMANN

Manual Training on the Farm

SHOWING DESIGN OF BUILDING DEVOTED TO THIS STUDY—VARIOUS NECESSARY THING ABOUT THE FARM ARE HERE MADE—VALUE OF SAME TO MAKE EQUIPMENT COMPLETE

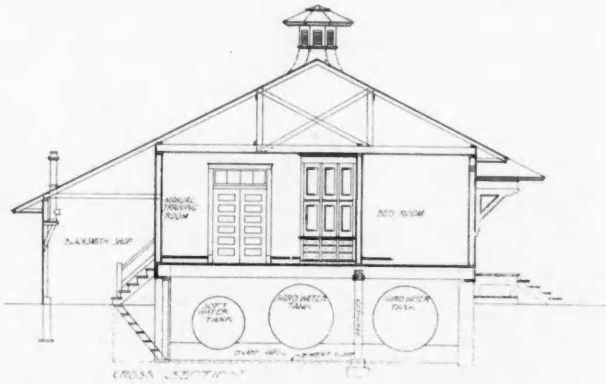
MANUAL training is learning a thing by doing it. The teaching of manual training does not necessarily mean that every student should become a mechanic, but it is founded on the principle of truth, and truth is taught in a more direct and forceful manner by the aid of mechanics than by any other process. In a course of instruction the students imbibe a knowledge of the principles of mechanics as a natural sequence, and by this means a practical knowledge of the problems of life are absorbed in a manner well calculated to develop the mind along practical channels.

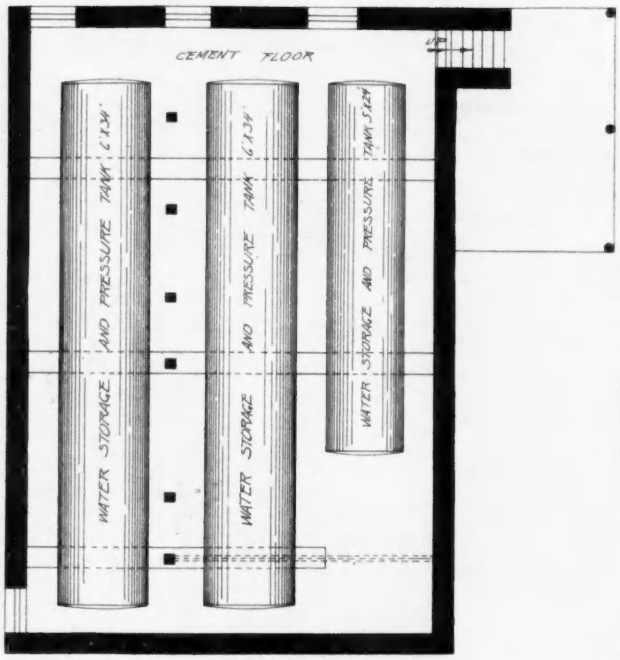
Every farmer and every business man is the better for having had a mechanical training. When a boy is told to make a box four inches long, three inches wide and two inches deep the problem seems simple, but when the work is complete and he shows the instructor a box of different dimensions it is of no use for him to contend that he has followed the instructions, because the measurements show the mistake beyond controversey; no argument applies, it is the acknowledgment of an untruth in concrete form and the lesson is driven home.

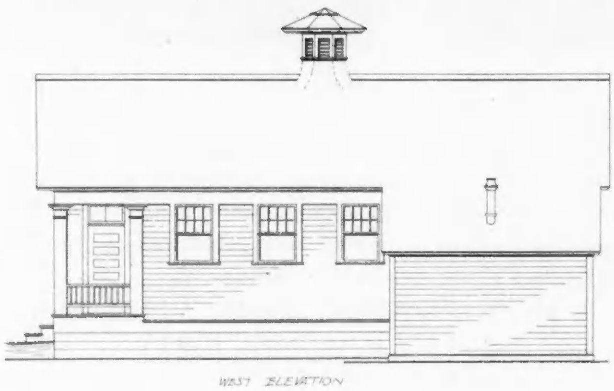
Most agricultural colleges have manual training departments, but the Geo. B. Robbins' farm at Hinsdale, Ill., is the first to introduce practical manual training on the farm. The accompanying drawings show the building on the Robbins' farm that has been fitted up for this purpose.

The building stands just east of the power house and contains the office of the farm superintendent, the blacksmith shop, and a room eighteen by thirty-five feet fitted up with the necessary paraphernalia for teaching the elements of mechanics. The blacksmith shop and working shop furnish practical appliances for working out the theories developed and set forth by drawings, which are made to scale in the manual training room proper. A tool case in one corner provides for the proper keeping of the necessary hand and machine tools to carry out the mechanical development of the plans.

The motto, "a place for every tool, and every tool in its place," is rigidly enforced, thereby demonstrating the value of system and order. The basement of this building contains the high pressure water supply tanks that hold the hard water, and the cistern water required for use on the farm. The tanks are supplied by pumps in the power house and from these tanks pipes are run to the other buildings, water tanks, etc.







PLANING MILLWORK

J. CROW TAYLOR

Use of a Pony Planer

IMPORTANCE OF PROPERLY ADJUSTING MACHINE TO SECURE SMOOTH WORK—CAUSE OF DEFECTS AND HOW TO REMEDY THEM

ECONOMY in lumber is a subject that is of especial interest to carpenters and builders these days, because of the great appreciation in value that has been felt during the past year. Moreover, while prices may vary more or less in the future, and conditions get a little easier than they appear right now, the fact remains that lumber values are being forced on to higher planes by scarcity of timber, so much so, that there is probably no subject which will offer better returns for closer study than that of economy in lumber.

There are two general ways to study and practice saving in lumber, one is to practice economy in the cutting up and using of lumber so that no part of it may go to waste, and the other is in the using of lumber of lower value to take the place of a higher priced material. This latter on first flash is suggestive of inferior substitutes and the practice of deceit, but if studied in the right manner and followed up in the right way it is nothing of the kind. There is in certain localities a tempting opportunity to use some neglected native woods for framing and various kinds of work which have not heretofore been looked on with favor, and they are now receiving some attention that should have been given them long ago. The main point in mind at present, however, in the study of economy along this line, is in the using of lower grades of the regular stock for higher purposes. Yard men who have planing mills have given attention to this idea right along, sometimes, for example, the yard man gets in a lot of No. 1 framing or joists, rather, out of which he can and does select some of the best pieces and uses them for door sills and heavy frame work, making them take the place of what is nominally higher grade lumber. They follow this same idea out in various ways finding it advantageous in many instances to work out defects in low grade stock to get a smaller article clear or practically so, and it is this idea that the carpenter with a few machines at hand to work with may follow out to advantage these days. And, if intelligently and conscientiously done, there is a chance to economize in lumber values without in any way injuring the quality of the finished product.

To do this, to do any working or re-working to advantage, one of the important machines is the planer, and usually the shop planer available for such service is of what we call the pony class, the machine that is sometimes looked on by mill men who operate massive planers as insignificant and not important, and yet when properly handled, it can be made to do a much better job of finishing than is generally turned out at the big mills.

At a recent meeting of the yellow pine manufacturers no less an authority on saw milling topics than Robert Fullerton in the course of an exhaustive paper on yellow pine and its manufacture, made this statement: "The time is coming when your material deserves better mill work. Ninety per cent of all flooring and ceiling is poorly matched and miserably trimmed." He might well have added to this also, that boards and dimension stock are poorly dressed, and what is known as finished is frequently poorly finished. All this does not help the man with the small shop planer in any way, but it does suggest the advisability of having at hand the means for putting a good surface on lumber, and especially on such stock as is to be reworked and raised by the taking out of defects to a higher grade. It is meet, therefore, that we make a study of the pony planer and see how to get the best results out of it in the way of smooth work.

Overhauling Pony Planer

In overhauling a pony planer to improve or insure the quality of its work, the first thing that should have attention is the cutter head and its journal boxes. It is quite a nice job, but there is nothing impossible about it, to adjust journal boxes on the cutter head so that it will turn freely and yet not be loose enough to shake and chatter in the boxes or raise up perceptibly when a board is fed under it and it settles down to work. There has been quite a lot of argument among technical writers about the fine features of adjustment in cutter head journals, some contending that the best work can be done with a bottom head only, cutting the under side of the board as it moves through the planer, and belted from below, because this insures its remaining rigidly in place and not giving any from the work. On the other hand, by having the head on top, as they usually are in single surfacers and cabinet smoothing planers, you get a flat rigid platen right under the cutter head for the board to rest on while the head is doing its work, and with this kind of rig properly adjusted in the journals there will not be much giving, and consequent waves when you start a piece through. In fact, waves on the end of a piece of work are generally due to other causes as will be shown further along. Of course, a head that is loose in the boxes will raise up and make a wave when starting into work, but they should never be run that way, and with proper attention they need not be. Put liners enough between the cap and box, made of paper, pasteboard or wood, as the occasion may require, so that the box may be screwed down firmly and be close enough on the journal that the cutter head will not shake perceptibly and yet not close enough to make it bind so as to turn hard when it is empty. It only takes a little patience to do this, and it should never be neglected.

When the journals are properly adjusted, if the cutter head shakes, the trouble nine times out of ten is due to lack of balance. This is a subject that has been treated of before, but should always be kept in mind, because lack of balance is the source of most all bad running in cutter heads. Usually, as has been pointed out, the cutter heads and bolts for holding the knives are originally properly balanced, and if they are all intact all you have to do is to balance the knives in pairs and put the pairs opposite each other on the head. Some heads carry only two knives, and planers of this kind require only half the time and trouble to balance and set knives, but they do not do as smooth work as four knives in a head, provided the knives are properly set. Even two knives, however, can be made to do very nice finishing if you do not feed too fast, and that is one thing that should always be guarded against when you want a good finish. It is the craze for fast feeds that is responsible for lots of the poor work being done at the big planing mills to-day, and this fact is being so generally recognized now that there is scheduled to follow an era of slower feed and better finish.

Setting the Knives

In setting the knives remember that the same idea which obtains with hand plane bits for getting smooth work also holds good on the machine. In other words, set the edge back close to the lip of the cutter, just as you set the cap down close on the hand plane for smooth work. On the matter of just how close opinions differ as they do in regard to hand planes, and the extension as a rule is practically the same as the allowance in hand planes, so you can be governed according to what you find is the best practice in hand planes.

After you have carefully adjusted the journals and fitted your knives to the cutter head, if your machine does not do as smooth work as you think it should, while the cutter head runs as well as could be expected, it is time to look elsewhere for the trouble. The first thing to look after is your rear pressure bar. See that it comes down firmly on the stock and is adjusted the same the full width of the planer, so that it holds the stock firmly through its full width, not pressing down tight enough to handicap the feed works, but enough to hold the stock from shaking. Then, turn attention to the front pressure bar or chip breaker and see that it rests properly on the stock. Then turn your attention to the bed and the loose rollers in it to facilitate the movement of stock through the machine. The chances are that it is here, in the bed of the machine, you will find, if you look long enough and carefully enough, the cause of waves made at the end of the pieces as they start through the machine. The rollers in the planer bed in order to fulfill their mission and make stock move and feed through readily are raised slightly above the surface of the bed, and the trouble is that they are too frequently raised higher than they ought to be. The roller just in front of the cutter head being raised higher than the bed holds the end of the piece passing over, up off the bed a little as it passes under the cutter head, thus inducing a little springing and chattering which in turn produces wavy cuts until the piece has passed far enough so that the pressure bar catches it and brings it down firmly to the bed again, after which it is held steady and moves along firmly, but when it comes through the machine you will find that the two inches at the end is dressed in waves. Now, the only way to cure this trouble is to get your rollers down, this one especially, until it just flushes the least bit above the face of the bed.

Adjusting the Rollers

To do this work properly, to adjust the loose rollers in the bed of your planer, run the bed down as far as it will go so you can have working room, then take a straight edge—a steel one is best, but the work can be done with a straight edge made from hardwood—run the straight edge through under the cutter head so you can see just how much the rollers are raised above the face of the bed. Let them down just so they barely will show light between the straight edge and the face of the bed, adjust them all this way carefully the full width of the bed, then try your planer and note the result.

You will probably find that your first efforts in this line will result in getting the rollers down so low that you will have difficulty in feeding the stock through, and then you are up to the problem of finding a compromise between free feeding and smooth work. To facilitate the feeding use a little oil on your planer bed; don't use much of it, because it leaves its mark on the back of stock going through and does not look nice, but if you are having trouble with wavy end stock, and smooth work is important, it is better to use a little oil and not so much roller extension above the bed to facilitate feeding. If your stock does not feed with this persuasion, raise the rollers carefully, a little at a time, until it will feed through, but bear in mind that to insure smooth work, the closer you can keep the top of the rollers down toward the level of the bed, the better it will be. In fact, the best work of all could be done with a perfectly flat bed without any rollers, but that is impracticable with the ordinary feeding mechanism of such planers. Still, by keeping this fact in mind it will help you to remember that the less you raise your rollers above the bed the less danger there is of making waves in the end of the stock.

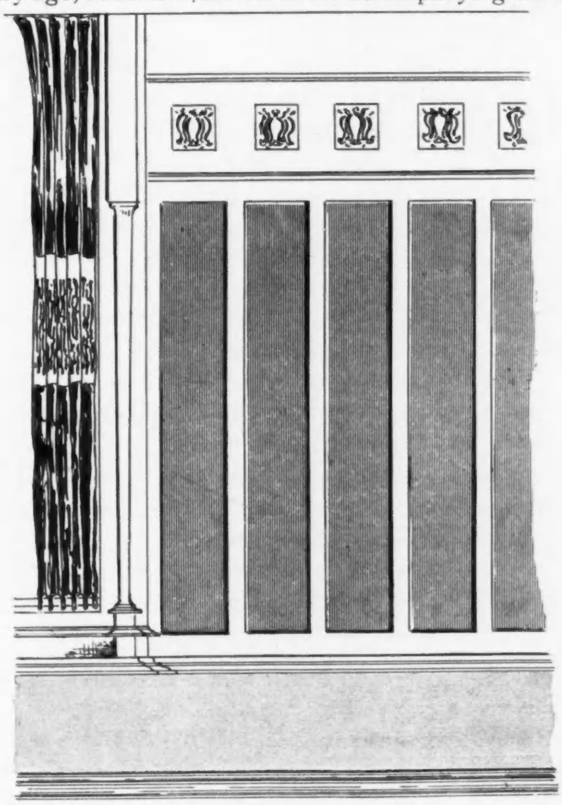
Another practice that leads to waving is that of feeding two or more pieces through a machine at a time and this is another case where we gain speed at the expense of quality. If one is working comparatively narrow stock and making only a light cut, the natural disposition is to feed at least two pieces at a time, one on each side of the machine. But it is not good practice even with sectional feed rolls. Where the feed rolls are solid and not sectional, if there is much difference in thickness, the thin piece will not feed through well, because the roller is held off of it by the thick one. Because of this difficulty of feeding with solid rolls the machinery men have made planers with sectional feed rolls to insure the feeding of a number of pieces at the same time, though they may vary considerably in thickness. They do the work very well, too, so far as feeding is concerned, but when the stock strikes the front pressure bar or chip breaker the thick piece will hold the bar up off of the thinner one, and as a result it is not held firmly in front of the cutter, and this leads to wavy cutting at least until the piece gets far enough through to be caught by the rear pressure bar. After it reaches that point it is held better, because presumably all stock is the same thickness after it passes the cutter and the back pressure bar can be made to hold any number of pieces. The trouble is with the front pressure bar or chip breaker which fails to do its work properly where two pieces are fed at once and there is any appreciable difference in the thickness. Ordinarily, therefore, to insure smooth work, you should observe these two rules: First, run one piece at a time; second, have the loose rollers in the planer bed down as low as you can get them and still feed the stock through with satisfaction.

Suggestions for a Reception Room

SHOWING HOW A VERY PLEASING EFFECT CAN BE PRODUCED—COLORS TO USE TO GET A HARMONIOUS EFFECT —LIGHT AND GRACEFUL FIGURES SHOULD BE USED

By Sidney Phillips

A VERY pleasing effect can be produced in a reception room by a paneled treatment, having a suggestion of the English classic styles of a century ago, such as is shown in the accompanying sketch.



The woodwork is intended to be finished in deep ivory, with a stenciled design in gold on the square panels in the base. Care must be taken not to make the ornaments too heavy, but a light and graceful figure should be chosen.

The tall panels should be filled in with a bright red or a strong yellow tapestry in a single color, or a figured, yellow tapestry having a silk damask effect might be very advantageously used.

The frieze should be very light in tone, preferably an ivory colored burlap or buckram, somewhat deeper than the woodwork in color effect.

The delicate semi-detached columns or pilasters, square in section and tapering from the base to the cap, give an exceedingly dignified effect to the window and door openings. It will be noticed that the moulding which forms the cap of the paneling breaks out to form a shelf above the door.

This treatment will suggest many others in which fabrics of plain color may be very effectively used in connection with wood mouldings to form panel effects.

Sliding Door Hints

There are other things about the sliding door that should not be overlooked. The bumper, for instance, is sometimes forgotten to be put in the back end of the pocket, before the ceiling of same, or the plastering is done. Then again if the bumper is provided for, more than likely it is simply a block, a piece of two-by-four nailed on the floor, so that when the door is run back the momentum of same causes the top to move on beyond the proper stopping place, then there is a sudden rebound and an unnecessary jar that is anything but helpful to the door, and the adjustment of the hanger.

PAINTING

EDWARD HURST BROWN

Painting the New House

USE OF LIQUID FILLERS COMPARED TO PASTE FILLERS—HOW TO DETECT A CHEAP FILLER—ADVANTAGES OF USING A GOOD MATERIAL

LIQUID fillers, so-called, are not properly termed fillers, because they are not intended to fill up the pores of open grained wood, as paste fillers do, but are intended to be used upon the surface of close grained woods, such as white pine or whitewood, or as a second coat over a paste filler, for the purpose of stopping suction and producing a smooth and level surface upon which a subsequent coat or coats of varnish are to be applied. The name surfacer is more correct for these materials than liquid filler, but the latter name having been given by the manufacturer who first introduced them to the trade, about thirty years ago, was taken up very generally and is now almost universally applied. At best, however, they are intended as substitutes for shellac or for a coat of varnish. Prior to their introduction, shellac was generally used as a surfacer, but this material having become quite expensive owing to the high cost of the gum shellac and the high tax on grain alcohol, these liquid fillers were offered to the trade as substitutes for the more expensive article. Many hardwood finishers recommend using varnish from the surface of the wood up to the finishing coat, in the case of close grained woods, or directly upon the paste filler in the case of open grained woods, and this practice has much to recommend it; for varnish is not affected by dampness, as shellac is, and again it would exert no chemical action upon the subsequent coats of varnish, such as some of the liquid fillers appear to do.

A recent test of a number of liquid fillers, made by Mr. Thomas B. Akin, of New Bedford, and shown before the Massachusetts Society of Master Painters and Decorators, at their convention held in Boston, in January of this year, distinctly showed that different makes of liquid filler applied to panels of the same wood (Georgia pine), affected very differently the after coating of a well known brand of varnish, with which the panels were coated, after a year's exposure upon the inside wall of his paint shop. None of the liquid fillers gave as good results, however, as shellac.

Liquid fillers are made, usually, by incorporating very finely ground silet into a good varnish of medium price, and thinning down to working consistency with turpentine or benzine. Those thinned with turpentine are the best. China clay is also used in the manufacture of liquid filler. But, of course, it is impossible to give the exact composition of any of the liquid fillers on the market, as their manufacturers regard the formula as a valuable trade asset. Much depends upon the manner of mixing the ingredients, the degree of heat used in "cooking" them, and the various processes of manipulation used.

The cheaper grades of liquid fillers are made from cheap rosin varnish, which has a tendency to soften up subsequent coats of varnish applied over it. As a rule, cheap liquid fillers are worse than useless, except to the "cheap John" painter who cares nothing for his reputation and whose only thought is to produce a job which shall look all right till the architect passes it and he collects his bill from the owner. Some varnish manufacturers are unscrupulous enough to offer as liquid fillers cheap rosin varnishes doctored with a chemical that causes the liquid to appear filled with a very fine white powder. They claim that this is a genuine pigment filler, pointing to this cloudy appearance as the pigment, and claiming that by a peculiar process they are enabled to hold the pigment in suspension and thus avoid settlement and obviate the necessity for thorough stirring before using. It may be stated, however, that any genuine pigment liquid filler, of necessity must settle, for the pigment is invariably heavier than the vehicle, and always requires thorough stirring before being used.

One of the greatest disadvantages of a liquid filler is that the pigment will in time cause the finish to appear cloudy, as the oil in the filler gradually oxidizes. The greatest value of a good liquid filler is that it is more easily applied than shellac and is more economical. The pigment stops the suction of the wood and holds out the subsequent finish better than a priming coat of varnish not containing pigment.

Testing Linseed Oil

To the Editor: Ghent, Minn.

What is the best method of testing linseed oil to see if it is pure, also for testing white lead and zinc white.

A. Huisenfeldt.

Answer: The simplest tests for the purity of linseed oil are the smell and the taste. Good, raw linseed oil should be of a light yellow color—a greenish oil usually indicates that it has been made from unripe seed and is not fit for use in first-class paint. Pure linseed oil, when first placed on the tongue has a bland taste turning afterward to slightly bitter and rasping. The presence of either rosin or mineral oil as an adulterant gives a decidedly nauseating taste. A few drops of pure linseed oil rubbed briskly between the palms of the hands should have only the characteristic odor of flaxseed; a faint odor of rosin indicates adulteration with rosin oil, while an odor of machine oil shows the presence of mineral oil. If there is a sweet, mealy smell of fish or menhaden oil is very difficult to disguise when the oil is heated, but fish oil is now very little used as an adulterant. If a drop of the suspected oil be placed on a piece of black japanned tin or on a sheet of glass, painted black on the other side, the presence of mineral oil will be indicated by a bluish irridescence or bloom, when held in a strong light, sometimes extending as a ring beyond the drop of oil.

A simple test is to make a freezing mixture of ice and salt, placing a small portion of the suspected oil in it, with the bulb of a thermometer in the oil. If the oil congeals to a solid or butterlike consistency at a temperature higher than 18° below zero, it is not pure linseed oil, but may contain an excess of water or may be adulterated with rosin oil (freezing point, zero); cotton seed oil (freezing point 6° F.), or rape seed oil which is apt to come from imperfectly cleaned seed, and which freezes at 25° F. Fish oil has a still higher freezing point, 32° F. or that of water.

The first test usually made by a chemist to detect the presence of impurity in linseed oil is to place equal quantities (say half a fluid ounce) of the suspected oil and nitric acid of 1.40 gravity, in a glass test tube or glass phial, shaking very thoroughly, and then allowing it to stand ten or fifteen minutes until two separate layers of liquid have formed. Where the oil is pure raw linseed oil, the upper stratum is light cinnamon brown (in the case of boiled oil it is a trifle darker), while the lower layer must be colorless, or nearly so. When rosin oil is present, the upper layer will vary from dark olive to black, depending on the percentage of adulteration, and the lower layer will vary from straw color to orange. The presence of heavy mineral oil will show the same colors as rosin oil. Fish oil will give an upper layer of brown to brown black, while the lower layer will vary from light to dark orange. Cottonseed oil (very rarely used as an adulterant, nowadays, since it costs as much or even more than linseed oil) is indicated by an upper layer of reddish brown and a lower layer of pale yellow. This nitric acid test, while accurate, when properly understood, may prove inconclusive and misleading in the hands of a novice; although after a little practice it becomes simple and easy to perform.

Tests to determine the percentage of adulteration are both difficult and complicated and require an experienced chemist. The foregoing tests determine only that adulterants are present and the nature of them.

White lead purchased in unbroken packages bearing the brand of any reputable corroder is reasonably certain to be pure. Occasionally it may contain a trifle of silver, or of uncorroded blue lead, either of which renders the white lead off color. But when white lead is offered under fancy names, either branded with a jobber's or grinder's name, or with no firm name—and especially when it is offered at less than the current market quotations for white lead, one may feel certain that it is a so-called combination lead, or a mixture of white lead, zinc white and barytes, or barium sulphate. In many cases these combination whites consist only of zinc white and barytes, yet they are almost always labeled white lead, or "pure white lead," and frequently bear a guarantee worded like this: "The white lead in this package is warranted to be strictly pure." But the guarantee does not state that "the contents of this package are pure white lead." The first wording merely guarantees the purity of such white lead as the package may contain and says nothing about the other materials which go to make up the larger portion of the mixture.

To test white lead in oil for purity, scoop a small hole in a piece of charcoal and place in it a portion of the lead about the size of a small pea. A gas flame, or the flame of a spirit lamp is then directed upon it by means of a blow pipe. The lead must be held in the point of the flame and a steady blast must be maintained by means of the cheeks. A little practice will enable one to do this without difficulty. A minute or two should reduce the white lead to a button of metallic lead; provided it is free from adulteration. If any zinc, barytes, whiting, clay or silica be present—even if only five or ten per cent, no metallic button can be formed, but the substance left will be a whitish, yellow or gray cinder-like mass.

To test dry white lead for the presence of barytes (the most usual adulterant), place about 20 grains in a test tube which should be filled about half full of dilute nitric acid. Pure white lead will completely dissolve, with some effervescence, while barytes will remain as an insoluble precipitate in the bottom of the tube. The oil may be removed from white lead ground in oil by placing it on blotting paper and saturating it with benzine or gasoline, which is then allowed to evaporate.

White lead, however, may be pure, yet of inferior quality, owing to imperfect corrosion or lack of care in its manufacture. A good white lead should be reasonably white, with a very slight yellow tone as distinguished from the dead white of zinc white. The quick process leads are, as a rule, whiter than those made by the old Dutch process. A dark, somewhat gray color indicates imperfect corrosion. The lead should be of good density and not too oily, but should be ground so as to "string out" when taken up from the keg with a paddle. Lead of this character does not break up so readily as a lead that is "short," but is much more durable for outside work. In New York

City, where most of the painting is indoors, a brand of lead that is ground in oil direct from the "pulp lead," or the lead that comes from the washing machine, is in much favor with the painters, because it breaks up readily and flats without difficulty, while in other places this brand is not liked as well as some others because it does not hold its gloss so well as the lead which is dried on a steam-heated pan before grinding in oil and is then ground to a stringy consistency.

Zinc white is apt to be adulterated with barytes, whiting or china clay. It may be tested by removing the oil in the same manner as described for testing white lead, and placing a small portion, say 20 grains, in a test tube and adding dilute nitric acid to half fill the tube. Pure zinc white should completely dissolve without effervescence. Any residue indicates adulteration with barytes (the most usual adulterant) or china clay. If effervescence occurs, the presence of white lead or whiting is indicated, most likely the latter, since white lead would not be apt to be used as an adulterant.

Hanging Sliding Parlor Doors

FULL DESCRIPTION OF HOW TO PROPERLY CONSTRUCT THE SAME—WHAT MATERIAL TO USE AND WHERE TO USE IT—HOW TO MAKE THE DOOR SLIDE SMOOTHLY

As the question of hanging sliding doors is one which is of interest to all carpenters and builders it has been thought advisable to give a detailed description of the same.

To the Editor: Tioga, Texas.

Please give through your journal the best method for hanging sliding parlor doors. B. L. HENDERSON.

Answer: There are now many patented hangers on the market, each possessing more or less merit. Those

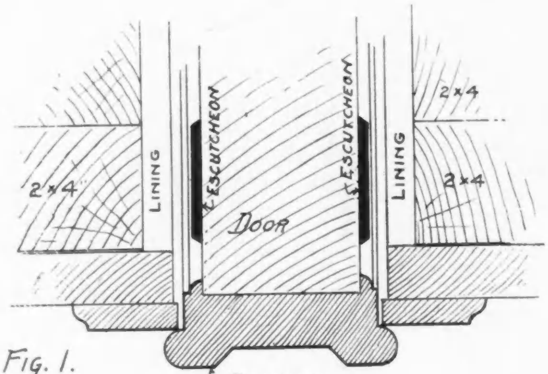


FIG. 1.

with the steel track have largely superseded the wooden, of a few years ago, and the hanging of same is an easy job to what it used to be. Full directions are furnished with each set and any of the leading kinds can be secured through the up-to-date hardware dealer. Any average workman should be able to put up the work. The main thing is to see that the partition rests on substantial bearings to prevent settlement, as this will necessarily throw the track out of level and affect the free working of the doors. Be sure to set the studding plumb and properly spaced for the pocket. Never set the studding flatwise with the door. Never allow a hot air pipe to run up beside the sliding door, when it is possible to place it in some other partition. Always double the studding at the jambs and be sure to make proper calculations for the opening so that when the finished work is in place, the full face of the door will show when closed. Be sure to have the woodwork over the opening perfectly rigid. Two well seasoned joists spiked together and set up edgewise make a good truss, or lintel, and an excellent surface on which to secure the track. The short studs can rest on this lintel and can be retrussed by cutting in cross braces, or truss shape braces can be put in above the hanger. In this, the workmen should take into consideration the load that is to be carried above and build accordingly. In good work, the pockets should be lined with tongue and grooved boards, which may be done with thin stuff, but whether this is done or not, be sure to have the pocket openings cut off at the back end so that there will be no connection with other openings in adjoining partitions and outer walls. This should be done for several reasons. First, to heat the house, because these openings will create a draft, then again if a fire gets started in a partition, these openings furnish an excellent draft to fan on the flames.

Another point we might call attention to and that is, the unsightly knotching out of the stops to allow the raised escutcheon to pass into the pocket. This

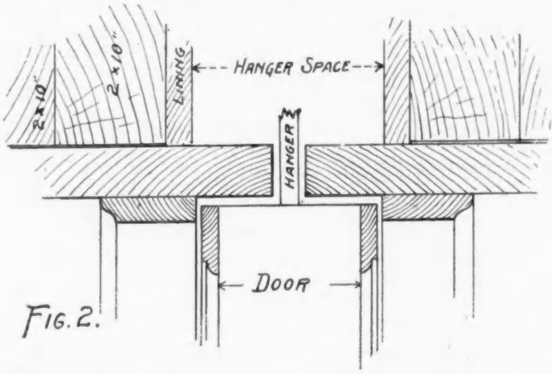


FIG. 2.

can be avoided by running a stop around both sides of the door and membering with the astragal as shown in Fig. 1. The stop on the jambs are set as shown. Thus, it will be seen that the escutcheon is cleared and that when the door is shoved back, the astragal will cover the pocket opening and to all appearance is simply a mould made fast to the jambs. The head jambs should be set to allow only for the free working of the hanger as shown in Fig. 2.

PLUMBING

WM R. MARSHALL

Cellar Drainer or Water Elevator

FULL DESCRIPTION OF HOW TO REMOVE WASTE WATER FROM PLACES BELOW THE LEVEL OF THE SEWER—ILLUSTRATIONS SHOWING DRAINERS USED

VERY often it is necessary—and it is always a good practice—to drain the soil around the outside of a foundation wall. Sometimes it is thought impossible to do this, owing to the fact that the sewer is higher than the level of the drain.

To drain cellars, wheel pits, furnace, cesspools, etc.,

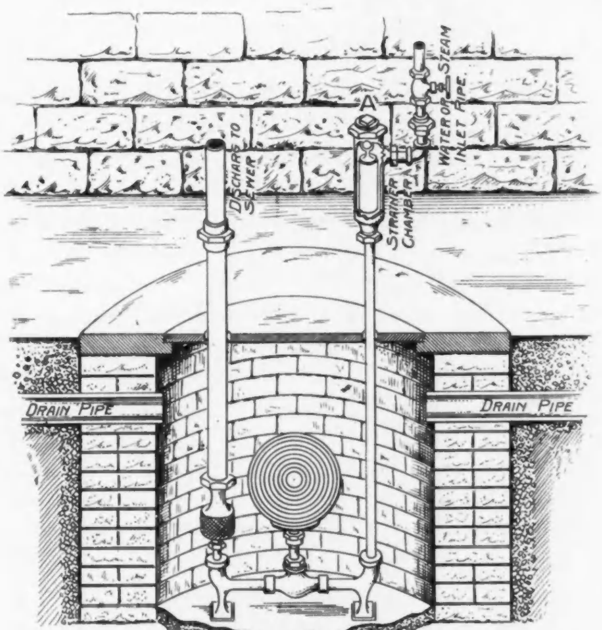


FIG. 1.

removing waste water from kitchens below the level of the sewer, drippings from ice-boxes and for any purpose where it is necessary to remove water economically from one level to a higher one, the automatic cellar drainer (of which there are several makes on the market) seems to answer the purpose on a small scale very satisfactorily.

Taking the minimum pressure outside of Chicago, i. e., 40 pounds to the square inch, a small cellar drainer has a capacity of four hundred gallons per hour, and is made in larger sizes up to a capacity of fifteen hundred gallons per hour. With additional pressure, it will throw, proportionately, a greater amount of water.

A cellar drainer of this type will elevate seepage water one foot for every five pounds of city water pressure.

In Fig. 1 we show the arrangement of valve and unions, and it should always be installed in this way, so that the drainer can be disconnected and taken out of the pit any time to be repaired and cleansed. A swinging check valve should be placed at the discharge pipe, should there be any possibility of back water getting into the same, while in the cut we show a brick pit which is substantial and lasting. A very good strainer pit is made of an old barrel, with a few holes bored in the side and bottom of same. In operation, a drainer of this type performs its functions by passing water or steam under pressure, through the drainer point or jet, thus creating a suction which draws the water from the barrel or pit in which the drainer is placed into the discharge pipe, and both the jet water and the cellar water are discharged together. As long as the city water or steam passes through the drainer point or jet, this suction and discharge is continuous.

The accumulation of water in the barrel or pit raises the float ball gradually, and when the water has accumulated about eight inches in depth, the float

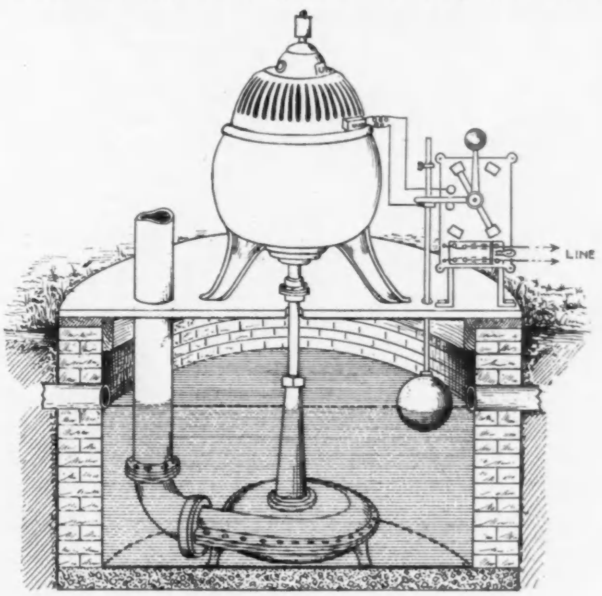


FIG. 2.

ball opens the supply valve. When the water has been removed from the barrel or pit, the valve is closed by the ball dropping back and closing the valve, and the drainer becomes inactive until the water again accumulates, when the valve is opened and the water is discharged as before.

This drainer can also be purchased without the automatic attachment and is used where there is always somebody to attend to same, and is not to be recommended for cellar or any place where water accumulates unexpectedly or irregularly.

This type of a drainer or elevator is especially adapted for light work.

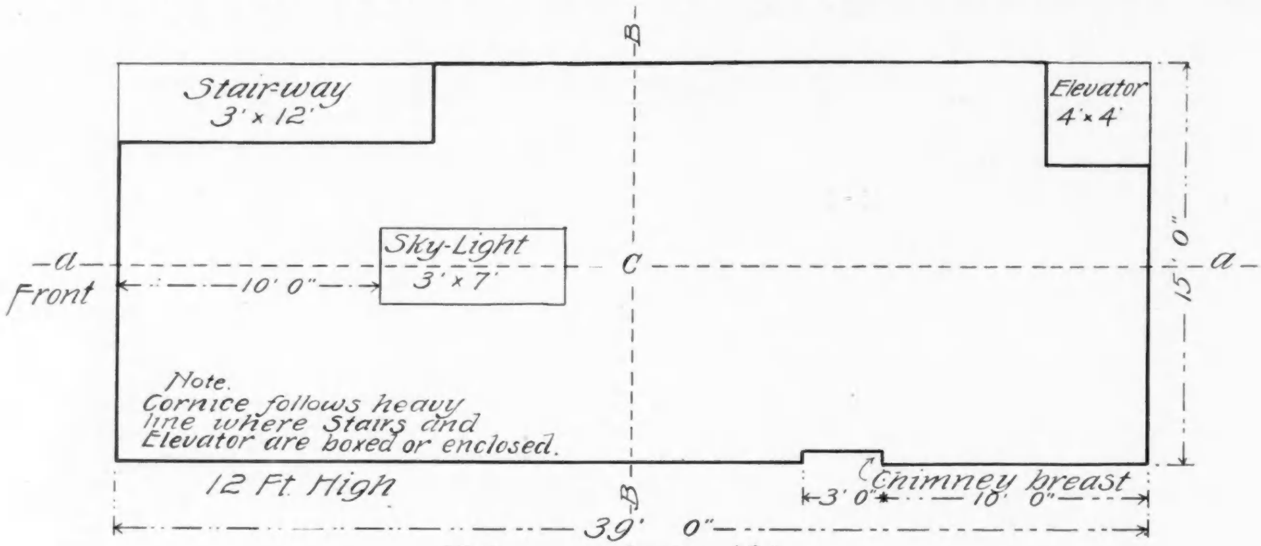
In Fig. 2 we show an electric ejector or Bilge pump, which can be had to meet any conditions or capacity necessary, while the first cost, including cost of installation, is greater. The expense of running it is very slight. The operation of this device is that the water rising in the pit raises the copper float, which in turn throws the switch on, starting the motor and pump immediately, the ball receding as the water is pumped out, gradually opens the switch, and when the water is pumped out to the level at which the ball is set to stop pump, the switch is wide open and remains so until the incoming water again gradually raises the float and throws on the switch. A pump of this type and arrangement can also be used as a supply pump from spring, well or cistern to an elevated tank by a system of chains running on small pulley wheels to float in tank, and is often used for that purpose.

Use of Metal Ceilings

HOW TO PUT THEM ON INTELLIGENTLY—COST OF SAME GIVEN IN DETAIL—REASONS WHY THEY ARE PREFERABLE TO ANY OTHER KIND

By W. W. Daniels

THE possibility of stamped metal for interior decoration is unlimited, especially for the ceiling. The carpenter or builder should know how to figure for this class of work intelligently, for only simple rules are used, no matter the size or shape of the room. First, find the square feet in the ceiling. For example, take the sketch here shown; the room is 15 ft. × 39 ft. = 585 sq. ft. Now deduct for all openings in the ceiling such as stairways, skylights, elevator openings; in this case we have one stair opening, 3 ft. × 12 ft. =36 sq. ft., one skylight 3 ft. × 7 ft. = 21 sq. ft., one elevator opening, 4 ft. × 4 ft. = 16 sq. ft. 36+21+16=73 sq. ft. Now, 585 sq. ft.— 73 sq. ft. = 512 sq. ft., the total sq. ft. in the ceiling proper. A metal cornice is used to make a finish at the angles of the ceiling and walls. The depth is governed by the height of the ceiling—we will say a 12-inch cornice has been selected; (a 12-inch cornice has 18-inch girth measurement); now that we have the total sq. ft. from wall to wall, we will only add 12 inches for the cornice for a room 15 ft. by 39 ft. It will require about 120 lin. ft. of cornice, as it takes some excess for making mitres (the cornice should be mitred at all angles). This should be added to the sq. ft. in the ceiling, 512+120=632 total sq. ft. The deeper the cornice, the greater the cost of the material. The selection of its depth is governed by the height of the ceiling, unless its cost is to be considered. For a room 12 ft. high the depth of the stamping in the metal must be considered, in making a selection of designs. After the selection has been made and price agreed upon, multiply the cost of the metal by the sq. ft. in the ceiling, including the depth of the cornice, say 3c per sq. ft. is the cost of the metal; 3 multiplied by 632=$18.96,—to this must be added the cost of labor for erecting, say $2.00 per 100 sq. ft; 2 multiplied by 632=12.64. Thus must be added to $18.96.



Plan of Ceiling.

\$12.64+\$18.96=\$31.60, total cost of material erected, not including wood strips. Wood strips must be used unless the design is shallow stamping and goes on solid wood ceiling when it goes on joist or over old plaster ceiling. If wood strips must be used add 50c per 100 sq. ft. of metal. In the above ceiling there is practically 6 squares, 6×50c=\$3.00 for wood strips. \$31.60+\$3.00=\$34.60, total cost including labor. In some cases it will be necessary to add freight. The metal boxed for shipment weighs 70 lbs. per 100 sq. ft. and takes 4th class freight.

Erection of Ceilings

A metal ceiling is up-to-date, practically indestructible and moderate in cost, easily erected by a good mechanic and will add not only to the carpenter's or builder's profit on his present contract, but one good job will always bring another. The carpenter or builder is almost always called upon to either erect or superintend the erection as he has the building under contract, especially in small towns. In laying off a ceiling strike a center line as at a-b and work both ways. First strip crosswise the joist, working both ways from the center; then, cut in cross strips or headers 2 feet from center to center nailing them securely to the joists. In applying the metal start in the center as before and work all four ways, laying the plates so that the joints are running from the light merely tacking in place until the field is all on. Then the cornice should be run around the room, the border or moulding next, then the filler. Where strips are used they should strike every joint in the metal so the lapping joints could be all securely nailed. A small special cone-headed nail should be used. They are always furnished with the metal by the manufacturer. The metal usually comes painted, one coat of white lead, each side. We now have the above figured and erected in a workmanlike manner at a cost of \$34.60, ready for the painter. Bright colors should be avoided, for the best results can be had with a one-color treatment for which add \$1.50 per square for two coats.

A Model Club for Employes

The Allis-Chalmers Club, of Milwaukee, Wis., has issued an attractive little brochure containing its constitution and by-laws, which are very complete and concise. The printing of these rules is not, in itself, particularly noteworthy; but it calls attention to a class of organizations that are being formed in connection with some of the largest manufacturing and industrial plants of the country, viz.: clubs designed to contribute to the comfort, social intercourse and efficiency of employees. The Allis-Chalmers Co. has established for its office men, superintendents and foremen a well-appointed club, occupying quarters in a former mansion house near the works, where, for a nominal yearly fee, members are given all the benefits usual to such organizations. During the noon hour a course dinner is served at approximately what the service actually costs, and supper may also be had by those who are obliged to stay late at the office.

As the club building stands in a residence district and is easily accessible from all parts of the city, it is kept open every evening for the benefit of members, who make free use of the periodicals, games, etc., contained in the reading room. Nights are also frequently set apart for general receptions and entertainments given separately by members of either sex, the annual dues being devoted to a fund for such purposes.

The action of the Allis-Chalmers Co. in founding and maintaining this club is one which other manufacturers can well afford to emulate; for its effect upon employees and their working efficiency is extremely beneficial. One of the greatest of the advantages to be derived is from bringing men in different departments together, at least once a day, thereby tending to establish more of a feeling of fellowship and consequently closer co-operation between them.

Apartment-House Construction

One of the most remarkable features of the building operations in Chicago for the past year is the amount of apartment-house or flat construction, which has been carried on on a scale of unprecedented magnitude, says Building Manager and Owner.

It had been thought that flat building in Chicago was overdone, and when in 1904 the total of the year's operations reached over \$14,000,000 compared with \$7,000,000 for 1903, it was expected by many that a slump would surely come and that the figures for 1905 would show a considerable falling off. So far, however, from that being the case, the figures of the past year show the remarkable total of nearly \$22,000,000, taking into account only building permits of \$5,000 and upwards. It is true that these figures include buildings of the combination character, containing both flats and stores, but these form only a small proportion of the total.

It is evident from these figures that the people of Chicago are inclining more and more to residence in flats. The total of house construction, including only permits above \$5,000, amounted for the year 1905 to less than \$3,000,000, the greatest percentage of house building having been in the northwest section of the city.

It might be thought that, in view of the rapidity with which flat buildings have been constructed during the year, it would be difficult to fill them, but the contrary is the case, and all reports from owners, builders and agents agree that rents are well maintained, which is a sure evidence of the fact that the supply has by no means outstripped the demand.

If we could all have our wants filled at once it wouldn't end it, for we would start in right away and create bigger wants.

MANUAL TRAINING

IRA S. GRIFFITH

Something the Boys Can Make

FULL DETAILS AND DESCRIPTION OF HOW TO CONSTRUCT A MISSION TABLE—KIND OF MATERIAL TO USE AND WHAT FINISH TO PUT ON WHEN COMPLETED

FIG. 1 is a good example of the heavier Mission furniture and is of rather pleasing proportion. It contains, in addition to the common mortise and tenon previously described, the keyed tenon.

Nothing but well seasoned stock should be used if satisfactory results are expected.

Four legs, each thirty inches long by three and three-quarter inches square should first be gotten out. Square up these pieces in the usual way, being careful to have the working-face level as well as straight.

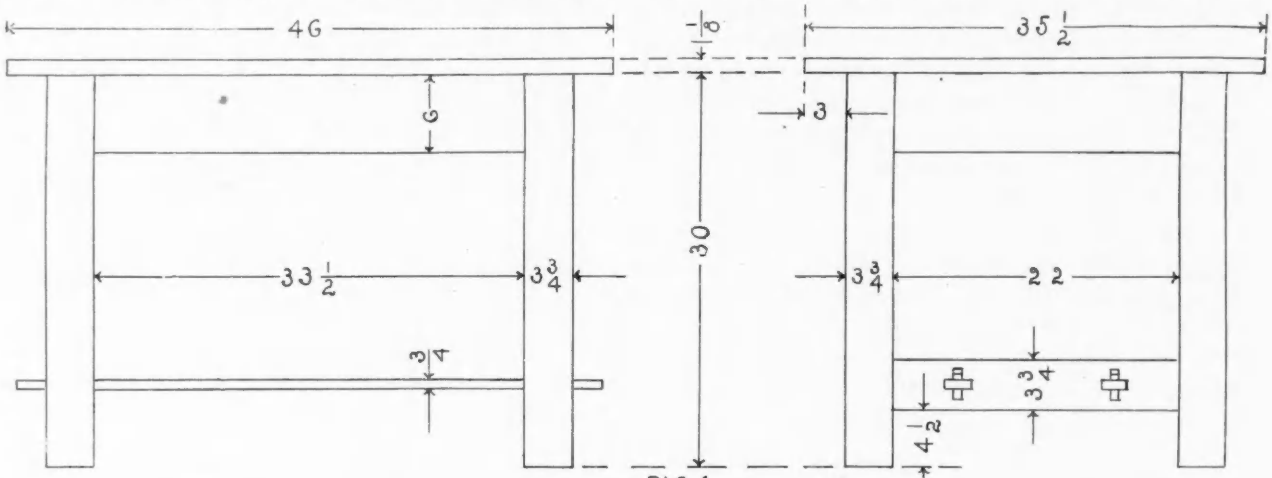


FIG. 1

If there should be warp or wind in the working-face, all the other sides will be similarly affected since they are squared either directly or indirectly to this face. Any warp in the legs will tend to throw the framework out of shape when the parts are assembled. The winding sticks should be used frequently in testing the working-face.

Next, plane up the side-rails. These two pieces should each be squared up to a length of thirty-six and one-half inches, and a width of six inches, with a thickness of seven-eighths of an inch.

The two end rails are to be squared up to twenty-five inches by six inches by seven-eighths of an inch.

The lower rails into which the shell centers its tenons are to be squared to twenty-six inches by two and three-quarters inches by one and one-eighth inches.

In all cases where tenons are to be cut on the ends of the pieces which are to be squared up, end planing can be avoided by marking square across and sawing exactly to the line.

The making of the top and shelf will require skill. For the top, proceed as follows: Select good clear boards and cut them to a length of about four feet. Saw enough so that the sum of their widths, when they have had their edges jointed and glued together, shall make thirty-six or thirty-seven inches. They should be of sufficient thickness to dress to one and one-eighth inches after they have been doweled and glued.

Joint up their edges straight and square. Only one edge of each of the outside boards need be jointed. Test to see that they fit by placing the edges one against another.

Clamp these pieces in the vise in pairs as shown in Fig. 2; and, with the trysquare and a sharp pencil, mark across the two edges at places about eighteen inches apart. Set the gauge so that it will mark the middle of each piece and cross-gauge each of these lines, gauging from the surfaces which are to make the upper surface of the top. At the intersection of the pencil and gauge lines, bore three-eighths-inch holes to a depth of one inch.

Cut off enough dowels and placing a touch of glue on one end of each drive them into the holes, Fig. 2; after having glued the edges of the boards, cabinet makers' clamps should be used to clamp the whole together. If the boards show a tendency to buckle while in the clamps, it may be necessary to fasten a stout piece across the grain on each side by means of the hand clamps.

Prepared cold glues are quite common now-a-days and answer fairly well. If, however, hot glue can be had use it.

The shelf of the table is similarly prepared but is to

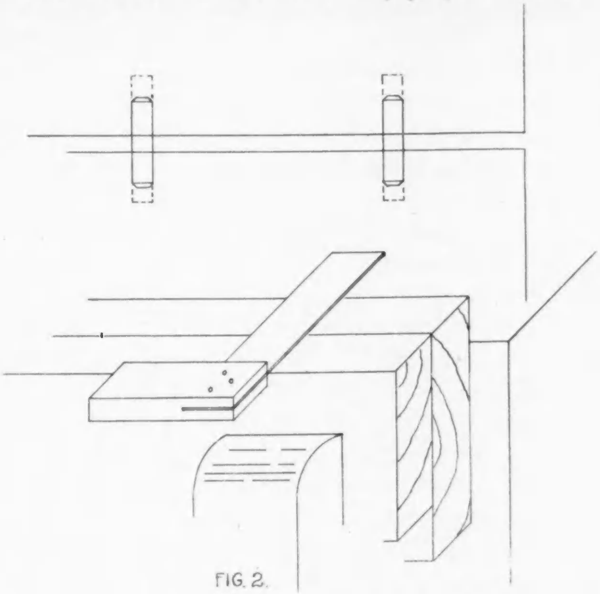


FIG. 2.

be made of stock which will dress to three-quarters of an inch. In cutting the shelf boards, allowance must be made in the length for the keyed tenons. They should be cut roughly of almost the same length as those of the top. The sum of their widths should approximate two feet in the rough.

After the glue has hardened, surface or plane smooth and level both sides of both top and shelf. This will require considerable patience. The reason

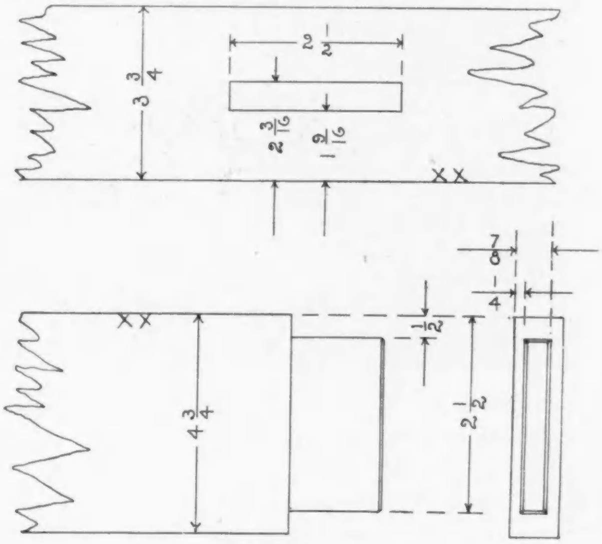


FIG. 3.

for not planing the boards before gluing them together is because of the impossibility of doweling them so as to make the surfaces match with sufficient accuracy.

Square up the top to forty-seven inches by thirty-five and one-half inches. The shelf may then be squared to forty-four and three-eighths inches by twenty-two inches.

While waiting for the glue to harden, the mortises may be cut. In order that no mistakes shall be made in placing them, set the legs upright in the positions they are to occupy relative to one another with the xx sides facing outward, and mark in some way their approximate location.

Place the legs side by side, with those sides into which the tenons of the cross-rails or ties enter so that they shall face upward. Even the ends, using the large square. Measure from the lower ends of the legs five inches and square a light pencil line across the four pieces. From this line measure three and one-half inches and square another line across the pieces.

While the legs are in this position, measure from the top one and one-half inches and square a line across. From this line measure four and one-half inches and repeat.

Now turn up the sides into which the long rails are

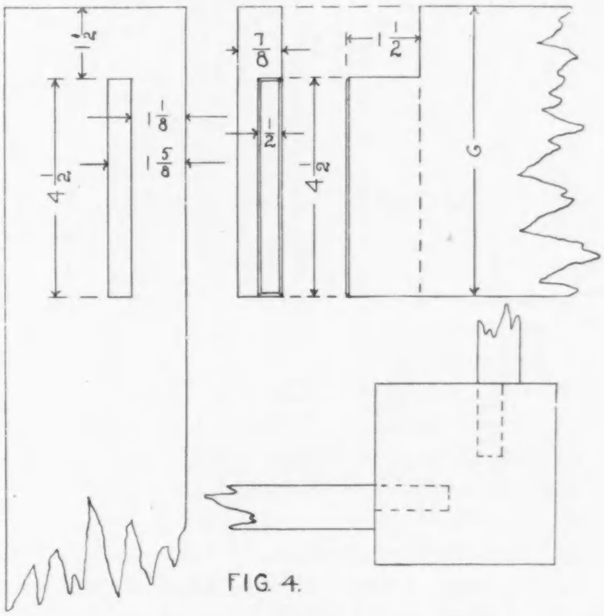


FIG. 4.

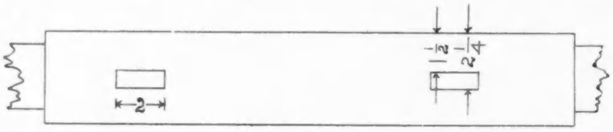
to enter their tenons and mark, measuring first one and one-half inches then four and one-half inches as was just done. These marks locate the ends of the mortises.

For the lower mortises, Fig. 3, set the gauge first to one and nine-sixteenths inches and gauge. Next, set the gauge to two and three-sixteenths inches and complete the marking of these mortises. Remember that all gauging is done from the xx sides. For the top mortises, Fig. 4, set the gauge first to one and one-eighth inches then to one and five-eighths inches.

The mortises at the top of the legs are to be cut to a depth of one and one-half inches; those at the bottom to two inches. The manner of cutting has been described in previous numbers of the magazine.

The tenons on the rails are cut with a length of one and one-half inches. They are shouldered on one side and one edge. The gauge should be set first to one-half an inch, then to four and one-half inches, Fig. 4; the gauge block being held against what is to be the inside surface for the first marking and against what is to be the under edge for the second marking.

The tenons for the lower rails or the ties are to be two inches long and are to have shoulders on all sides, Fig. 3. The gauge is set to one-fourth of an inch, then to seven-eighths of an inch, the block being



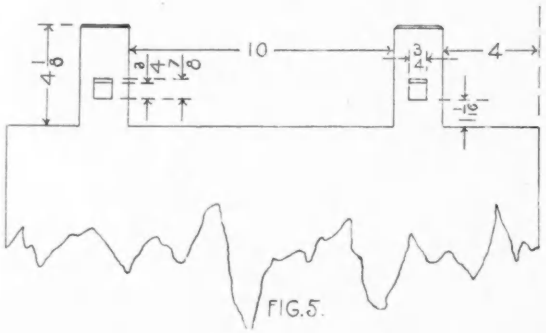


FIG. 5.

held against the side which is to face outward. Next set the gauge to one-half an inch, then to two and one-half inches, gauging from the edge which is to face upward.

Much time can be saved by using a mortise gauge, a gauge having two spurs. By means of this tool both sides of a mortise can be marked at the same time.

The keyed tenons, Fig. 5, are laid out by measuring from one end of the shelf a distance of four and one-eighth inches and squaring a line across at this point. Along this line, measure from the edge of the shelf consecutively four inches, two inches, ten inches, and then two inches. There should remain four inches between this last mark and the remaining edge of the shelf. At these points, carry out lines towards the end which shall be at right angles to the cross-line. The steel square can be used to do this.

Repeat these measurements at the other end of the shelf, making sure of a distance of thirty-six and

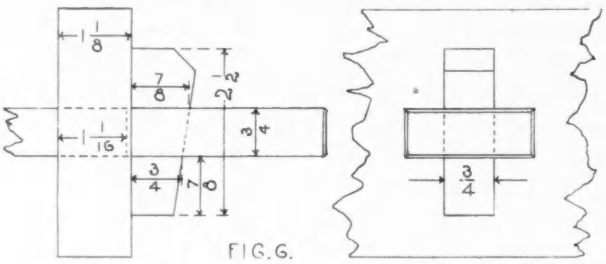


FIG. 6.

one-eighth inches between the two cross-lines. Cut as shown in Fig. 5.

The mortises in the ties, Fig. 5, which are to receive their tenons are laid off by measuring from the shoulder at the end of the piece four inches and squaring a sharp pencil line across. Carry this line down on the two sides of the piece. From this line, lay off another at two inches, again at ten inches and then at two inches. There should remain four inches to the nearest shoulder.

Set the gauge to one and one-half inches and gauge between those lines which are two inches apart, gauging from the joint-edge. Both sides of each piece should be marked. Again, set the gauge to two and one-fourth inches and gauge from the joint edge.

The mortises, Fig. 5, in the tenons made on the shelf are to receive the keys. To lay them out, measure from the shoulder of the tenon one and one-sixteenth inches and square a light pencil line across the tenon. With the trysquare, carry this line around on the other side of the tenon. Now, measure from this line, measuring towards the end of the tenon, seven-eighths of an inch and square a line across on the top side only. On the under side, measure but three-quarters of an inch.

Find the middle of the tenon and measure three-eighths of an inch to each side. With the steel square placed so as to make a true perpendicular to the

cross-line which forms the shoulders of the tenons, pass lines through the two points just located.

The key can be made of three-quarters of an inch stock. Square up one edge and two ends, making a length of two and one-half inches, Fig. 6.

Firm one end, measure up seven-eighths of an inch and square a line across. Measure out from the jointed edge along this line three-quarters of an inch and place a point.

From the line just squared across the key, measure up three-quarters of an inch and square another line across. On this line, measure from the joint-edge seven-eighths of an inch. Through the two points thus located draw a line. Plane to this line.

Chamfer the corner at an angle of 45 degrees as shown in Fig. 6, the amount of chamfer being optional.

Fasten the top from its underside to the rails. Small angle irons such as can be found in any hardware store will serve.

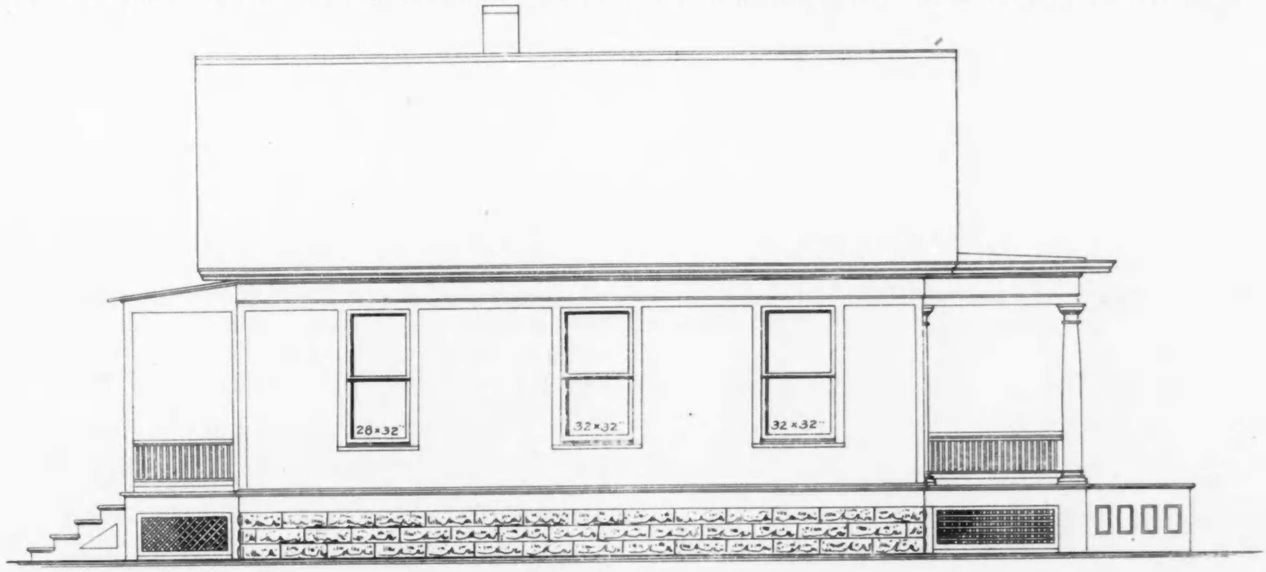
Finish by staining the color desired. Rub lightly, when dry, with fine sandpaper to remove the slight roughening of the wood caused by the stain. Apply paste filler of a color to match the stain. After the filler has thoroughly hardened, apply two or three coats of wax, rubbing well each coat.

If desired the ends of the table may be improved by the addition shown in the photograph. This table was built by a high school boy of Bloomington, Ill., under the supervision of Mr. T. L. Adams, supervisor of manual training.

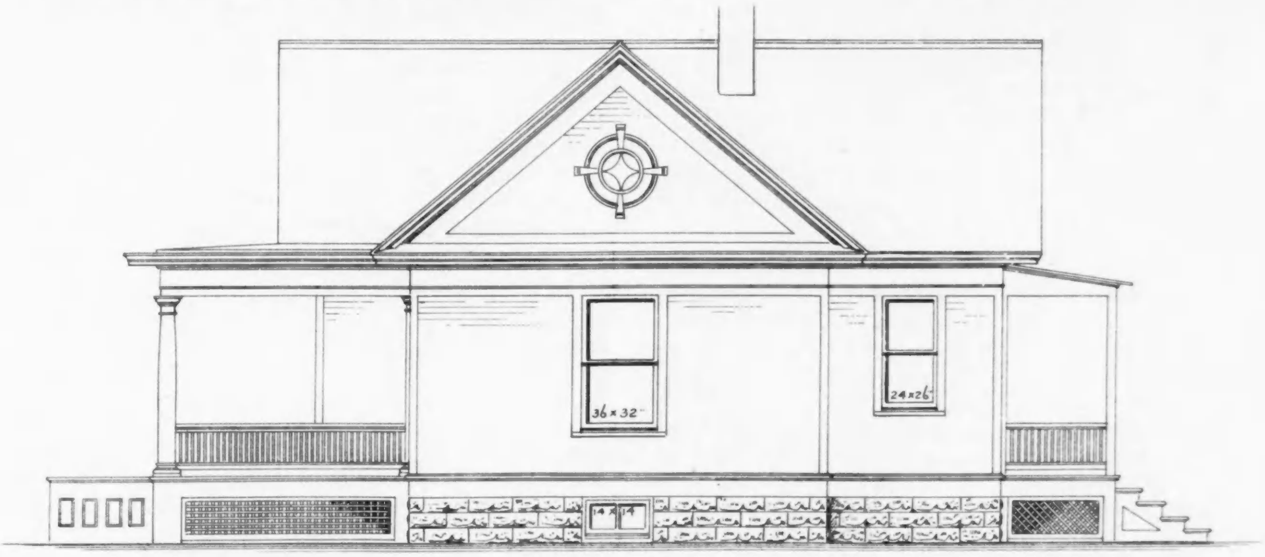
Drawing Lessons for the Carpenter

BY A. W. WOODS

FOR this lesson we show the side elevations of our subject. In our last, we gave the front elevation and the same rules given applies to these drawings. The main thing is to keep all parts to the same scale. However, in the reduction of these drawings, the scale is reduced from what it should be, but by looking at the basement plan, the dimensions of same are given in figures and the figures for the heights are given on the section, in connection with the front elevation. In reproducing these drawings, the scale should be not less than one-fourth of an inch to the foot. The student should study the drawings well to get the different parts fixed in the mind before trying to reproduce the same on paper. Remember that all parts are to the same scale—nothing in perspective—only one side is shown at a time. When the drawing board is large enough, two elevations can be drawn on one piece of paper.



LEFT SIDE ELEVATION.



RIGHT SIDE ELEVATION.

Correspondence

One Door an Hour is Unreasonable

To the Editor: North Liberty, Ind.

I have read both Mr. Stoddard's and Mr. Mummert's articles on hanging doors, and would like to make a few comments on the same. I fully agree with Mr. Stoddard in his idea with regard to hanging doors. But the idea of a man like Mr. Mummert saying that a man could hang, lock and fit ten to twenty doors per day, is enough to cause any carpenter to smile. I think if a man hangs, fits and puts mortise locks on five 1⅜-inch doors; or hangs two front doors and levels them, doing it in a workmanlike manner, he is doing an average day's work.

ABRAHAM SHENEMAN.

To the Editor: Pontiac, Ill.

The excellent article on hanging and fitting doors in the American Carpenter and Builder for December is worthy of careful study by every man in the trade, for I think that no one will deny that to fit, hang and lock a door so that it fits the jamb all round, yet swings clear, will shut snug yet not bind, will latch and lock easily yet not rattle, having the hinges set flush and smooth with the jamb, in short hanging the door just right, is about the neatest job pertaining to our trade.

A detailed description of my method, as compared with that described by Mr. Stoddard, would require too much space. His is a good one all through, and no carpenter can fail to be benefited by a thorough study of its every detail. Yet your correspondent from Alliance, Ohio, would knock such a method down and out with one stroke. In imagination we can see those doors put up by Mr. Mummert, and really think him a little too exact. He might cut out the five minutes and make it an even five hours to fit, hang and lock the eight doors. Yet each year shows more and more the necessity for a carpenter to know his work and use every means at hand to accomplish all that is possible, but to do our work well and finish up a job in a thorough workmanlike manner, requires careful painstaking effort and also considerable time.

J. A. GIBSON.

To the Editor: Louisville, Ohio.

Of late I noticed several articles in your valuable magazine on hanging doors. Your correspondent in the December number, I thought, was the most reasonable as to what he called a fair day's work for a man in that line. In your January number I noticed that an Alliance man felt himself under obligations to criticise Mr. Stoddard, claiming that a carpenter should be able to hang at least from eight to ten pine doors with mortise locks per day, to expect a full day's wages. He further says that one door per hour is just a snap for him, but when he said that he can put a mortise lock on a door complete in fifteen minutes that staggered me. Then to show what he actually could do he put his spurs on, got up on his hind feet, and put a mortise lock on a door in eleven minutes, and hung eight doors complete in five hours and five minutes, or thirty-eight minutes to a door. That time I felt like exclaiming "Is that so?"

I built my first house in 1859, and since that time I put up many buildings, and have employed all through that time about one hundred and fifty different men to help me. We have used about five thousand doors, and among all those men I had but one who actually hung twelve pine doors in one day of twelve hours, using rim and knob locks. Strange to say I ever afterwards put that man on other work, and had some of my slow men to hang doors. My idea is not how much, but how well the work is done.

J. SHENGLE.

To the Editor: Shelton, Nebr.

In your January number I noticed quite a misleading article in regard to hanging doors. The gentleman says he hung and locked eight doors in five hours and five minutes. I do not believe he can do it, and do a first-class job. Of course, I have seen a few persons who would hang a good many doors in one day; but it would take as much work to follow them up and refit them. With regard to putting on a mortise lock would say that the best way to find out how long it will take is to try it. He will find that it will take more than eleven minutes. I would not hire anyone to work for me that would tell me that he could hang more than four doors in a day.

LEWIS WOLVERTON.

To the Editor: Potomac, Md.

I read the article in your December issue by D. L. Stoddard on fitting and hanging doors, and will say that I think that he is estimating a fair day's work for a carpenter when he says four good sized doors are a day's work. I also read the article of the gentleman from Alliance, Ohio, in which he says a first-class carpenter should fit, hang and lock one door every hour. Now, my experience is that first-class workmen will not do as much work in a day as rough workmen, or as we call them "barn carpenters," for the simple reason that first-class workmen do their work as it should be done, while the others simply work at it. With me, six doors complete are a day's work. I am like the old millwright mentioned by Mr. Stoddard, I have money that says nine-twelfths of the men who claim to put in nine to twelve doors complete in a day cannot fit, hang and lock one complete.

GEO. C. MYERS.

To the Editor: Centralia, Ill.

After reading Mr. Mummert's article on hanging doors in your January issue I felt so small I could have crawled through the crack that Mr. Mummert left between the door and the jamb, when he hung those eight doors in five hours and five minutes. But giving the thing a second thought I came back to normal size and decided (which I think is not far from right) that Mr. Mummert is an undiscovered humorist, and bids fair to outrival Mark Twain, for I do not consider that the gentleman wishes to be taken seriously. I have seen many doors hung on the eight in five hour and five minutes style, some of which fitted so well they would not shut, others would hardly keep the cats out. My experience is that a man who hangs and locks four or five ordinary doors in a day of eight hours, and does it right, does a good day's work, and earns his wages. A. C. SCHNAKE.

To the Editor: London, Ont.

I read an article in the January number of the American Carpenter and Builder by C. C. Mummert, of Alliance, Ohio, on hanging doors. In all my experience of thirty-two years I have not run across a man like Mr. Mummert. We hear lots of talk but it is facts we want. I have not had one man working for me who could hang and fit nine doors in nine hours. When we write for the good of our brother chips let us keep to facts. THOS. R. WRIGHT.

To the Editor: Grand Rapids, Mich.

I have read the articles in your December and January numbers about hanging doors, but the letter from C. C. Mummert takes the cake. I am a man over fifty years of age, and in all my experience I have never seen a workman who could compete with this man from Ohio.

H. M. BERNARD.

To the Editor: Trenton, Ont.

I read an article in the American Carpenter and Builder in January from your Ohio correspondent, in which he claims to be an expert in hanging and fitting doors. He said he was not boasting when he said he could fit, hang and lock one door per hour for ten hours. When a man talks like that I doubt very much if he can hang one at all. I think when a man puts up from four to seven doors in ten hours, and has them work properly, he does a fair day's work.

J. F. WALSH.

To the Editor: Hinton, W. Va.

In the December number of the American Carpenter and Builder I saw an article where it stated "A man could not fit, hang and lock more than three doors in a day and do it well." I told my contractor about it, but he was of the same opinion as Mr. C. C. Mummert, whose idea was given in the January number, so we agreed to give it a practical test, and as we were finishing up a large office building, we decided that that would be a good place to do so. There were fifty-six doors, three by seven feet and one and three-eighths inches thick, all mortise locked. The very best we could do was to fit, hang and mortise lock three doors in nine hours, and I am not boasting in any way at all, but I challenge any man to do a better and quicker job in the same time. I placed the bottom hinge twelve inches from the floor and the top hinge ten inches from the top of the header.

I have done lots of work and a man who fits and puts up three doors in ten hours has pleased me as well as the man to whom the property belongs. In putting on mortise locks, I wish to state that a good many carpenters use three-fourths-inch bit when a half-inch bit is all that is necessary. They all bore and cut the mortise and the lock will be too small. The lock must fit the mortise tight and should be driven in with a mallet, so that it will join at the top and bottom. It will then be held more secure than it would be by simply having the tension screws alone.

H. B. HOUCHINS.

How to Make Slap-Dash

To the Editor: Gloucester, Mass.

Could you inform me how to make Slap-Dash mixture for outside plastering—three coats? FORREST C. NORWOOD.

Answer: "Slap Dash" coating or plastering is a name used in Arkansas, and it is known to the trade generally as stucco work, or outside plastering with Portland cement—the three coat work being the rough or rustic coat finish and is made as follows: First coat, one part Portland cement and three parts sand, applied with a plasterer's trowel. Before it has hardened a second coat of the same proportions should be applied in the same manner, and floated for the purpose of obtaining a flat, even surface, free from depressions and bulges. Before this has hardened apply the third coat, which consists of one part Portland cement, one and one-half parts sand and two parts clean washed gravel or crushed stone, about one-half inch in diameter. This is applied with a mason's trowel by taking a small amount on the trowel at a time and hurling it on the wall with force, being careful to prevent the trowel from striking the surface. The name "Slap-Dash" originated from this last coat.

FRED W. HAGLOCH.

Length of Hip Rafter

To the Editor: New Boston, Mo.

Will you explain how to get the length of a hip rafter for a half pitch roof for a building seventeen feet seven inches wide, making eight feet nine and one-half inches in the run?

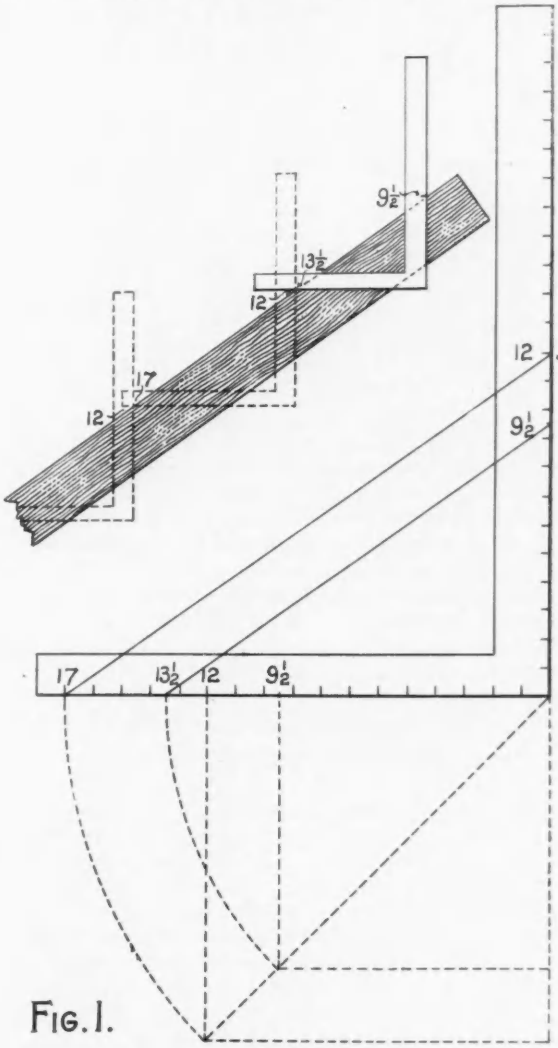


FIG. I.

I take 17 and 12 on the square eight times for the eight feet in the run. What I want to know is how to get the nine and one-half inches. Also how to get a valley rafter for a gable of half pitch to fit over another of three-eighths pitch.

A. J. MOORE.

Answer: The reason 17 is used is because it is the practical length of the diagonal of a one-foot square, and 12 is used because it represents the half pitch to a one-foot run as shown in Fig. 1. Therefore these figures taken on the steel square eight times will give the length for the eight feet in the run, and for the nine and one-half inches proceed in the same way taking the diagonal of nine and one-half inches, which is thirteen and one-half, and a line drawn from 13½

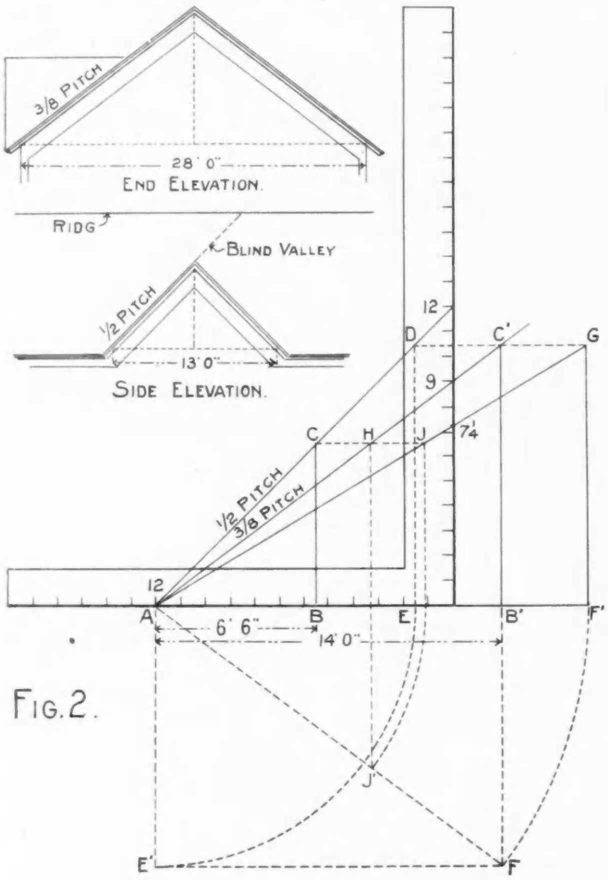


FIG. 2.

parallel with the one from 17 to 12, and the point of intersection on the blade will be the figures to use for the last application of the steel square to obtain the length for the extra nine and one-half inches in the run. In the case of the half pitch, the rise being equal to the run the figures on the blade are the same as those in the run. This should not be allowed to confuse, as it does not occur in any other pitch. To

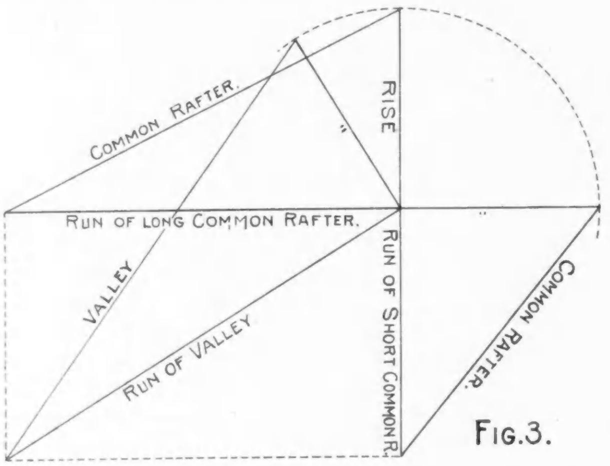


FIG. 3.

get the length of valley you wish; first lay off the pitches 12 to 12 and 12 to 9 as shown in Fig. 2. Now assuming that the run for the half pitch is six feet six inches and that for the three-eighths pitch is fourteen feet we lay off these lengths on the run as shown at A B and A B′. Square up from B and B′ to the respective pitches intersecting at C and C′. Then A C will be the length per one inch scale for the common rafter for the half pitch, and A C′ will be the same for the three-eighths pitch. Now for the length of the valley, square over from C′ to D and drop to E on the run, and this transferred to A E′ represents the end and A B′, the side of a plan whose diagonal A F will represent the run for the long valley to catch the ridge of the main gable, and this transferred to F′ and erect the rise F′ G, and draw the line A G which will be the length of the long valley, and by squaring over from B C intersecting A G at J. Thus A J will be the length for the short valley and its run will be A J. The point at H is at the intersection of the ridge of the half pitch with the main roof. J G represents that part of the long valley commonly called blind valley. I trust the elevations in connection with this illustration will make the subject clear. Where the roofs of different pitches are of the same height it is quite an easy matter to arrive at the length of the valley as their runs form the sides of the plan as shown in Fig. 3, which needs no further explanation.

A. W. WOODS.

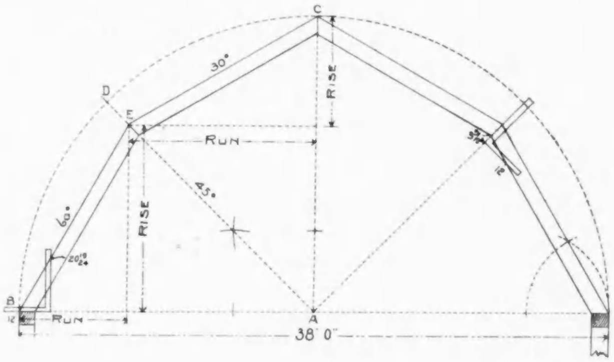
Framing a Gambrel Roof

To the Editor: Brazean, Mo.

Would like to know through the columns of your journal in what proportion to frame a gambrel roof building 38 feet in width and be self supporting, how high would you make the knuckle joint to be in proportion with the width of the building?

E. C. SPRIGGS.

Answer: In answering this question we refer to the



answer and illustration to Mr. Simpson's question, as we would recommend the same treatment in supporting the roof. However, we show in the accompanying illustration a gambrel roof. In this, the pitches are the same as in the roof referred to, but the knuckle is placed at the half-way point between the plate and the comb, thus making both sets of the rafters the same length and cuts. A roof of this proportion can very easily be laid out with the compass alone, as shown by the diagram. A, B represents the total run; A, C the total rise; and are the same as in the half-pitched roof. 12 and 20 19/24 will give the seat and plumb cuts, while 12 and 3 5/24 will give the cut at the knuckle.

EDITOR.

Paint for Shingle Roof

To the Editor: Batavia, N. Y.

I desire some information about a roof on a dwelling house that has been causing me much trouble. Eight years ago the house was shingled with red cedar, and ever since the rain water has been unfit to use. What remedy would you suggest? Would staining or painting do any good, or is it necessary to put on a new roof?

GEO. J. GLADE.

Answer: Red cedar contains an oil which will give a taste to the water, no matter how long the shingles may be exposed to the weather. I cannot recommend the use of any paint containing white lead, since this will in time powder off and the particles of lead will be carried down with the water, and cause lead poisoning to those drinking it. A paint made from pure zinc white and linseed oil would be non-poisonous, but would be apt to peel off. In Bermuda roofs are covered with whitewash, which does not harm the water for drinking purposes. This, or one of the cold water paints intended for outside use, might be tried, or if a greater expense would not be objectionable, two coats of the best quality of spar varnish might be given to the roof.

EDWARD HURST BROWN.

Making an Equalization Table

To the Editor: Wilmington, Ohio.

Will you please tell me how to make an equalization table for a hand machine. The cut-off saw is to be stationary.

HARLEY CARTER.

Answer: There are two general plans for making equalizer tables where the cross-cut saw is stationary. One is to have a table moving on ways or tracks, and the other is to have a swinging rack for carrying the stock. If it is to be used for handles and other similar pieces exclusively, the swinging rack idea probably is the best, as it can be made lighter of movement, which is a very important item in handling light work. However, if you have other stock to cross cut on the same rig, it will probably be best to pattern after some of the regular table or bench cross cut. If you make a swinging rack for your stock you may swing it either above or below to suit your local conditions. Equalizer rigs, as a rule, have the racks swung from below and so arranged either by hanging or by counter-weights or springs that the rack will return from the cut itself. As for the details of construction, use your own ingenuity in connection with the facilities for handling.

J. CROW TAYLOR.

·PRACTICAL·TRADE·APPLIANCES·

New Industry for Cleveland

The Runyan Concrete Machinery Co. of Cleveland, O., capital $150,000, has been incorporated in Columbus.

It is proposed by the company to invest $100,000 in the plant proper, which will be the parent concern for a whole series of factories to be established throughout the state, the surrounding states and Canada for the purpose of utilizing the machines in the actual manufacture of concrete blocks of all kinds for building. The new machine is the invention of Mr. Runyan and in perfecting it he has spent the past three years.

Prize-Winners in Bradt Contest

The prize contest recently conducted by the Bradt Publishing Company, of Jackson, Mich., was very successful. The company offered four prizes to the purchasers of their book, "The Lightning Estimator," for the best letters regarding the book. The prize winners were: George W. Harman, Chula, Mo., $5.00 in cash; H. H. Mount, Pasadena, Cal., second; C. L. Dixon, Renault, Ill., third; and F. E. Martin, South Sharon, Pa., fourth. The latter three each received a paid-up subscription for one year to the AMERICAN CARPENTER AND BUILDER.

Monolith Concrete Form

The Monolith Concrete Form makes a permanent, continuous, reinforced hollow or solid wall for use in building foundations, dwellings, factories, docks, retaining walls, partitions, silos, bins, elevators, chimneys, etc. Among the advantages detailed by the inventor of this device are: They require no skilled labor; they make a jointless, solid or hollow wall of any dimension; they can be easily and quickly set up; they give a straight and strong wall; they require no obstructive bracing; they save from 40 to 50 per cent of material when made hollow, retaining the strength of a solid wall; they produce a wall of any thickness; they make angles at any degree; they allow the use of large aggregates, giving a stronger and water-tight wall.

It is claimed for the Monolith Concrete Form also that the device prevents the use of an immense lot of expensive lumber; they secure easy and solid walling of joist; they can be easily reinforced, whether solid or hollow; they reduce the weight of the wall and facilitate the drying of material when made hollow; they do not require the expense of a plant to manufacture a finished product; they require no cartage of a finished product, and they are cheaper and more durable than any other building material.

The Monolith Concrete Construction Co., manufacturers and patentees, Hathaway Building, Milwaukee, Wis., will be pleased to furnish detailed information to such of our readers as are interested in concrete block machinery.

Plans for Concrete Houses

E. Wittekind, 28 East Jackson Boulevard, Chicago, advertises in this issue that he has his new book of concrete block houses ready to send out. This volume contains handsome illustrations of exteriors, description, floor plans, estimated cost, etc. It has many designs for artistic modern homes and is invaluable for home builders. He states that every plan is original, artistic and practical.

Band Saw Filing Machine

This machine which may be used either on a bench or pedestal, is adapted for automatically filing small band-saws, ranging in size up to and including saws with teeth one-half-inch from tooth point to tooth point and one and one-half-inch width of blade. The vise which carries the saw is clamped together by spring pressure sufficient to hold the saw firmly, yet allowing it to be slipped through as each tooth is filed. At each revolution of the file shaft, the file is automatically withdrawn from engagement with a tooth, dropped back, and just as the smooth portion of its circumference reaches the saw, it shoves the saw along for the next tooth. The amount of this movement is regulated according to the size of the saw tooth by a thumb screw.

The file is controlled by cams to only cut a certain depth each time, and this feature, always insures accurate and even teeth.

The construction of the vise makes it possible for a thick weld, and in fact almost anything but a break to pass through the vise without stopping the machinery or injuring a tooth.

This machine will save three-fourths or more of the time of hand filing, because it is entirely automatic, and only requires the time necessary to put in a saw and start the machine. If the saw, through negligence is left in until it has passed the starting point, no harm is done. Any boy can learn to put the saw in in a few trials.

The Rotary File & Machine Co., of 579 Kent avenue, Brooklyn, N. Y., will be pleased to send further particulars to the readers of the American Carpenter and Builder if they will write for them.

Fans for Heating and Ventilating

Fans, blowers and exhausters for heating and ventilating, mechanical draft and other purposes are described in a booklet issued by the Green Fuel Economizer Co. of Matteawan, N. Y. They have recently added large shops to their plant at Matteawan to handle this branch of the business. They do not contract for the engineering of plants, nor for the installments of heating and ventilating plants in competition with the heating and ventilating contractors.

A Standard Expansion Bolt

The Star Expansion Bolt Company are sending out to the trade their latest catalogue. It is very complete and describes fully the large line of their specialties. In offering this catalogue they especially impress upon the recipient the fact that the Star Expansion Bolt, both lag screw and machine bolt types, are standard and are the kind used by the government and by most of the large builders, plumbers, electrical concerns, telephone companies, fire door manufacturers and the like.

For users of expansion bolts the Star has a distinct advantage, as the holes required for their insertion, the company asserts, are smaller than for any other style and there are no superfluous parts to become lost or broken, either before or after insertion; both the lag screw and machine bolt types are the standard of strength and utility.

The Star Expansion Bolt Company will be pleased to send this catalogue to any of our readers upon request. See their advertisement on another page of this issue.

Situation Wanted

A carpenter, 23 years of age, would like to secure work for the coming season in one of the western states, preferably Montana, Washington or North Dakota. A good man at general construction. Address P. S., care of American Carpenter and Builder.

Up-To-Date Ideas in Screens

The use of full-length window screens is becoming more common than it formerly was. Such screens protect the glass from hail and make it possible to raise or lower either sash without admitting flies. If these screens are fastened in place with turn-buttons, hooks, screws or ordinary hinges a considerable amount of work is involved in putting them in place and removing them in the spring and fall or when the windows are to be washed. In this issue appears the advertisement of the F. D. Kees Mfg. Co., Beatrice, Neb., illustrating Gossett's Suspension Hinges, which are used extensively for hanging screens and storm windows. No tools are necessary in placing or removing a screen so attached and on upper stories this can be done without the use of a ladder

Johnson's Wood Dye

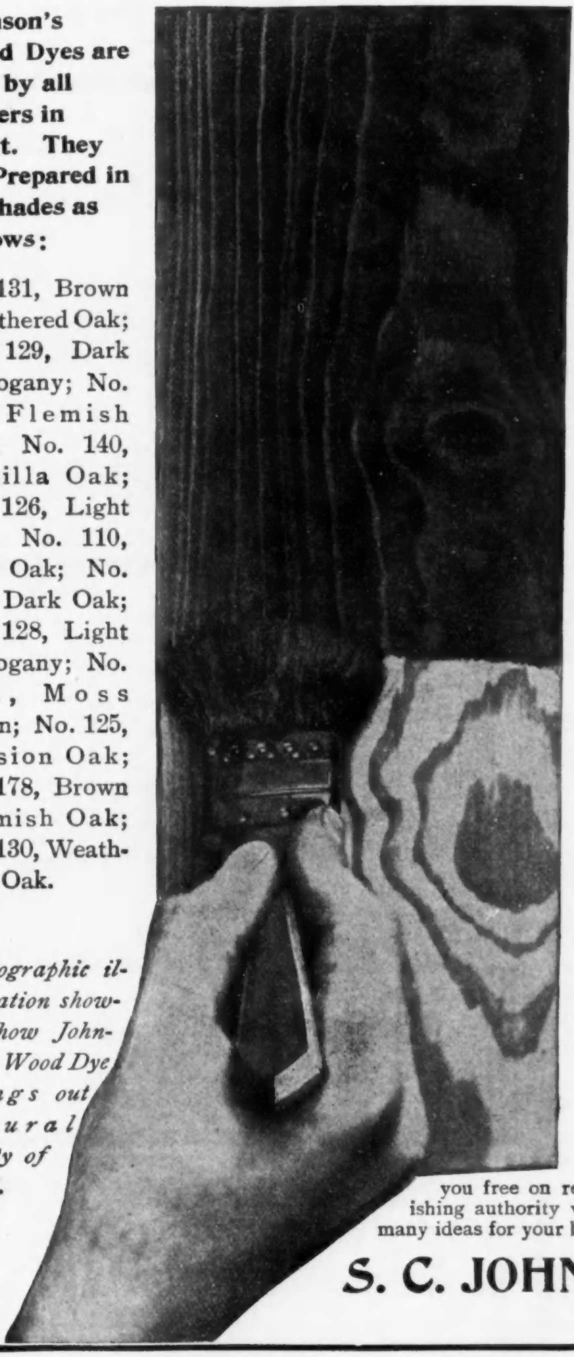
"For the Artistic Coloring of Woods."

Johnson's Wood Dye is the result of years of experimentation. Because of its acknowledged superiority it has met with wonderful sale. Don't confound Johnson's Wood Dye with various "stains" now on sale. Water "stains" and spirit "stains" raise the grain of the wood. Oil "stains" do not sink deep into the wood, nor do they bring out the beauty of the grain. Varnish stains do not properly color the wood—the color being only in the finish. When varnish finish is marred or scratched it shows the natural color of wood—revealing the sham. Johnson's Dye is a dye. It penetrates the wood; does not raise the grain; retains the high lights and brings out the beauty of the wood. Johnson's Dye is the best for use on floors, interior woodwork and furniture.

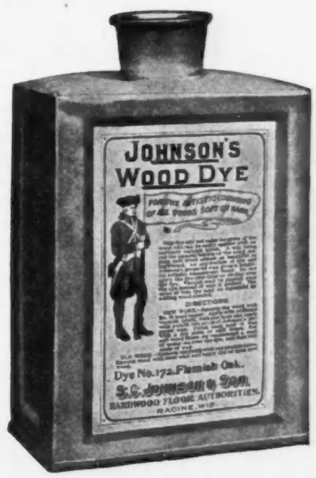
Don't buy "stains'' but be sure to get the genuine Johnson's Dyes if you desire best results. Don't take a substitute.

Johnson's Wood Dyes are Sold by all Dealers in Paint. They are Prepared in all Shades as Follows:

No. 131, Brown Weathered Oak; No. 129, Dark Mahogany; No. 172, Flemish Oak; No. 140, Manilla Oak; No. 126, Light Oak; No. 110, Bog Oak; No. 123, Dark Oak; No. 128, Light Mahogany; No. 121, Moss Green; No. 125, Mission Oak; No. 178, Brown Flemish Oak; No. 130, Weathered Oak.



Photographic illustration showing how Johnson's Wood Dye brings out natural beauty of wood.



One-half pint cans	. .	**30 cents**
Pint cans	. . . . .	**50 cents**
Quart cans	. . . .	**85 cents**
Gallon cans	. . . .	**$3.00**

One gallon covers 700 square feet upon hardwood, 400 square feet upon soft wood. It is very easily applied with an ordinary paint brush.

Special FREE Offer. We will send you a sample any shade, absolutely free for your paint dealer's name.

Send for FREE Book. We have just published a new edition of the interesting, practical book, "The Proper Treatment for Floors, Woodwork and Furniture," that we will send you free on request. It is illustrated from life and written by a wood finishing authority with over 23 years experience in this line of work. Contains many ideas for your business. Write us now. Mention edition ACB 3.

S. C. JOHNSON & SON, Racine, Wis.

"The Wood-Finishing Authorities."

from within the building. Screens and storm windows can be made interchangeable and either can be opened at the bottom if desired. These hinges are sold by a great many hardware dealers and screen manufacturers. Liberal prices are quoted to contractors and builders and the firm named wishes to send a sample pair to anyone who is interested. A postal card will bring it, if the writer states he saw their advertisement in this magazine.

Sewer Pipe and Drain Tile Molds

The Miracle Pressed Stone Co. of Minneapolis, have made the manufacture of cement sewer pipe and drain tile a more practical proposition than it has ever been before. They have not only reduced the cost by a large percentage, but have made it possible to engage in the manufacture with a comparatively small investment. This has been accomplished by the perfection of their improved molds.

Heretofore it has seldom been possible and never practical to make tile and remove the molds for several hours after tamping. This necessarily advanced the cost of each tile beyond reasonable reach, and called for additional capital for buying many extra molds in order that the laborers might be kept busy, and a fairly good quantity of tile made each day. With the Miracle molds it is different. Their mechanism is such that the tile can be made much quicker than ever before, and the shells can be released and removed immediately after tamping. Thus cost is minimized, and the necessary investment greatly reduced, owing to special mechanism. One mold can be kept busy all the time. Both the inner and outer shells contract and expand respectively without the slightest jar to the fresh tamped tile. By special lifting bars, they are easily and safely taken away and used for making another tile.

The Miracle Pressed Stone Co. have obtained a patent on the molds, which bid fair to revolutionize the manufacture of sewer pipe and drain tile—both clay and cement. Their special bell-end attachment has equal merits, and like the mold proper, must only be seen to be appreciated.

The Hercules Drew the Crowds

At the Cement Users' convention in Milwaukee in January, the Hercules Cement Stone Machine was a star performer. Cement men had to see the blocks, cornices, lintels, etc., made right before their eyes before they would believe that a simply constructed machine like the Hercules could turn out such a wonderful variety of shapes and sizes. They saw a machine so simple in construction that not a cog, a chain, a spring, a bolt nor a pin entered into its make-up. Skilled labor is not required with a Hercules, for the machine is so simple that any man with ordinary intelligence can operate it.

The Hercules, by a clever combination, can make two stones of the same size and design, or of different size and design, at one time; an arrangement that cuts the cost of labor in two, doubles the capacity of the manufacturer and saves the cost of purchasing two machines. Tamping is done directly on the face, which means a clear impression of the design, and gives the stone a more natural appearance. Tamping on the face allows a two to one composition for facing and five to one for backing, which means a great saving. It also allows the making of the mixture more wet, which means a stronger stone.

The Century Cement Machine Co. has just issued a handsome new catalogue explaining all about the 1906 Model Hercules, and illustrating factories, churches, residences and apartment houses, built by Hercules Machine-made stone, which they will send to you free upon request. Address the Century Cement Machine Co., 273 West Main street, Rochester, N. Y.

I Always Specify "Schroeder's"

WHETHER preparing plans for mansion or cottage, I always include in my specifications

"Steel-Polished Perfection"

The Modern Hardwood Flooring

because I know it is best for my client. It is thoroughly steamed and kiln-dried, always works in smoothly and presents a rich, polished surface.

Then, too, I run no chances of losing the good will of my customer, as has been the experience of many architects who have permitted ordinary flooring to be used—the kind so liable to shrink.

And, best of all, this superior flooring fits so easily and perfectly that the money saved in the laying makes the ultimate cost unquestionably less than that of the seemingly cheap but unsatisfactory products of ordinary planing mills.

Made only by
JOHN SCHROEDER LUMBER CO.,
Milwaukee

INTERNATIONAL CORRESPONDENCE SCHOOLS
Box 910, SCRANTON, PA.

Please send me your booklet, "1001 Stories of Success," and explain, without obligation on my part, how I can qualify for a higher salary in the position before which I have marked X.

Architect	Surveyor
Structural Engineer	Mining Engineer
Building Inspector	Sanitary Engineer
Architectural Drafts.	Chemist
Contractor & Build.	Ornamental Designer
Foreman Plumber	Navigator
Foreman Patt'm'k'r	Bookkeeper
Mechanical Engineer	Stenographer
Mech. Draftsman	Show-Card Writer
Electrical Engineer	Ad Writer
Electrician	French } With
Steam Engineer	German } Edison
Marine Engineer	Spanish } Phon'gr'ph
Civil Engineer	Commercial Law

Name ____________

St. & No. ____________

City ____________ State ____________

The Pass To a Larger Salary

A coupon like the above has proved the pass to a larger salary, a better position, and increased happiness and prosperity to over 100,000 people, who are living proofs that we can do all we say.

If YOU want to better yourself, the I. C. S. can and will help you, no matter how poor your circumstances are; how scant your education may be. No time lost from your present work. No books to buy. If you realize the worth of this coupon, mark it and mail it to the Schools. It puts you under no obligation to do this. It is simply a free way to find out how to make a success of your life.

SEND FOR OUR CATALOG "HOME HEATING"

HOT-WATER HEATED $198 EACH by ANDREWS SYSTEM

UNITED STATES — ALASKA

14 ANDREWS HEATERS IN ONE BLOCK — AVERAGE PRICE $198.00

IT IS WELL WORTH READING

CANADA — NEW FOUNDLAND

Free Building Plans. Build your houses from our complete plans, specifications and details furnished to you free if your customer heats the building with the Andrews System. Your customers can select from the Andrews Architectural Book of Plans the plan he likes best and you need spend no time looking up sketches to interest him or getting his ideas. The book illustrates houses costing from $1,200 to $8,500, including Colonial and English half timber effects of most artistic and practical designs. It is printed on heavy enamelled paper illustrated with vignetted half tones. The cost of the Andrews System is printed under each house. Send ten cents and names and addresses of five people who are going to build or buy heating plants and we will send the book prepaid.

Prices. We will sell you the plant with all material complete, pipe cut to fit so you can erect it yourself. The cost of each heating plant here shown is based on Minnesota climate and includes an Andrews Steel Boiler, richly ornamented radiators, for every room except the kitchen, pipe cut to fit, fittings, valves, gold bronze, brushes and all other material ready for use with diagrams and directions so plain and simple that any man handy with tools can erect the plant and save money. You can in this way include the heating plant in your general contract for the building

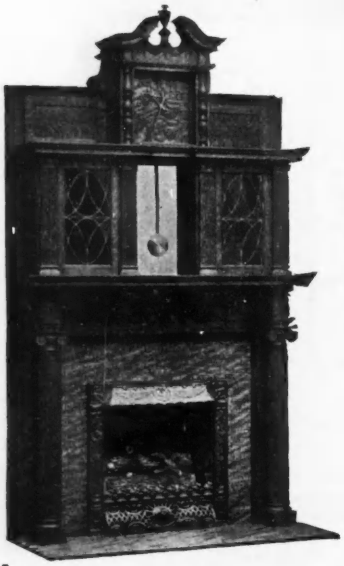
Factory to User. We design, manufacture, guarantee and sell each plant direct from Factory to User, giving you the lowest price for the value. Estimates free. If you are going to buy a heating plant of any kind SEND FOR OUR CATALOG which explains fully how you can erect our plant in any building and save plumbers' charges. Send your address and the names and addresses of two other people who expect to buy heating plants and we will send our catalog post paid

We Do It Right in 44 States, Canada and Alaska. Send for a list of our customers in your vicinity and examine their plants. We have had 18 years experience in the COLD NORTHWEST.

All Plants Guaranteed and Sold on 360 Days' Trial Free. Freight rates equalized. Send the names of others who are going to buy heating plants and get our catalogue and full particulars.

ANDREWS HEATING CO.,
72 La Salle Bldg., Chicago
372 Hennepin Ave., Minneapolis

MANUFACTURERS CONTRACTORS CONSULTING ENGINEERS



IF YOU ARE BUILDING A NEW HOUSE YOU OUGHT TO HAVE OUR CATALOGUE OF

BEAUTIFUL MANTELS

It contains a great variety of designs in a wide range of prices. You will find we can sell you an elegant Mantel for very little money. Tell us what you want and we will name you a price that will merit your order.

Tiles and Fireplace Goods

OF EVERY DESCRIPTION

Write to-day for our 40 page Catalogue

IT'S FREE!

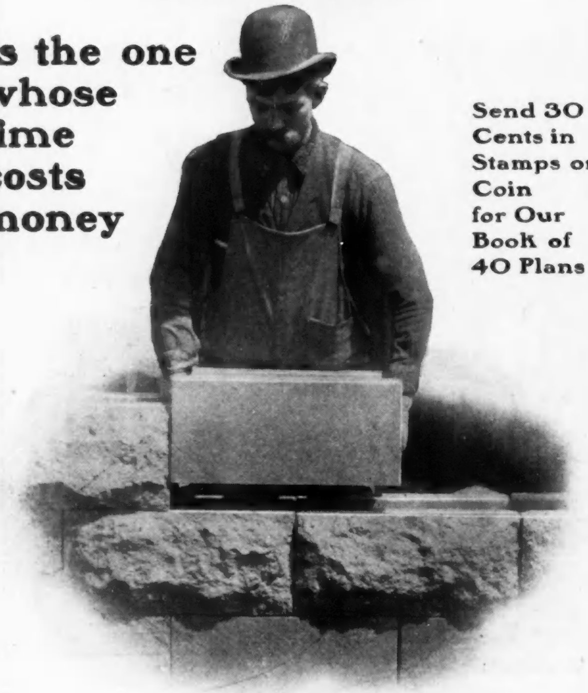
THE A. W. BURRITT CO., - BRIDGEPORT, CONN.

"THE MANTEL FOLKS"

ADDRESS DEPT. M

The Man on the Scaffold

Is the one whose time costs money



Send 30 Cents in Stamps or Coin for Our Book of 40 Plans

THE DYKEMA WAY

To economize his time (the mason's) means to gain advantage in Hollow Cement Stone Construction. There is no great saving in the cost of the stone on the ground, compared with brick, but there is a large saving in the laying cost if the method of stone making is right.

But—you can't use the mason's time economically if he has to lay every stone two or three times, or if he spends his time in cutting, chipping and fitting. **His time must be spent in "laying stone."** The stone brought to him must be so shaped that he can handle them easily, without breaking his back or pinching his fingers, and so that they can be placed in their permanent position with one movement.

There must be a variety of sizes, so that when he needs a stone ½ inch 1 inch, or 1½ inches, or any other odd size shorter or longer than the regular size it must be possible to supply it to him.

You can't afford to use a 50 cent time in making stone fit when it can be done **in the stone yard for one-third the cost**, to say nothing of the appearance.

The Architect Must be Considered—he won't draw plans to fit your stone. You must be able to supply the stone called for in the plans—to give them variety in size, form and color, at low cost to you.

Dykema stone are the proper shape to lay easily—a sufficient number of lengths can be made so that cutting and chipping are unnecessary. The DYKEMA SYSTEM increases the capacity of the mason 50 per cent. Think of it when you buy.

Dykema Stone please the architect and satisfy the customer.

We have the wet process molds and dry process machines, all of which make a correct shape stone. Send for our book about them.

Also send for our booklet about our brick machine—the quickest on the market.

THE DYKEMA COMPANY

2636 Pearl St.
GRAND RAPIDS, MICH.

The Back Breaking, Finger Pinching Kind, that Costs Money to Lay

A MIXER IS KNOWN BY THE MIXTURE IT MIXES

The American Mixer's reputation rests upon this fact. It **mixes.**

THE REASON

Revolving steel plow blades do the mixing. They revolve from twelve to fifteen times per minute and with each revolution four complete mixes of the batch have taken place. This means that a charge left in the machine for one minute is mixed from 48 to 60 times.

THE AMERICAN MIXER

Is easily controlled and is an economical and durable machine. It feeds while running, discharges instantly, is self-cleaning and never clogs. It does not "ball" nor "roll" the material. Send for Catalogue "O."

THE INTERNATIONAL F. & FIREPROOFING CO.,
Columbus, O.

THE DUNN MACHINE

WITH

Mason's and Builder's Equipment

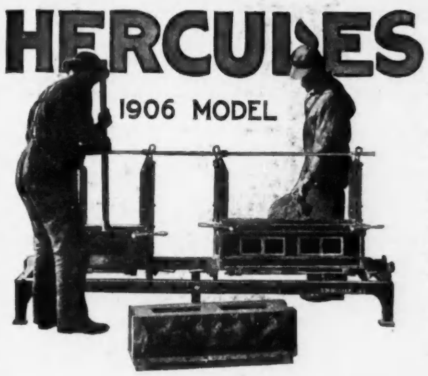
PATENTED

A Machine that makes 300 perfect blocks per day.
Adjustable Cores, and all parts interchangeable.
Makes blocks from 2 to 12 inches in width up to 20 inches long and in different designs.
No expensive iron pallets required. All blocks made on the one size wood pallet.

PRICE $35.00

No machine at any price makes better blocks, or makes them more rapidly or economically. Write for catalog.

W. E. DUNN & CO.
Sole Manufacturers
353 West Fullerton Ave. Chicago, Ill.



The Hercules Drew the Crowds

At the Cement Users' Convention in Milwaukee in January the Hercules Cement Stone Machine was the Star Performer.

Cement men had to see the Blocks, Ornaments, Cornices, Lintels, etc., made right before their eyes before they would believe that a simply constructed machine like the Hercules could turn out such a wonderful variety of shapes and sizes.

They were astonished—they were amazed, and no wonder. They saw a machine so simple in construction that not a cog, a chain, a spring, a bolt nor a pin entered into its make-up.

They saw the adjustments so easily and quickly made, that many who had heretofore been prejudiced in favor of other machines freely admitted that the Hercules had them all beat from every point of view.

Skilled labor is not required with a Hercules, for the machine is so simple that any man with ordinary intelligence can operate it.

The Hercules, by a clever combination, can make two stones of the same size and design, or of different size and design, at one time; an arrangement that cuts the cost of labor in two, doubles the capacity of the manufacturer and saves the cost of purchasing two machines. Tamping is done directly on the face, which means a clear impression of the design, and gives the stone a more natural appearance.

Tamping on the face allows a 2 to 1 Composition for facing, and 5 to 1 for backing, which means a great saving. It also allows the making of the mixture more wet, which means a stronger stone.

The Hercules will produce more stone and stronger stone in much less time and for much less money than any other machine.

We have just issued a handsome New Catalog explaining all about the 1906 Model Hercules, and illustrating Factories, Churches Residences and Apartment Houses built by Hercules Machine Made Stone, which we will send to you free upon request.

No other machine can make this variety

ASK FOR CATALOG XX

THE CENTURY CEMENT MACHINE CO., 273 W. Main Street, ROCHESTER, N. Y.

CONCRETE BLOCK HOUSES

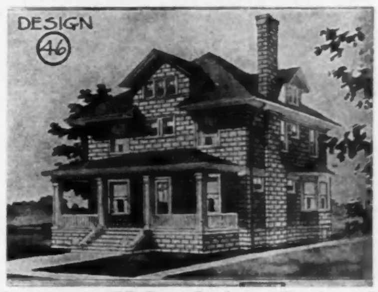
My new book of Concrete Block Houses contains handsome illustrations of exteriors, description, floor plans, estimate cost, etc., of many designs for artistic modern homes. INVALUABLE FOR HOME BUILDERS. Every plan original, artistic and practical.

PRICE OF BOOK $1.00, POSTPAID.

I also have Portfolio of modern and artistic homes in frame, brick and plaster construction.

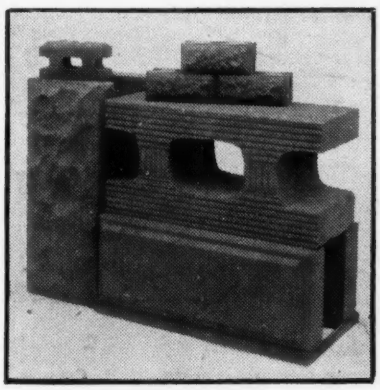
PRICE OF PORTFOLIO $1.00, POSTPAID.

COMPLETE WORKING DRAWINGS, details and specifications of any design will be furnished at moderate cost.



H. WITTEKIND, Architect

Department A. —— 28 East Jackson Boulevard CHICAGO, ILLINOIS



"THE WONDER OF THE AGE"

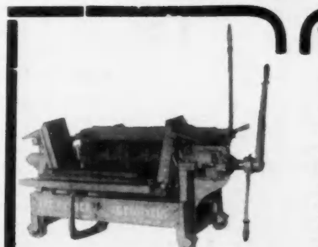
The Keystone is a face-down machine and has proven itself to have a larger capacity and produces neater work than any other machine on the market. A postal will bring you full particulars and valuable information. Address the

Keystone Cement Block Machine Co.

PHOENIXVILLE, PA.

HAYDEN

THE HAYDEN AUTOMATIC BLOCK MACHINE



Has been proved to be the simplest, most complete and swiftest machine on the market. The Highest Award at the Louisiana Purchase Exposition backs this statement. This face down machine is the only one that can be put to so many different uses and do absolutely satisfactory work in every one. It makes possible a great diversity of designs, and the product is impervious to moisture. Blocks released and delivered automatically. Send for Catalog "M."

THE HAYDEN AUTOMATIC BLOCK MACHINE CO., COLUMBUS, O.

New York and Foreign Office: Hayden Automatic Equipment Co., 26 Cortland Street, New York City.

Granilite manufactured by the McClenahan process

CONTRACTORS and builders are amazed at the perfection of this product. Highly approved by architects everywhere.

DURABILITY UNQUESTIONED ***LESS ABSORBENT THAN NATURAL STONE***

ABSOLUTELY FIRE-PROOF

Every detail of architect fully carried out. **Our Licensees are not compelled to compete with the owners of $25.00 hollow block molds.** Parties with capital should write for illustrated catalogue.

STANDARD STONE CO. OF AMERICA (Sole owners of McClenahan patents) **No. 1 Madison Ave., New York City**

The "Runyan"

Is the only machine that will make concrete building blocks of any description, pavement blocks, window and door caps and sills, BRICK and curbing. The only combination brick and block machine ever invented.
One movement of the lever through an arc of 55 degrees, forms the mould and places the cores in position; a reversed motion will release the mould and remove the cores; less than a second's time required; A CHILD CAN DO IT. Cheapest machine on the market, capacity considered.

C. M. RUNYAN & CO.
ELYRIA, OHIO

Strong, Simple, Durable
Capacity limited only by what can be fed into it. It's doing business all the time. Operated by 3 H. P. gasoline engine, the entire machine when equipped weighs but 1,700 lbs.

The GRANT
The Mixer that Mixes
DryConcrete, for it is not a revolving drum or cube

It has the dry and wet mix of our famous CONNOLLY and, of its character, is the lowest priced concrete, cement and mortar mixer equipped with power on the market.

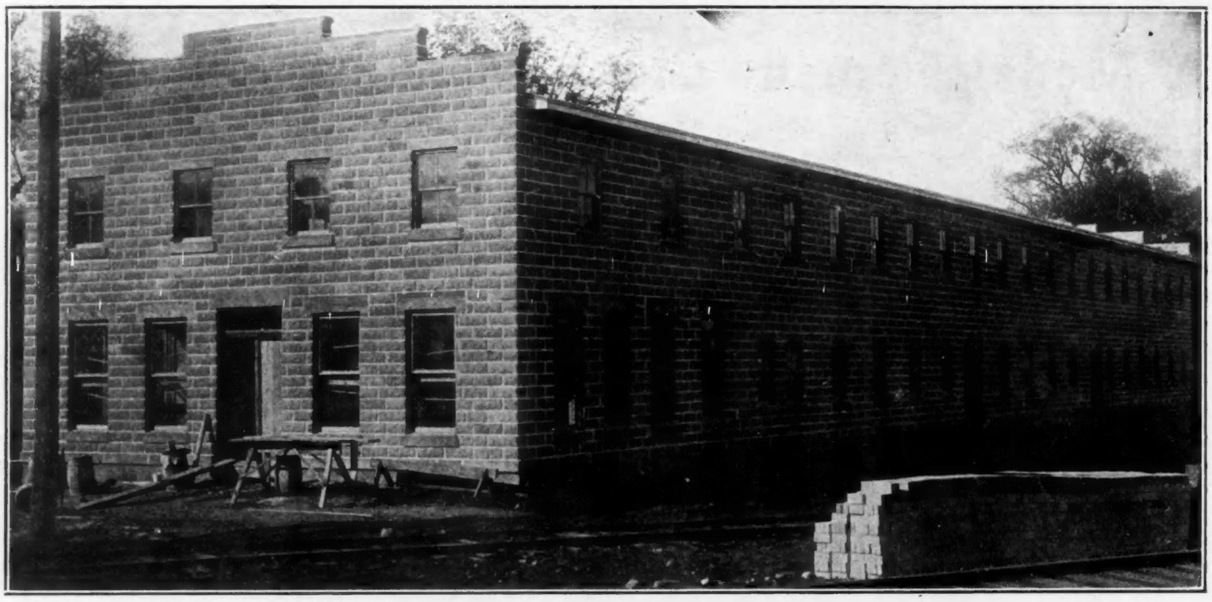
The rapid and peculiar motion of its 23 paddles attached to the center (mixing) shaft, making 62 revolutions a minute, throwing the material over itself and giving it lateral and edgewise thrusts, the entire product gets a thorough and absolutely perfect mix.

We make and try to keep in stock our Special Type of Grant with mixing cylinder 10 ft. in length and equipped with 53 paddles, a superb mixer designed for dry concrete. This we sell with or without power, stationary or on wheels, and is essentially a machine for block and all kinds of artificial stone work.

Make no mistake but send for Booklet "G" and prices.

Ready for Shipment

U. S. CONCRETE MACHINE Co., Majestic Bldg., Detroit, Mich., U. S. A.



Factory Building at Portland, Michigan. Built by J. C. Blackston & Son.

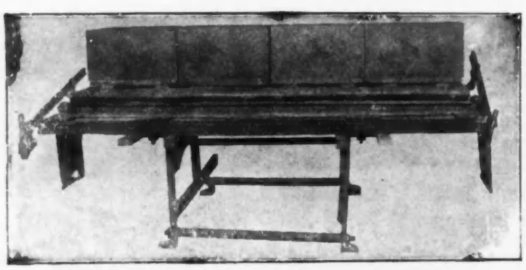
The Blocks Were Made on the Coryell Machine

Manufactured by

The Kells Foundry & Machine Co. Adrian, Michigan

Let Us Have Your Inquiry

THE RECORD-BREAKER



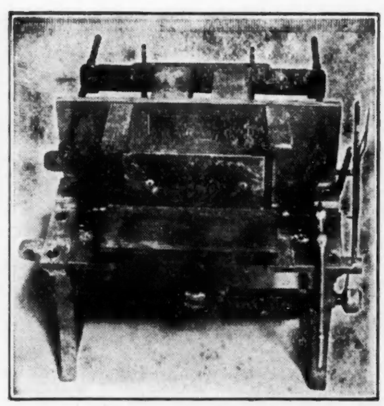
Makes and Delivers Four 16-inch Blocks in Three Minutes at the rate of 80 per hour or 800 in ten hours. The **Francisco Block Machine** is adjustable to make everything required to build a building. such as circles. octagons, angles, water table, caps, sills any length desired up to 6 feet. Four 16-inch blocks or two 24-inch blocks or two 32-inch blocks, or four 32-inch veneered slabs, made at one operation. Also makes interior finish, such as base, casing, molded heads, wainscoting, wainscoting molding, also sectional block, any width from 1½ inches to 32 inches. Makes blocks face down from wet concrete—2 sand, 1 cement—for facing balance block, 1 cement, 3 sand, 7 parts crushed stone or gravel. No sprinkling required until block is removed from pallets as concrete is made wet. We also furnish device for making concrete pallet.

You cannot be guided by what you read, for so many make such claims as the only machine that will do this or that when they have nothing but the dry process side-face, and require sand and cement instead of concrete. Any concrete worker knows that better blocks can be made for at least one-third the cost from concrete. The longer you continue to use your sand block machine the more you lose. We take old-style dry-process machine in exchange for the No. 1 Adjustable.

Come to Columbus and see a process of making blocks different from any on the market. No sprinkling required until blocks are turned from wood pallet. Will also show a side-face machine that will make length up to 60 inches, adjusted to make width 24 inches wide. Molds to make blocks, from $10.00 to $15.00 each. Patent fence mold, $10.00.

The price of the outfit will surprise you. Send for catalogue.

THE FRANCISCO ADJUSTABLE BLOCK MACHINE CO.
COLUMBUS, OHIO



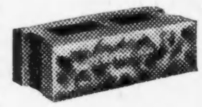
Side Face Machine

The "REED" machines are in the lead. TIME is MONEY! Why not save Time and make Money? Why use a Machine that you tear down and set up every time you manufacture a block.

Why "NOT" use a machine when adjusted for the dimension of block desired which manufactures blocks and not waste time in tearing down and setting up for every block of the same dimension produced? The Reed Face Side and Face Down block and brick machines are simple, rapid and adjustable. Blocks and brick are raised or turned out of machines. Capacity 350 to 600 blocks, and 6000 brick in ten hours.

If interested it will pay you to write us at once.

The Wichita Coal & Material Co.
WICHITA, KANSAS



EUREKA

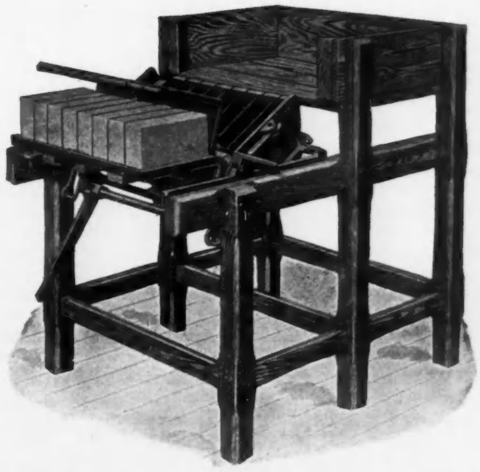
We have found it

Automatic, quick, and perfect operating concrete machinery.
Six kinds of block machines stationary and portable, side face and face down.
Four kinds of brick machines.
Two kinds of drain tile machines for small tile.
The best mold for round sewer pipe from 6 to 24 inches.
Reinforced three piece construction for large sewers, conduits, etc.
Fence post and sill machines.
Mixers and gas engines.
Send 25 cents for Catalogue and instructions on concrete work.

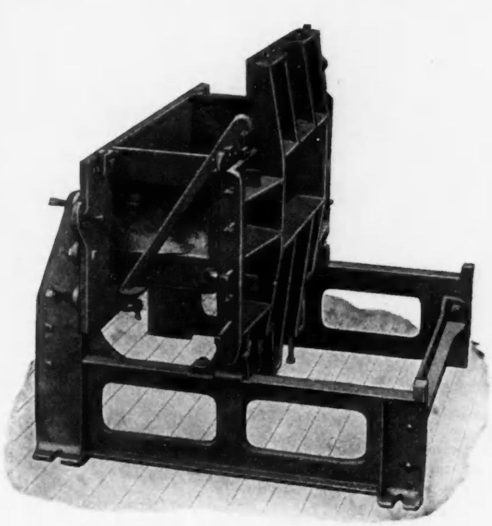
THE BESSER MANUFACTURING CO.,
302 South Second Ave., Alpena, Mich.

Get the Best

Our 1906 model FACE DOWN MACHINE makes blocks hollow or solid, all lengths and widths. Makes circle, octagon, hexagon, veneered, crown moulding, and many fancy blocks, also water tables. Send for Catalogue No. 5.



BOOS AUTOMATIC CEMENT BRICK MACHINE



COLTRIN MFG. CO.'S BLOCK MOLD

The BOOS AUTOMATIC BRICK MACHINE will make standard brick, plain or rock face, designed especially for facing the brick. Compare its merits with its competitors, the rapidity of its work, quality and uniform size. One man can turn out brick faster on this machine than two men will mix the material and put on table for him. Address,

Coltrin Mfg. Co.
140 West Main St. ::: JACKSON, MICH.

The Architectural Mold Co.

This cut illustrates results obtained from our

BALUSTER POST AND BASE BALL CAP MOULDS

Photographed direct from the cement products.

We have these **Baluster Post Molds** in the following sizes: 12x12, 15x15, 16x16, and 18x18, all 8¾ inches high. Also 12x12, 16x16, and 18x18, 7¾ inches high.

The **Base Ball Cap Molds** are in the following sizes: 9-inch sphere, 12x12 base; 12-inch sphere, 15x15 base, also 16x16 base; 15-inch sphere, 18x18 base.

These molds have our corner locks, which easily and rapidly adjust the molds to their proper alignment.

Full particulars and prices furnished upon application.

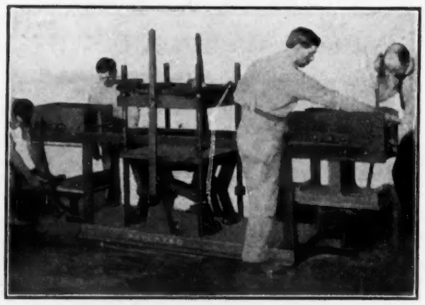
THE ARCHITECTURAL MOLD CO.
1174 Theodore Street
DETROIT, MICH.

SUPERIOR
THE BEST
CONCRETE BLOCK MACHINE

The SUPERIOR makes the stone with the face down or in the bottom of the flask, which permits of the use of fine rich material for the face and coarser, cheaper material for the main body of the block.

It is manufactured by
T. O. EICHELBERGER COMPANY
DAYTON, OHIO
who will gladly tell you all about it. Write them.

Hollow Concrete Walls and Partitions—Two Piece System

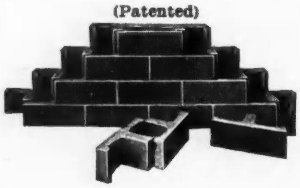


WHEN YOU FIND—That one piece hand tamped blocks make wet walls,
That such walls are not stone but cemented sand,
That damp sand and cement will not make true concrete,
That tamping damp sand displaces that already tamped adjoining,
That this produces a block lacking in density,
That you cannot safely plaster on such a wall without expense of furring,
That you have a soggy wet wall for days succeeding every storm,
That you have a wall with only thirty per cent of air space,
That you have no continuous horizontal air space,
That you have a wall with no cross bond,
That you have a system, requiring two men to handle a block and a derrick to put it in the wall,
That you have a system slow and laborious in manufacture and laying,
That you have no way of facing your work : (Patented)
Then write to—

THE AMERICAN HYDRAULIC STONE CO., Century Building, Denver, Colo.

Ask for a prospectus describing the two piece wall containing the header bond, made of True Concrete, stronger in a 1 to 10 mixture than hand tamped damp sand and cement is in a 1 to 3 mixture. Every block made under heavy pressure, in steel moulds, in one set of which all the different widths of wall from 2½″ to 17″ can be made by simply changing the adjustment, making a wall 50% hollow containing an air chamber both in the horizontal and perpendicular, through which moisture, heat and cold cannot penetrate—a block easily handled by one man—to which any facing desired ½″ thick is applied before the block is pressed; one thousand square feet of wall per ten hour day made, cured, and cared for with nine men—three times the daily product possible under any other system.

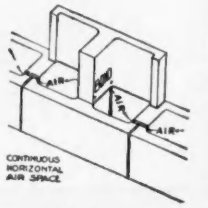
(Patented)



UNIVERSITY OF ILLINOIS Champaign, Ill., Sept. 29, 1904.

Gentlemen:— * * * I have, I believe, investigated all the principal systems of hollow concrete wall and partition construction now on the market, and have no hesitation in saying that your system of manufacturing is the only one I know of that obtains perfectly satisfactory results both in the block and in the finished wall.

Very truly yours, (Signed) JAMES M. WHITE,
Professor of Architectural Engineering.



WHY not manufacture your own Building Blocks? We have the machine that will do it. The machine that makes the right kind for all buildings.

It makes building-blocks from 4 to 32 in. in length, and any height from 4 to 12 in.

It draws the cores, opens end plates and draws the division plates with one operation, working simultaneously.

It makes two 16 in. or one 24 in. and one 8 in., or one 16 and two 8 in. and one 32 in. blocks.

It makes sills, lintels, water table, coping, and sidewalk tile up to 48 in. in length and 24 in. wide.

No cogs, no gears, no chains, no cranks, no levers in the way, no iron pallets needed, no bolts to remove in changing cores, no bolts to remove to adjust, no hopper to remove, no square needed, no broken corners, no breaking corners by drawing division plates, no skilled labor required.

THE HANCOCK BLOCK MACHINE CO., Lestershire, N. Y.

Patented Nov. 7, 1905. Pat. applied for. Write for Catalogue and Price.

Waterloo Concrete Brick & Block Mach. Co.

ONE movement of the lever operates the **ENTIRE** machine, consuming the least time for operation of any machine. Two men will make 250 blocks per day.

Our block is patented. Has double, a vertical and horizontal air space.

The brick attachment makes 18 brick as easily as a block.

No gears or chain to clog or break.

Write for catalogue "B." **O. H. SWEENEY, Sec.**

Agents Wanted. 101 E. 4th St. WATERLOO, IOWA.

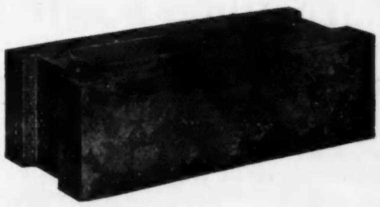
Southern Agents, SILVERA & GADSDEN, Savannah, Ga.
Agents for the Pacific Coast, C. J. TALLON & CO., 618 Bailey Building, Seattle, Wash.

Notice to Architects
Contractors and Builders

THOUSANDS of hollow concrete houses were built this last year and ten times as many are being arranged for this coming year. While such buildings are comparatively new, yet the oldest buildings and work in the world are concrete material. We have had twenty years experience in concrete work, but as every new invention and discovery has difficulties and defects to overcome, we had an expert engineer travel and examine buildings that have been built of Hollow Concrete Blocks. He found lintels, sills and blocks cracked. As you readily understand, a solid block is much stronger than one with a large percentage removed. We experimented, made tests and invented a wire reinforcement which we patented. This strengthens blocks, lentils, etc., so they would not crack and would stand any strain. Tests show they would stand 1500 feet high before bottom block would commence to crumble. 40,000 of these were placed in the sewerage pumping station where the strain of the powerful machinery required the strongest construction. By using this reinforcement in the blocks they can be made so much lighter that one man can make and lay same, being a great saving in labor and material. Foundations, basements and even the first stories of frame buildings can be made of Hollow Concrete Blocks as well as lentils, sills, etc. Our machines make blocks face down. The face can be made one-fourth inch thick, any color, the balance of the block ordinary concrete. We make machines any size, from a hand machine that can be moved instead of the blocks, to a machine that turns out five blocks at one time. Write us and get full particulars regarding machines, cost, etc. We also furnish forms, shapes and moulds for all kinds of ornamental concrete work.

National Hollow Concrete Machine Co.

Department K No. 921 F Street, N. W. Washington, D. C.



We Move the Machine NOT THE BLOCKS

Saves labor of off bearing, loss by damage; obviates necessity for heavy and expensive iron pallets. Reduces cost o plant and cost of operation. Every one knows that con crete should not be disturbed after it is molded or while it is setting, but this is the only machine by which this is possible. The blocks cost 6 cents to make—sell for 18 cents. One man can make 200 blocks per day. Whole outfit costs $125.00. Figure the profits.

Competition simply demonstrates the superiority of the Pettyjohn machine. Unlimited guarantee. SENT ON TRIAL

THE PETTYJOHN COMPANY

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FACTS CONCERNING THE

HARTWICK AUTOMATIC CONCRETE BLOCK MACHINE

All parts are machine finished and every block guaranteed perfect.
Makes all forms, **Solid or Hollow Blocks.**
Has fewer parts and works easier than any other machine.
No Springs—No Cogs—No Wheels. Simplicity and **durability** its strong points.
Either **Wood or Iron Pallets** for all kinds of work.

THE SCHEIFFLER, Continuous Automatic Proportioning Mixer

The only Mixer that will automatically proportion in any amounts from 1 to 2, to 1 to 10, and **will not clog** with Cement.
Made in all sizes; any kind of power required.
Used for all kinds of **Street and General Contract Work.**
Hand Machines are fitted with pulley power—can be attached.
Are especially adapted for **Concrete Block Manufacture.**

HARTWICK MACHINERY CO.

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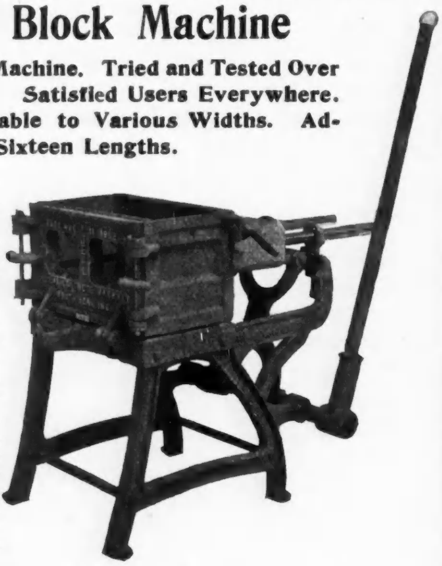
On the High Wave of Popularity

The Ideal Hollow Concrete Block Machine

Not a New Machine. Tried and Tested Over Two Years. Satisfied Users Everywhere. Interchangeable to Various Widths. Adjustable to Sixteen Lengths.



No wheels, cogs, gears, chains or cranks.

Nothing to clog, break or get out of order.

Simplicity, rapidity, adaptability, durability.

Face formed in bottom of the mould.

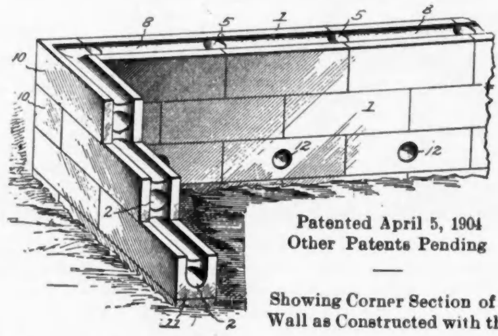
Cores withdrawn horizontally by lever.

Guaranteed Capacity—two men, 10 hours, 200 blocks.

Portable—Can be carried by two men
Over 200 in use in the state of Indiana alone.
The only machine by which can be accomplished the facing of blocks by the Borst System.
A business proposition to the maker of blocks.
An appeal to the common sense judgment of the builder.
In correspondence with us we make our business your interests.

Ideal Concrete Machinery Co.
SOUTH BEND, INDIANA

An Improved Block
An Improved Machine



Patented April 5, 1904
Other Patents Pending

Showing Corner Section of Wall as Constructed with the

UNDERWOOD VENTILATING BUILDING BLOCK

WE WISH to call especial attention to the **ventilating** feature of our block, also the **Improved Block and Machine**, the **strength** of the block, all openings being circular, the **simplicity** of the machine and the **rapidity with which it can be operated.**

This machine and block are fully protected by patents. Territorial Rights for Sale. Agents wanted.

Underwood Building Block and Machine Co.
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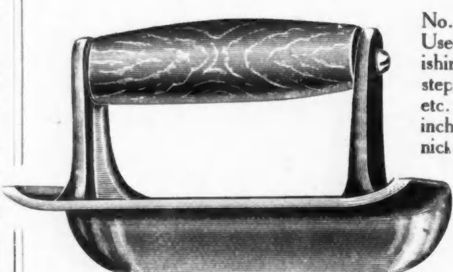

No. 4 Edgers. Used for finishing edges on steps, walks, etc. Size, 3x6 inches. Iron, nickel plated.

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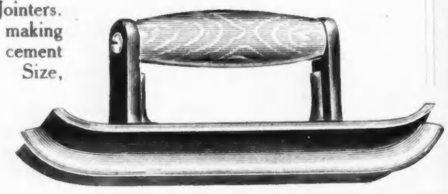

No. 1 Jointers. Used for making joints in cement walks, etc. Size, 2½x6.

Both sides rounded.

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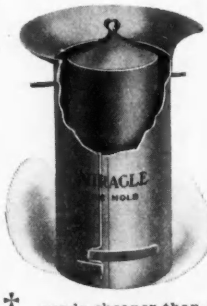
Better write at once for our new Catalogue of "Contractors' and Builders' Supplies."

"If it's from Gross it's Good."

PH. GROSS HDW. CO.
126-128 Grand Ave., MILWAUKEE



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MORE MONEY MOLDS

Every town and locality use sewer pipe or drain tile. Yours does. Your customers (that might be) are buying clay pipe or tile at big prices, paying big freight rates, and buying in carload lots against their wishes. Somebody in your locality will soon learn of CEMENT tile and the Miracle Molds for making them. Why don't you? Cement tile can be made cheaper than clay and will sell for equally as much. The Miracle Improved Molds made this possible. They can be removed immediately after tamping.

Our Catalog "K" 4 will tell you all about it

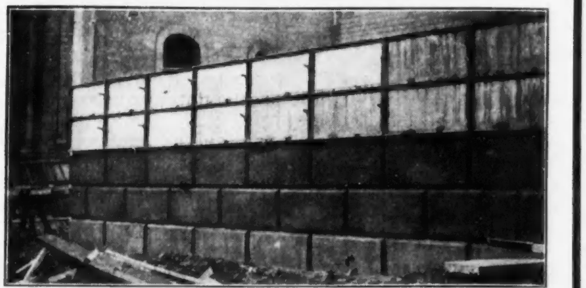
Miracle Pressed Stone Co., Minneapolis

"Best" Cement Sidewalk Tools

Brass Rollers, Bronze Edge Groovers and Center Groovers, Spring Tempered Edge Groovers and Center Groovers, Step Finishing Tools, Iron Tampers, etc.

SEND FOR 1906 CATALOGUE AND PRICE LIST
The Most Satisfactory CEMENT SIDEWALK TOOLS in the World

THE WOODHOUSE HARDWARE MFG. CO.
2618 So. 13th Street, St. Louis, Mo.



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Makes a Permanent, Continuous, Reinforced, Hollow or Solid Wall for use in building
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You can make from 25 to 30% profit and build cheaper and better than with brick or concrete blocks.

They require no expensive labor and prevent the use of an immense lot of expensive lumber.

We are booking orders for spring deliveries. Write for prices and description.

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PAINT YOUR CONCRETE BUILDINGS WITH
R. I. W. PAINT
"REMEMBER IT'S WATERPROOF"

Sold in Barrels, $1.25 per gallon; 5-gallon cans at $1.35 per gallon; 1-gallon can, $1.50 per gallon; all F. O. B. Chicago.

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Special Elastic Compound for Each Specific Purpose.

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Construction Taught
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MIRACLE CEMENT BRICK

Are Fast Displacing Clay Brick

The New Miracle One-Man Brick Machine

Cement are the most durable kind of brick. They can be made for much less money than any pressed brick, and are equally as good. The profits are therefore large. The necessary investment is very small. The field is large and growing fast. We will gladly tell you all about it in Catalog

"K" 3

Miracle Pressed Stone Co., Minneapolis

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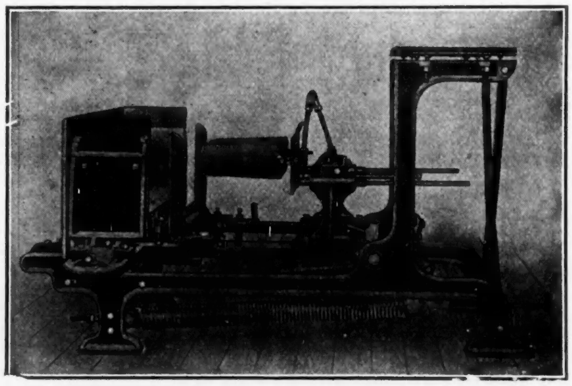
is not educated as to the degree of perfection to which Block Machines have attained, many believing the cheap machines will do the work, as it is nothing more than an experiment.

However, this idea is wrong, and experimenting with an inferior machine will invariably prove a failure.

The Block business is permanent, and the trade demands that the machine prove its efficiency before it becomes a fixture on the market.



The success of our machine is established, and it is classified as permanent and invaluable because of its many superior features.

Its speed is unlimited, and you are assured of the very best results in quality and appearance of blocks, because of the fact that they are moulded with the face down.

Write us for descriptive catalogue J.

AUTOMATIC BUILDING BLOCK MACHINE CO.

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BETTER CONCRETE IS WHAT YOU'RE AFTER

The strength and durability of concrete is not in the amount of cement used, but in the way it is MIXED with other materials. For that reason you should investigate

THE POSITIVE MIXER

This is not a tumbling barrel. The drum of the Positive revolves in the opposite direction to the mixing device, which is composed of parallel and angle blades, and the mixture is completed by an automatic sprinkling device at the OUTLET. It is self cleaning, saves time and money, and is automatic and positively mixes.

Send for Catalogue "W".

THE JAEGER MACHINE CO.
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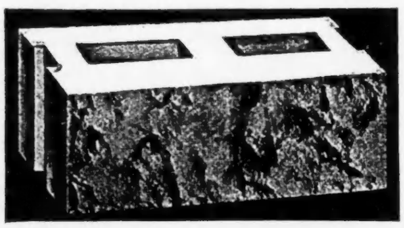

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"LAKE PATENTS" A WET SYSTEM

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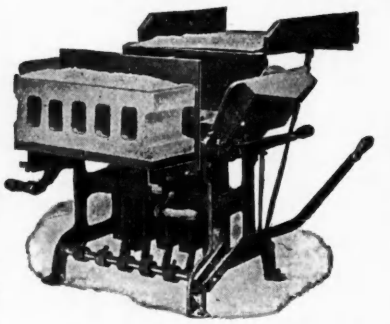

"Simplicity"

Building Block Machines are sold **direct from Factory to Block Manufacturer,** which enables us to quote you a very low price.

Write for further information.

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THAT TELL YOU HOW TO DO IT BY UP-TO-DATE METHODS

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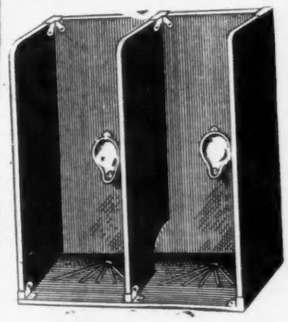

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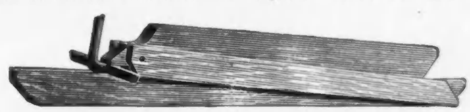

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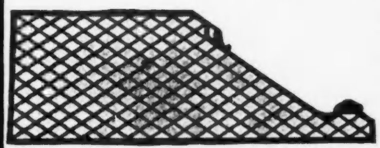
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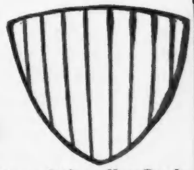
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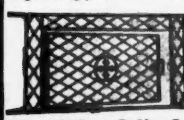
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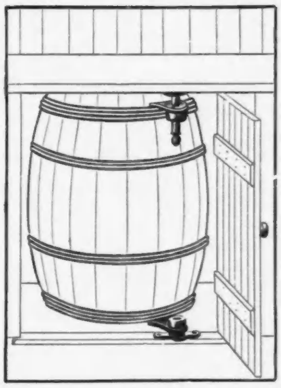

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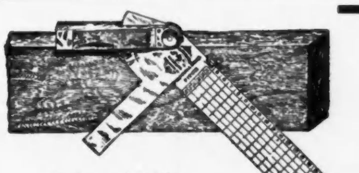

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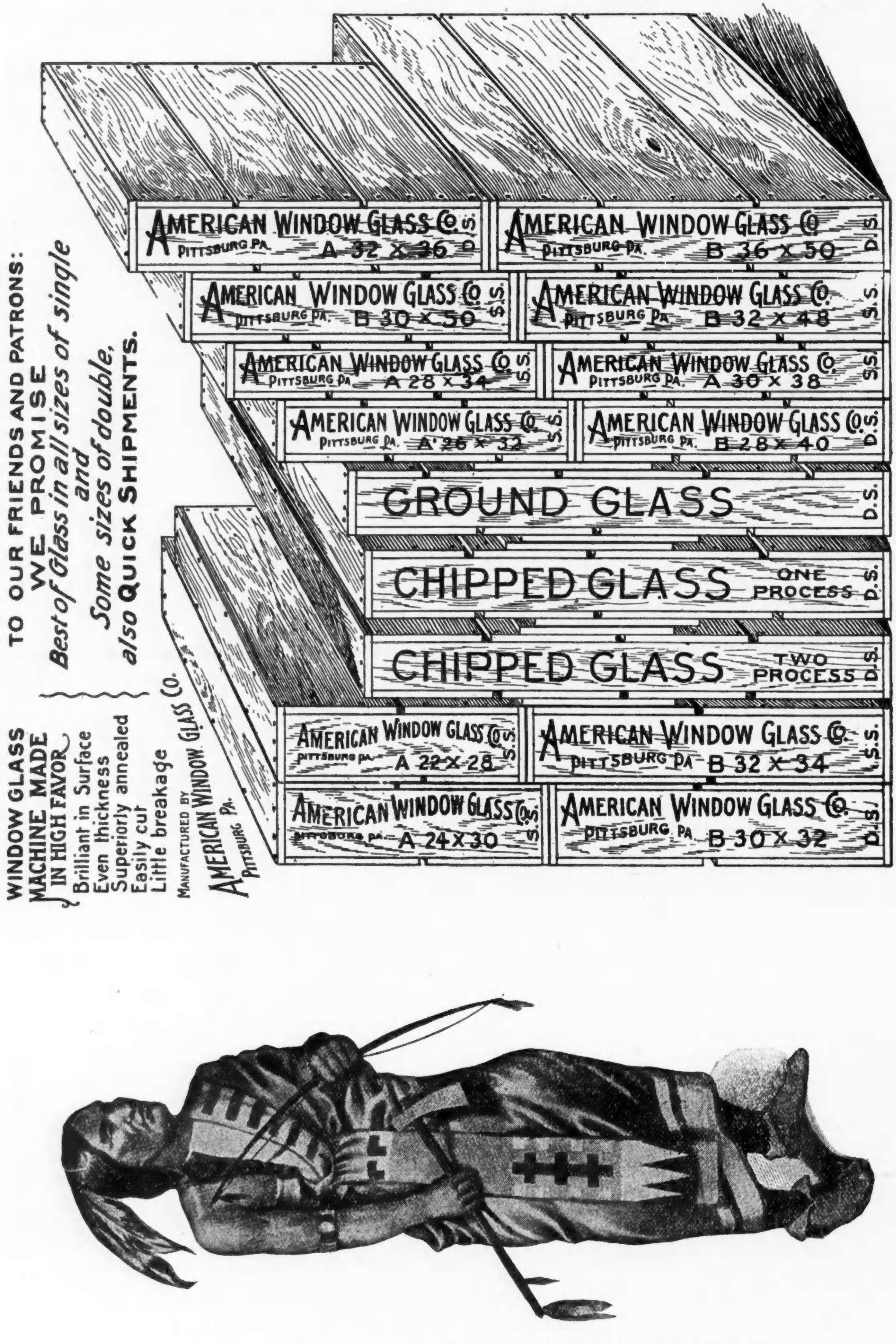
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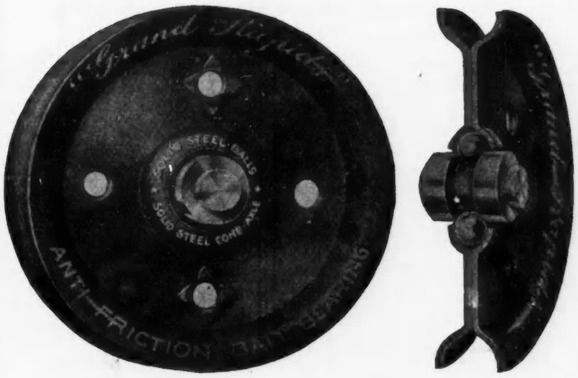

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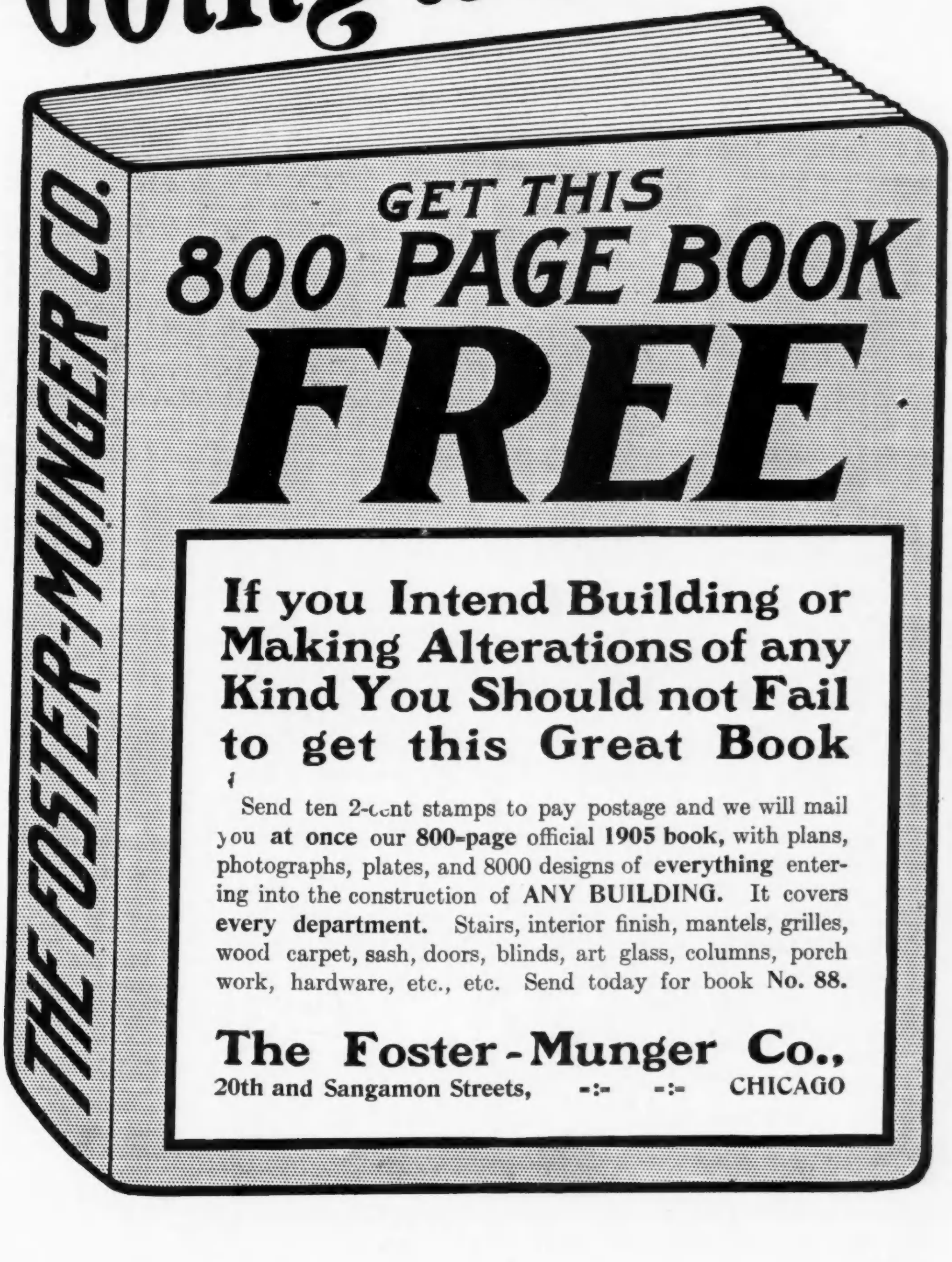

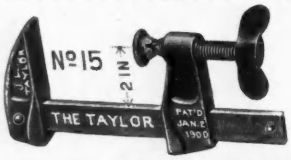

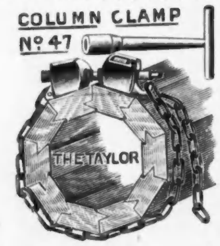

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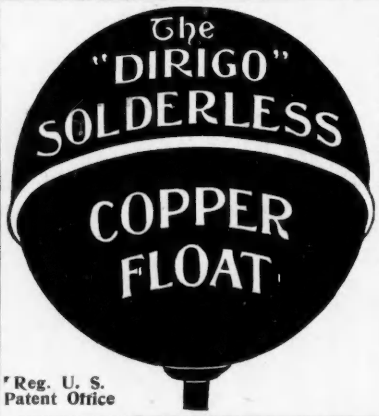

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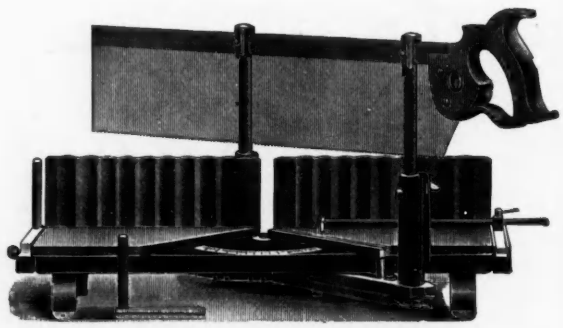

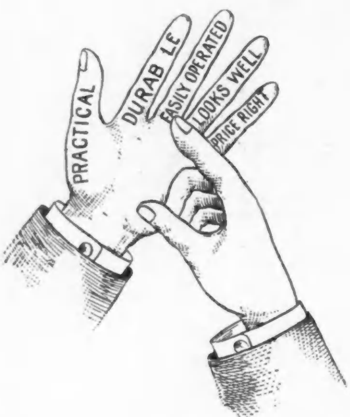

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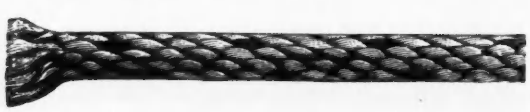

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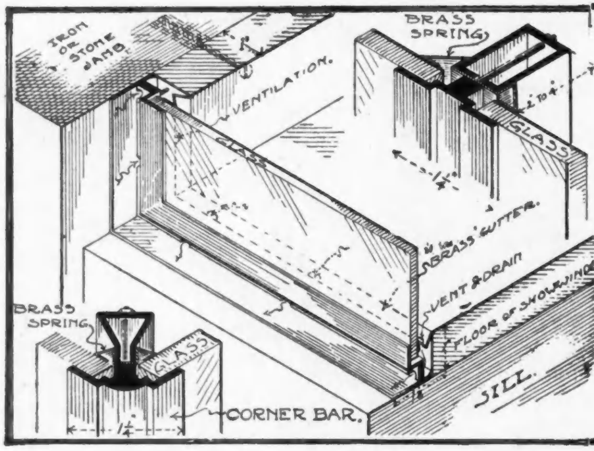

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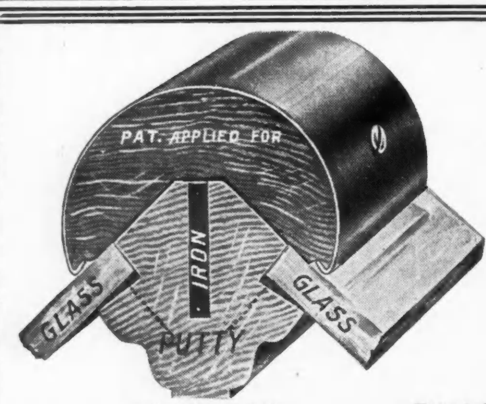

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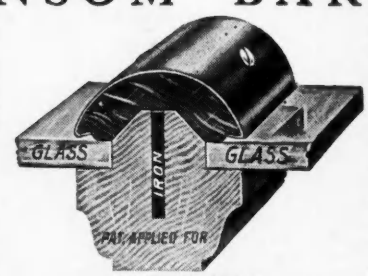

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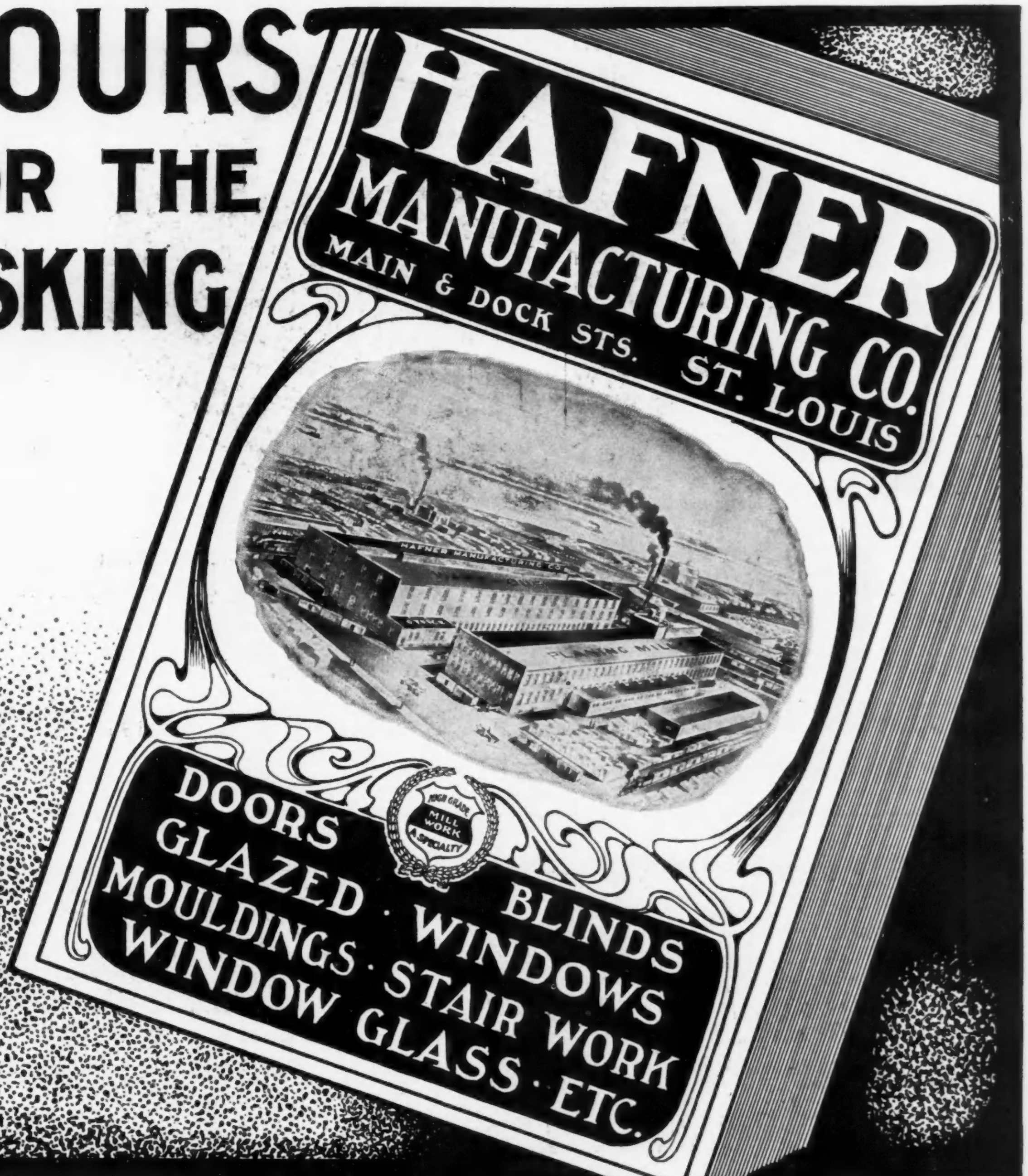

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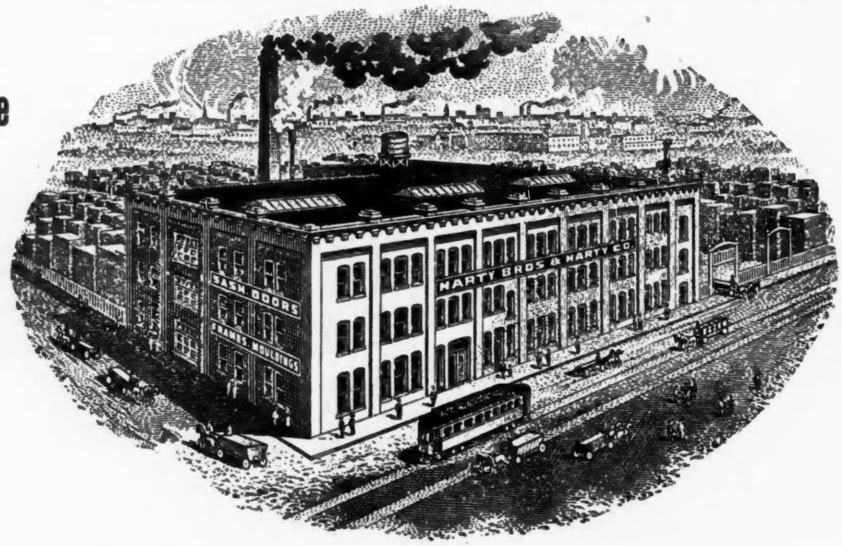

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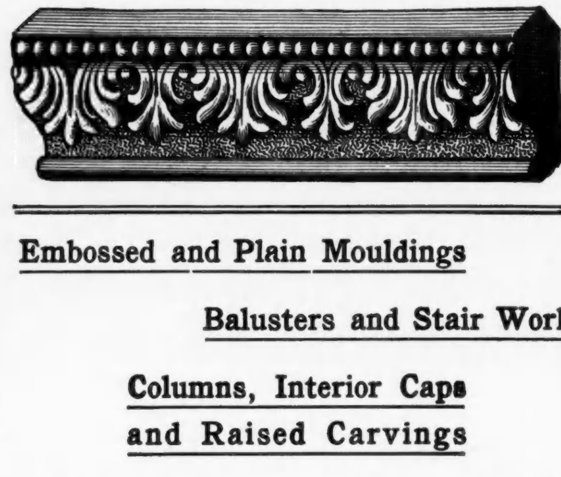

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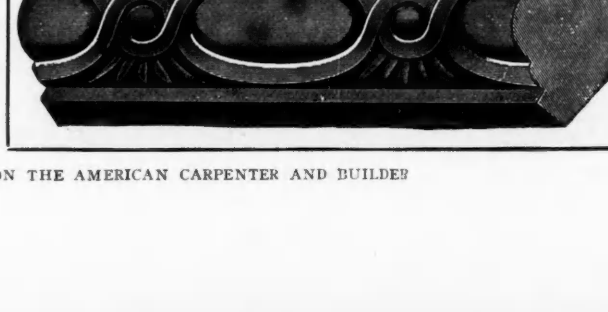

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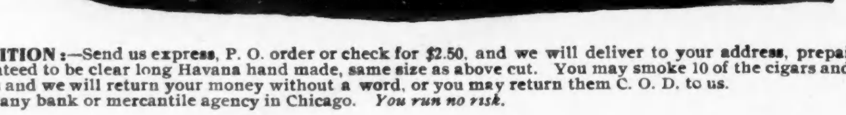

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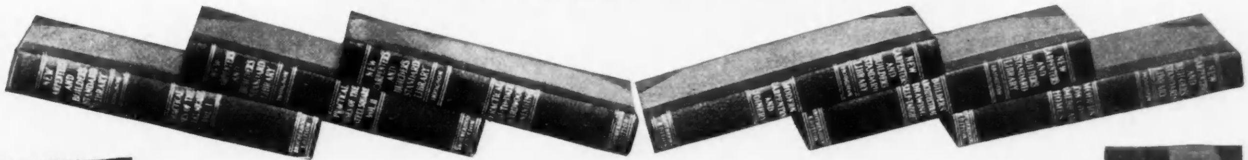

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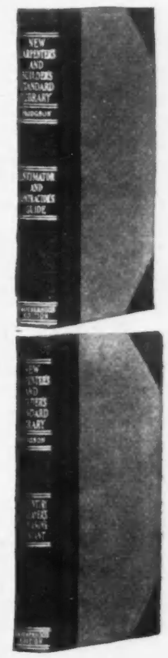

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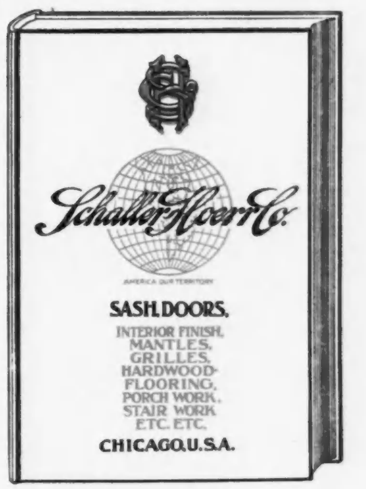

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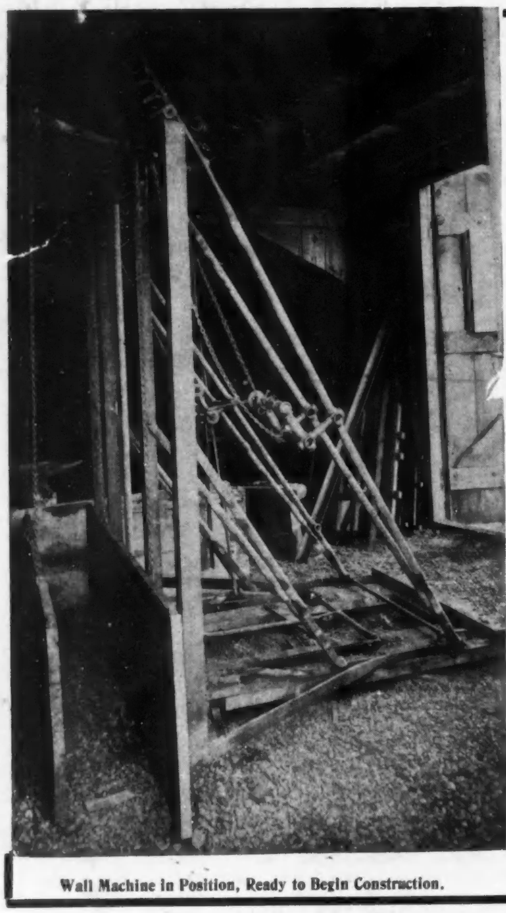

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