Prints

AMERICAN CARPENTER AND BUILDER

AUGUST, 1905

Price, 20 cents

Do YOU USE GLASS IN YOUR BUILDINGS?

Send for our ART BOOK and Special Designs

FREE! Write To-day

THE LATEST—OUR LACE CREATIONS FOR DOORS.

If you intend building or are in need of GLASS OF ANY KIND, you should not fail to get our Catalogues of Designs and Prices.

Send us your plans or a rough pencil sketch, showing positions and sizes of windows, and we will furnish you with *SPECIAL DESIGNS* and quote *PRICES*. We manufacture the **Highest Grade** of work at **Low Prices.**

Inquire on your next estimate for **Door Lights** with **Beveled Plate Set in Copper.** Send for art catalogues to-day.

THE SUESS ORNAMENTAL GLASS CO.
Throop and 21st Streets, Dept. C. CHICAGO.

"THE MILES Concrete Building Block Machine"

Makes all blocks face down, which insures a finer face for the block. We make all and any kind of a block necessary in the construction of a Building

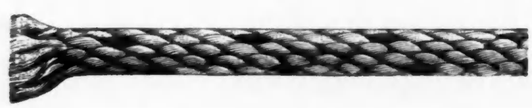
Write us today for circulars and descriptive matter

No. 28 Dwight Building
Jackson, Michigan

You don't have to waste Spot Cord by cutting out rough places

SAMSON SPOT CORD

is warranted free from flaws. The colored spot is our trade mark, used only in this extra quality cord



SEND FOR CATALOG "A" AND SAMPLES

SAMSON CORDAGE WORKS, BOSTON, MASS.

PLUMBERS' SUPPLIES
AT WHOLESALE

If you need anything in my line, and wish to

SAVE

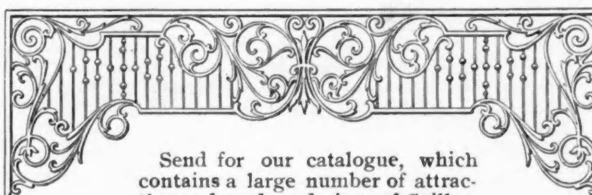
20 to 40 Per Cent

on every article, write for my free illustrated Catalog. Shipments promptly made from a very complete stock of guaranteed goods.

Small orders are as carefully handled as large ones.

B. B. KAROL, 333 W. Harrison St., Chicago, Ill.

NORTHWESTERN GRILLE WORKS



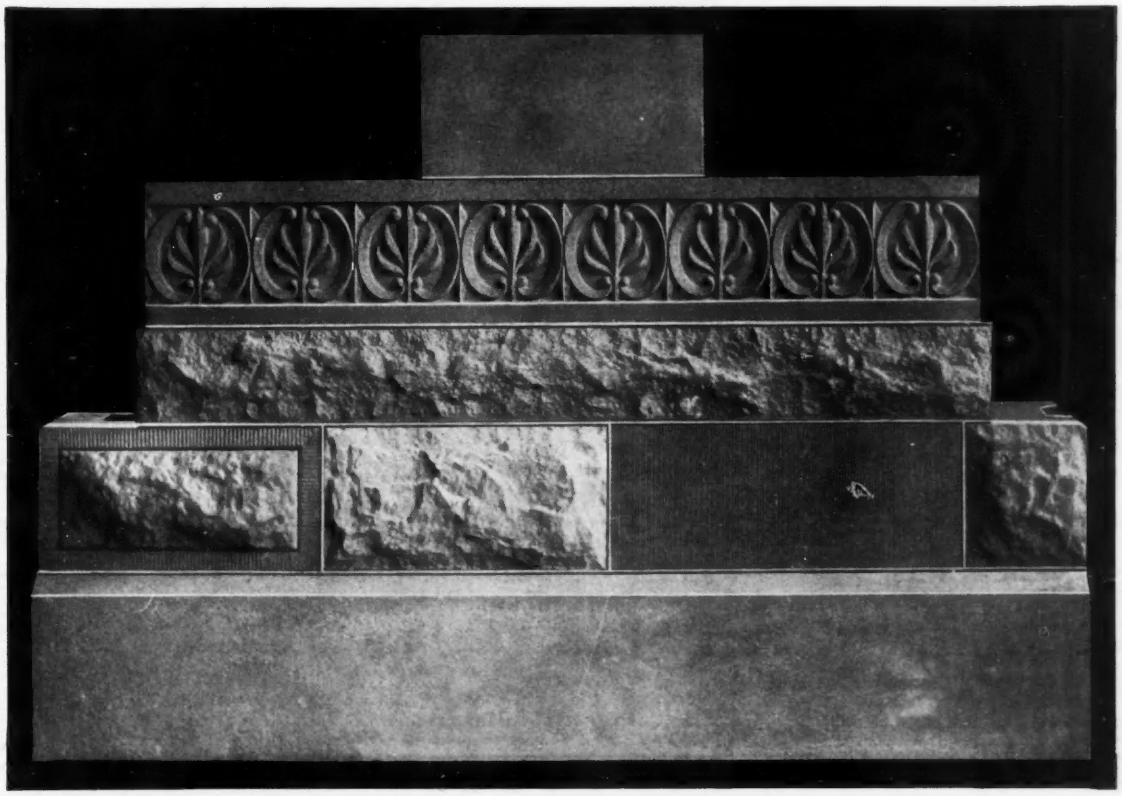
Send for our catalogue, which contains a large number of attractive and modern designs of Grilles.

OFFICE AND FACTORY

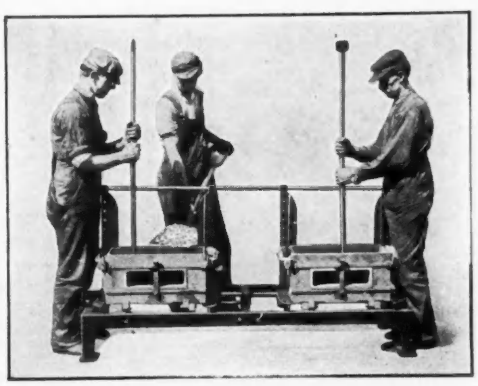
1452 Milwaukee Ave., CHICAGO.

CHRISTENSON BROS., Props.

That Hercules Cement Stone Machine



Taken Directly From Stone, Made On One Hercules Machine



Showing Method of Making Two Stone at One Operation

Knowledge is Based on Reason

You may **SUPPOSE** that an artificial stone machine is superior, but if you would know, you must have reasons. We **KNOW** the superiority of

"That Hercules Machine"

Here Are Some of Our Reasons:

Reason No. 1. "That large variety," which means supplying the architects and builders with that class of stone essential for all building purposes. It is the only machine in the world that can make, in addition to hollow blocks of **all shapes** and **sizes,** water tables, sills, lintels, coping and **ornamental** work, up to **6 feet** long, all on the one machine.

Reason No. 2. "That double operation feature" permitting two stone to be made at one operation, doubling your capacity and reducing the cost of labor to a minimum, saving you the expense of purchasing two machines—important item, this.

Reason No. 3. "That tamp on the face method" guarantees a perfect reproduction of the face plate, which means stone that has the appearance of natural stone,—that bold, sharp appearance,—allows 2 to 1 composition for facing and 5 to 1 for backing—great saving in material, this, and insures a face on the stone that will be durable. By this method you may make your **mixture more wet,** guaranteeing perfect chemical action and a stronger stone.

For Accuracy, Strength and Simplicity of Construction and High Class Work, "That Hercules Machine" is Without a Peer. Send for Beautifully Illustrated Catalogue X, With More Reasons

Century Cement Machine Company, 173 W. MAIN STREET ROCHESTER, N. Y.

Key to the Steel Square

By ALFRED W. WOODS

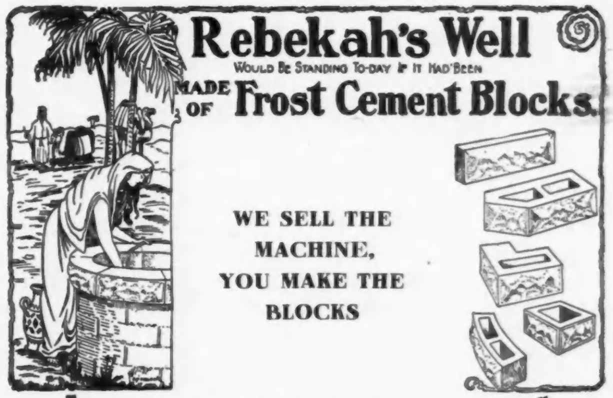
It is a wonderfull instructor. It instantly gives the figures to use on the common steel square for the lengths, cuts and bevels for all rafters. It also gives the figures to use for all polygonal miters, hopper cuts, etc. Size, three inches in diameter, complete with book of instruction, all in morocco case suitable for the pocket. Can be consulted at a moment's notice.

Price, post paid, $1.50

Send express or money order to

ALFRED W. WOODS

198 Fifth Avenue, CHICAGO



WE HAVE A PROPOSITION TO MAKE YOU RIGHT NOW IT WILL INTEREST YOU

Write us. You cannot afford not to. Our catalogue illustrates our machine, which is practically 40 machines in one.

Write us today, not tomorrow

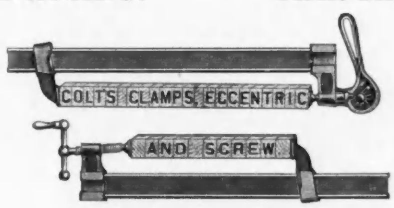
FROST CONCRETE STONE CO.

607 Commercial Avenue :: :: :: WATERLOO, IOWA

COLT'S CLAMPS

Steel bar any length desired.

QUICK ACTING. TIME SAVING.



Ask for Catalogue No. 124

BATAVIA CLAMP CO.

57 Center St., BATAVIA, N. Y.

Awarded Gold Medal, World's Fair, St. Louis

Highest Award World's Columbian Exposition

DRAWING MATERIALS SURVEYING INSTRUMENTS

Drawing and Blue Print Papers, Architects' and Builders' Level, Drawing Instruments, T Squares, Triangles, Scales, Inks, etc. Steel and Metallic Tapes. Builders' Levels. Repairing promptly executed. :: :: :: :: :: :: :: :: ::

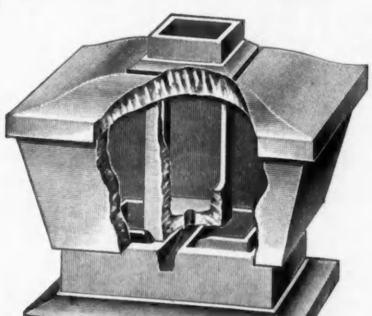
BLUE PRINTS, BLACK PRINTS and BLUE ON WHITE PRINTS **OUR SPECIALTY**

CHICAGO BLUE PRINT PAPER CO.

Room 550, 160 Adams St., Rand-McNally Bldg.

Telephone Main 3891 CHICAGO

CONCRETE CHIMNEY CAPS



Improved

Useful, Durable, Inexpensive

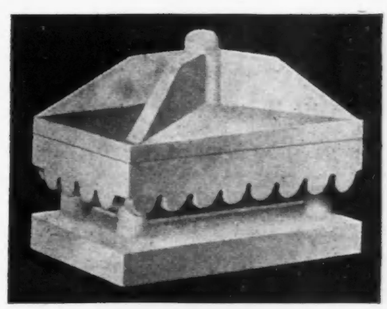
Architects recognize and specify on their merits.

We want to send you a leaflet telling about them. Write.

We want a man to handle our ware in Chicago. Write.

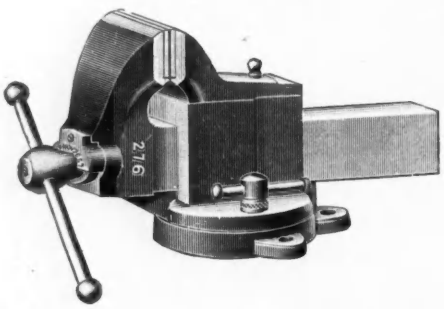
National Chimney Co.

HARTFORD, CONN.



Old Style

PARKER VISES



MADE ESPECIALLY FOR WOOD WORKERS.

FOR SALE BY DEALERS.

SEND FOR CATALOG.

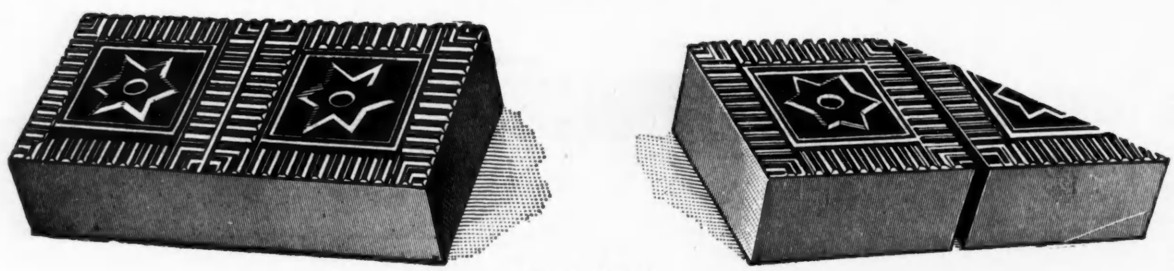
CHAS. PARKER CO.
MERIDEN, CONN.

This Shelf Pin is neat in appearance, strong, easily put in place, easily removed, without the use of any tool, not liable to sag down or drop out of place. I have a neat model with pin attached which I will send to Architects.

It will support all kinds of movable sheves in all kinds of cases, or cupboards, or cabinets.

Why Buy Something That is Not Durable?

There is Practically No Wear Out to a Vitrified Sidewalk Tile.



SIZE 5 x 10 x 2½

Star Sidewalk Tile are made from pure fire clay, thoroughly vitrified and glazed. They make a beautiful walk.

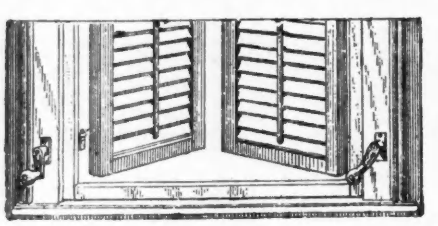
We have been manufacturing them for 12 years. We are offering you no experiment, and we are not afraid of being successfully contradicted when we say they cannot be beaten by any substitute.

We can refer you to hundreds of cities where they are being used for sidewalks. They are also used extensively for depot platforms, boiler rooms, power houses, basements; in fact, any place where a handsome floor or walk is desired. They can be imitated, but not duplicated, by others.

FOR FURTHER PARTICULARS WRITE

THE NELSONVILLE SEWER PIPE CO.
Dept. S. **NELSONVILLE, OHIO, U. S. A.**

MALLORY'S



Standard Shutter Worker

New and improved patterns and designs.

Opens and closes the blinds without raising the window. Automatically locks the blinds in any position desired.

Made of gray and malleable iron. The best and most durable blind hinge. Incomparable for strength, durability and power. Can be applied to old or new houses of brick, stone or frame. *Send for Illustrated Circular.* If your hardware dealer does not keep them, send direct to

FLEMINGTON, NEW JERSEY.

FOR SALE

GASOLINE ENGINE

GREAT BARGAIN

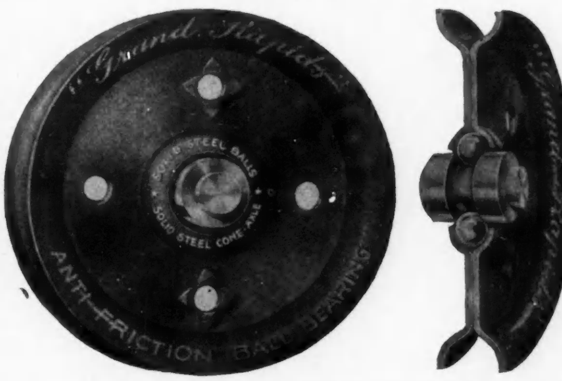
J. M. BACHERT
12 S. Water St. Room 5 CLEVELAND, O.

"BALL-BEARING" GRAND RAPIDS

All-Steel Sash Pulleys

Are sold DIRECT to Builders, Contractors and Mills at prices under the common ordinary goods

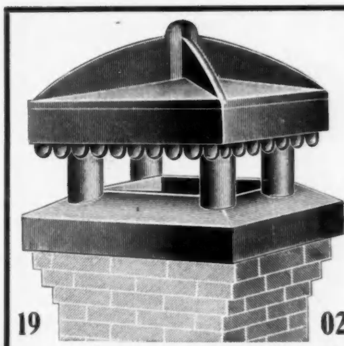
PATENT PENDING



If you make ten or ten thousand window frames, we can save you money and give you a superior sash pulley. We are the largest sash pulley makers in the world. We ship direct, or through dealers and jobbers everywhere.
Write for catalog and free samples and prices on half-gross, gross, barrel, or any quantity. Direct from the makers to you. Inquiries welcome.

Grand Rapids Hardware Co.

33 Pearl Street Grand Rapids, Mich.



Quigley's American Brand

They save your chimney. Give you a better draft.

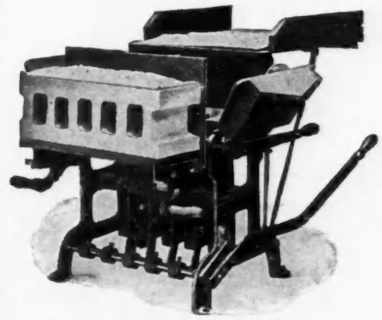
Write for price list and descriptive booklet.

MANUFACTURED BY

The American Artificial Stone Co.

NEW BRITAIN, CONN.

The Standard Sand & Machine Co.



BEST in the world. No experiment. Been on the market since 1903 and successfully stood the test. Ask for catalog "A" and prices.

The Standard Sand & Machine Co., Cleveland, Ohio.

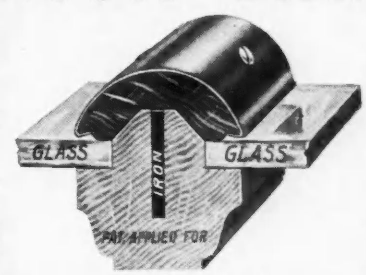
THE "PETZ" CORNER POST AND TRANSOM BAR

GLASS IS SET FROM THE OUTSIDE WHICH MAKES GLAZING EASY

Used in up-to-date Display Windows and Store Fronts. Does not obstruct the light. Gives use of every inch of window for display. Its adaptability and utility will be grasped by every merchant. Send for descriptive circular.

Made only by DETROIT SHOW CASE COMPANY, DETROIT, MICHIGAN
For sale by PITTSBURGH PLATE GLASS COMPANY at its various warehouses

CORNER POST



TRANSOM BAR

PHOENIX SLIDING BLIND CO.

Phoenix, N. Y.

HIGH GRADE VENEERED DOORS

Our New Steel Square

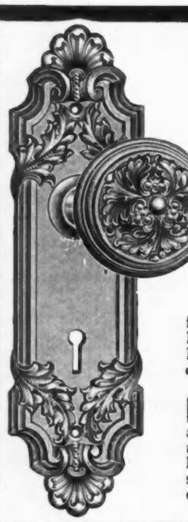
Aside from excellence of material and workmanship, the greatest difference between the best **Carpenters' Steel Square** and the old iron square of the blacksmith, consists of the scales and markings on the improved tool. Our square, as recently improved, enables the carpenter to lay out all kinds of work and to calculate quantities with an ease and accuracy never before known.
Our Steel Square Book, describing the new tool, is a veritable

PRACTICAL TREATISE ON THE STEEL SQUARE

and we will send a copy, without charge, to anyone who in writing us will mention the American Carpenter and Builder

SARGENT & COMPANY

1149 Leonard Street NEW YORK



60c FOR COMPLETE INSIDE DOOR SET IN EITHER DESIGN

Including one lock, one pair Knobs and two escutcheons.

13 Other Designs at same price and others as low as 30c a set—shown in our new

BUILDERS' HARDWARE CATALOG No. 37

which will be sent *free* to any contractor on receipt of request from him showing his *business*, as well as name and address. The Catalog is full of just such bargains as those shown above. *Get it Today.*

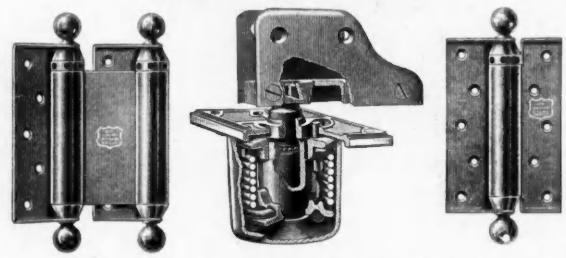
If you use Tools, send 20c to pay express on our 450-page Tool Catalog.

ORR & LOCKETT HARDWARE CO.
Established 1872
71-73 RANDOLPH ST., CHICAGO

Gold Medal Awarded at St. Louis

BOMMER SPRING HINGES

Are QUALITY GOODS But Cost No More Than Inferior Kinds



Spring Hinges lead the strenuous life in Builders' Hardware; no other article in the entire line endures such wear and tear, therefore don't err in judgment, use Bommer Spring Hinges. They stand up to their work.

Your Hardware Dealer can supply them. Insist upon it

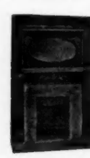
BOMMER BROTHERS, Manufacturers, Est. 1876
255-271 Classon Ave., BROOKLYN, N. Y.
SEND FOR CATALOG

The

DAVIS CONCRETE MACHINE

Some of its qualities are

Simplicity of construction. It makes blocks of all sizes and shapes, rock or smooth face. It makes two kinds of window sills to length of 52 inches. Either wood or iron pallets can be used. ***It moulds perfect blocks. It is adjustable. A boy can operate it.*** Address
W. M. DAVIS, 827 SANDUSKY AVE., KANSAS CITY, KANSAS



HARD WOOD MANTELS

From $5 Up,

With tile and grate complete. We ship direct to you from our factory on approval. Will save you ½ of the dealer's price for the same goods. Or it will enable you to secure from us a coal and wood burning grate guaranteed to heat good sized room in *Zero Weather.*

FREE—Write us to-day for free descriptive catalogue J. We pay the freight to your city, and allow special discounts to the building trade.

Address Dept. J.

HEITLAND GRATE AND MANTEL CO.
Factory, Front and Main Sts. Office, 817 Main St.
QUINCY, ILL.

WE WOULD BE PLEASED

THE "SPECIAL" SAW SET

to send you our Catalog telling all about

Our "Special" and other Tools of our make.

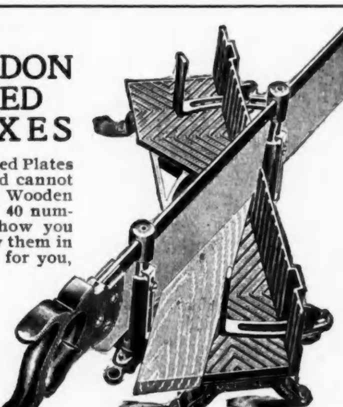
CHAS. MORRILL, 283 Broadway NEW YORK

The NEW MARSH-LANGDON and IMPROVED MITER BOXES

All have Corrugated *Metal* Bed Plates—same are ground *true*, and cannot warp and split like thin Wooden Plates. Made in 4 sizes and 40 numbers. Ask your dealer to show you one, and if he does not carry them in stock, ask him to order one for you, for you want the *best*.
Write for circulars and prices.

Manufactured only by

H. C. Marsh
606 Race Street
Rockford, Illinois



AMERICAN CARPENTER AND BUILDER

The Largest, Best and Most Practical Trade Journal in the World for the Carpenter and Builder

American Carpenter and Builder

(Application made for entry at the Chicago Postoffice as second-class matter.)

WILLIAM A. RADFORD, EDITOR.

Published monthly by

American Carpenter and Builder Company.

196 FIFTH AVENUE, CHICAGO.

O. F. BYXBEE, General Manager.

NEW YORK OFFICE, 253 BROADWAY
EGBERT DAYTON, Manager.

VOL. I. AUGUST, 1905. No. 5.

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*, and prompt remittance made for all acceptable matter.

SUBSCRIPTION RATES.

One year, $2.00; six months, $1.00; payable always in advance. Single copies, 20 cents.

SUBSCRIPTIONS may be sent by check, express or money order, or registered letter. Make all remittances payable to the American Carpenter and Builder Company. Postage stamps are not desirable, but if necessary to remit them, two-cent stamps are preferred.

The Lewis and Clark Exposition

THE Lewis and Clark Centennial Exposition at Portland, Oregon, is attracting attention from all parts of the world, and it may have the effect of increasing the market for the red woods of Oregon and Washington. This is an excellent opportunity for the states along the north Pacific coast to display their vast timber resources which are often underestimated. As the timber becomes scarcer in the North Central States it will be necessary to turn to the South and the far West, and the exposition at this time gives them the opportunity to display their valuable timber land.

Moderate-Priced Apartments

THE demand for moderate-priced apartment houses is becoming greater in nearly every large city in the country. People who are obliged to work in the heart of the city and who cannot afford to live in the suburbs, must find a home of some kind near their place of employment. The demand, therefore, of moderate-priced apartments in refined localities is becoming greater than the supply. The inevitable result is that many people are suffering hardships and more are living beyond their incomes. The result in either case is bad, and some inexpensive, neat and attractive apartments should be built for their convenience. These would make good homes for this large class of people and also prove a good investment for the builder.

The Age of Porches

FROM time to time new ideas with regard to comfort and convenience appeal to the people, and at present it is the large porch. The majority of people who are erecting new residences want a large porch where they can spend their afternoons and evenings in comfort. It not only makes the home more attractive but it is beneficial to the health of the occupants, as the air on the porch is purer and more refreshing than in the house. Wherever there is available ground space around a house, a porch should be built, as the benefits derived from it far exceed the additional cost of the ground and porch. A suggestion well worth considering by those who expect to build, is to have the porch extend around to the side of the house. This will prevent any inconvenience to those who wish to enter the front door, when there are a number of people seated on the porch. The chairs should all be comfortable, with large arms, as the porch is strictly a place for recreation.

Vacation Time

WHILE thousands of people are planning and worrying where they are going to spend their summer vacation, the carpenters and builders are busy working to erect as many buildings as possible before the cold weather sets in. Just as the farmer plans and figures during the winter months what fields to sow and what ones to leave for pasture, so the carpenter plans for the coming season, and while others are taking their vacations he and the farmer are reaping the harvest planned during the winter months. We must not think, however, that they do not get the benefit of the fresh air and sunshine, for the carpenter, contractor and architect are always in the open air to a greater or less extent, and when winter comes they have as good a tan on their hands and face and a far larger figure in their bank book than the man who, in order to enjoy the sun and wind, must leave has work and try and become brown in two short weeks or less. While at first thought it may seem to the carpenter and builder as though their lot was a rather hard one, it is well for them to remember that they are continually enjoying what others spend time and money to get, and in the end they are not only healthier but also wealthier men.

The Dangers of Cheap Houses

WHEN most people build a house it is with the intention of it being their homes during the remainder of their lives. Does it then pay to erect a cheap structure? When we say cheap we do not mean small, for a small house is not necessarily a cheap one. What we mean, is a poorly constructed and ventilated house, where the outside appearance may be neat and trim but the construction underneath the plaster is poor. The fresh-water pipes and the waste pipes are often so close together that a leak in the one may carry disease to the other. Chimneys are often poorly constructed and gas fumes escape which are always a menace to human life, besides the danger of fire caused by the woodwork being in close contact with a defective chimney.

When these various things are considered and the constant danger one is in, it can readily be understood that a cheap, that is, a poorly constructed house, is a source of discomfort and does not pay.

The best remedy for this is, to put the construction of your house into the hands of a good, practical carpenter and builder. These are the men who can remedy the defects found in many of the homes, and the great majority of them take an honest pride in their work and construct houses which are hygienic, safe and artistic.

A Profitable Convention

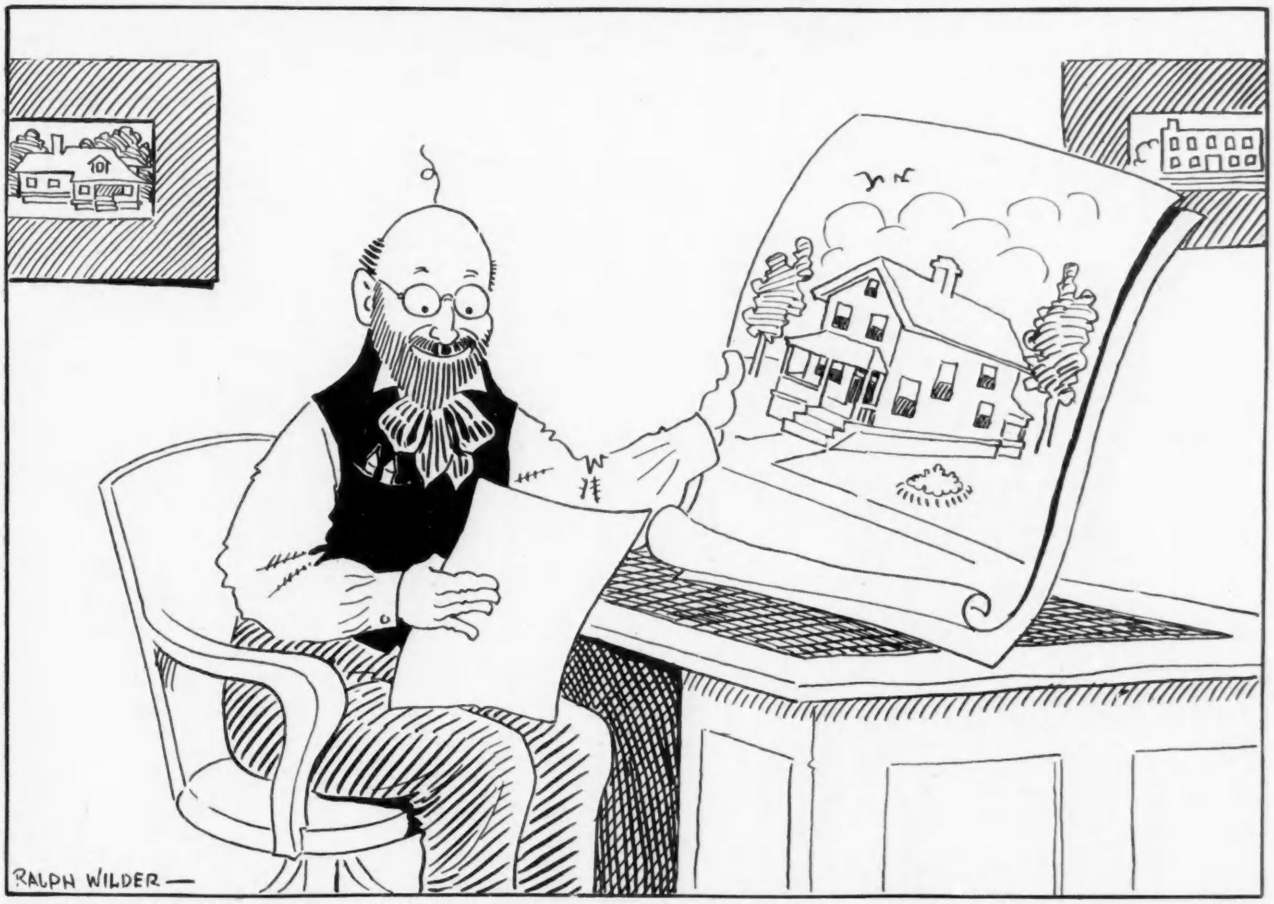
IT IS seldom that conventions of dealers or manufacturers accomplish much that is of real practical value to those who attend, but the recent meeting of the new Concrete Block Machine Manufacturers' Association, at Chicago, was a notable exception. The members came together for business and every session was devoted strictly to business and profitable discussion of the questions which arose. Members were busy taking notes of the points made by speakers, and the evident willingness of members to give the results of their experience to each other along all lines was certainly commendable.

Aside from the interchange of ideas and experiences in reference to the technical details of the construction of concrete blocks, there were two important questions which claimed the attention of the convention. These were the insurance of buildings built of concrete blocks, and freight rates on the machines in which the blocks are manufactured. Energetic committees were appointed to pursue both questions further, and their work will undoubtedly result in much financial benefit to the members of the organization, and settle these questions, which, in their present uncertain condition, have done much to hinder the progress of cement block buildings, which, however, notwithstanding any hindrances, are becoming more and more in demand.

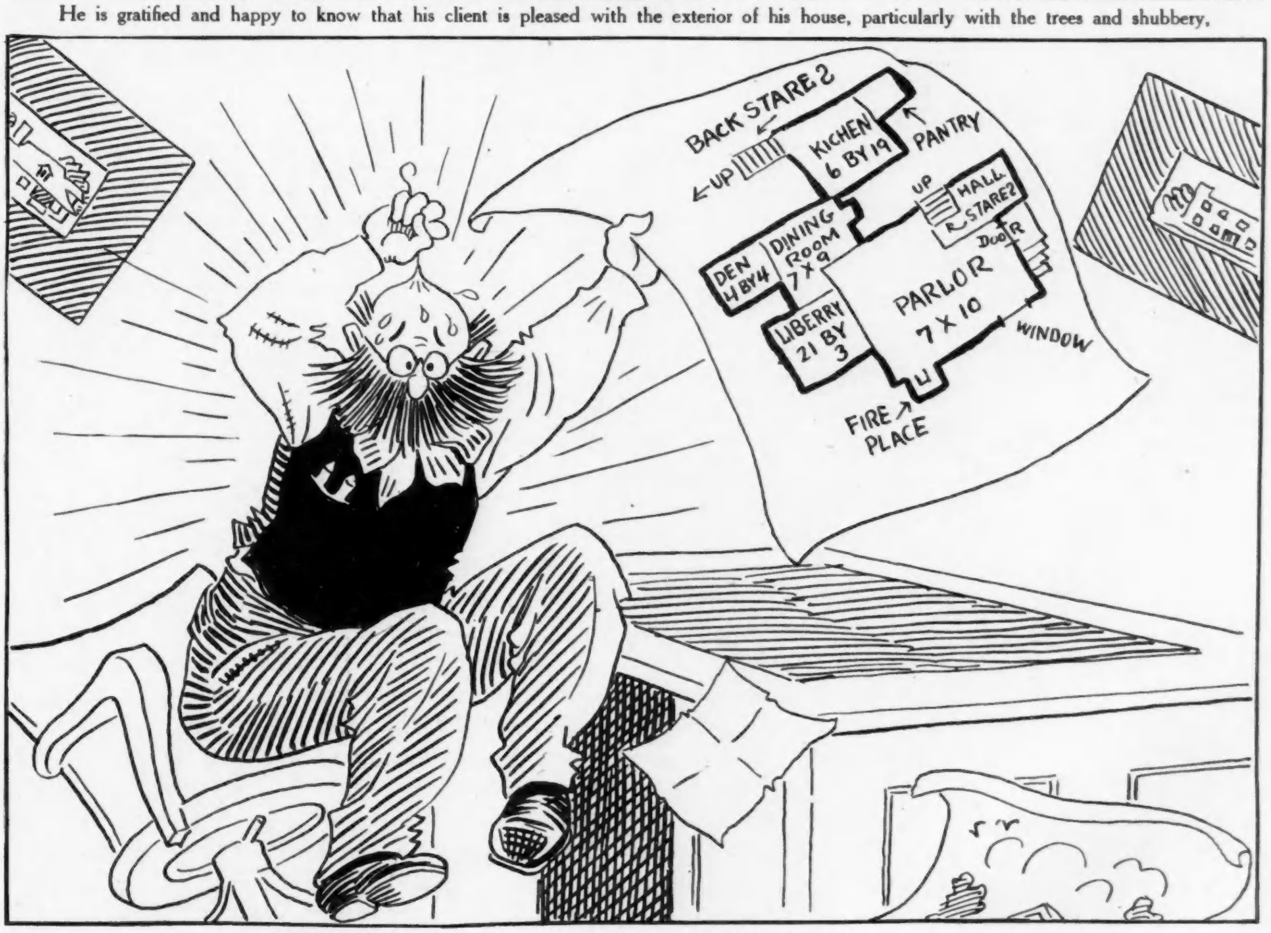
Another question which developed at every turn in the discussion was the necessity of conveying to architects, builders and the public generally a better knowledge of concrete blocks and their advantages, and to the purchaser of the machines, and also the agent of the machines, a clearer understanding of the proper way to construct the concrete block, and general information on the handling of both machines and blocks. While the importance of this question was apparent in almost every discussion, the lack of knowledge being frequently referred to, yet no definite action was taken.

It is necessary for the manufacturer of the machine to go further than to attempt to create a demand for the machine; he must create a demand for the product of the machine—the cement building block. This cannot be done by the distribution of circulars to persons who inquire regarding machines—these people are already interested in the subject. It is necessary to provide some means of reaching and interesting the person who is not interested. Advertising the machines in trade journals is not sufficient. It is necessary that the trade journal publish articles on the uses of concrete, on the proper construction in all its various details, and the proper proportions of ingredients of the concrete block, on fireproofing, on reinforcing, and all other kindred points. The manufacturers should appoint a committee whose duty it would be to supply information, answer inquiries, and furnish articles for the trade press, and for magazines and newspapers in general. The editor of a trade journal, no matter how practical he may profess to be in the uses of cement, is not as practical as the men who make up this new organization. In their own interests they should place the results of their experience at the disposal of the press. Thus through a more intimate knowledge a demand is created for the cement block, and a demand for the cement block means a demand for the machine in which it is manufactured. The individual manufacturer will then be in a better position to tell of the advantages of his particular machine through the advertising columns of such papers as endeavor to interest their readers in the subject of buildings constructed of cement blocks.

THE ARCHITECT HAS TROUBLES, TOO



He is gratified and happy to know that his client is pleased with the exterior of his house, particularly with the trees and shubbery,



BUT, when he looks at the first floor plan, as revised by the owner — — —

Safe Load for a Truss

HOW TO SUPPORT A FLOOR USED FOR GATHERINGS—RULES FOR COMPUTING STRAIN IN RODS—RODS USUALLY TOO LIGHT

By Frank E. Kidder

WHAT is a safe load for a truss is a question that is often puzzling to one not frequently called upon to do figuring of this character, and we are glad to answer the following question from Mr. Sheaw in considerable detail, as it will undoubtedly be of assistance to many others:

To the Editor: Randolph, N. Y.

Will you state the rule for getting the safe load to be carried by a truss? What the depth should be according to the length. I have a floor thirty feet wide and forty-two long and I want to put in a truss below. I want to truss up a ceiling thirty by forty-two feet, the one thirty feet to go through first and the forty-two to connect them ten feet from the end; and also the forty-two foot one. Now above these a hall which will be used for gatherings of all kinds. How deep will these trusses have to be to be safe? Steel beams will be safer than wood even though the latter be supported by truss rods with turn buckles, will they not? Would the thirty-foot truss have to be double? It would be safer, would it not? Please give me the formula for computing the strength of truss, how deep according to the length. M. W. SHEAW.

As I understand the question of Mr. Sheaw, he wishes to support a floor thirty by forty-two feet by means of trussed girders or steel beams, for if the room above is to be used as a dance hall, the trusses could not project above the floor. The information given is not sufficiently definite to enable one to say exactly what is required. In general we would say that the best way to support such a floor would be by means of girders extending across the building, the narrow way, three girders being used in the length of the building, so that they would be about ten and one-half feet on centres. These girders would support two by ten-inch joists placed parallel with the sides. Each girder would be required to support a floor area of 10½ times 30 feet, which equals 315 square feet. If the floor has a plastered ceiling below, and double flooring, the dead weight, including that of the girder will be about twenty-five pounds per square foot. For a dancing floor the live load should be taken at 100 pounds per square foot at least, which would make a total of 125 pounds per square foot. As each girder supports 315 square feet of floor, it must be capable of supporting 125 times 315, which equals 39,375 pounds.

To support this load with a thirty-foot span will require a twenty-inch, sixty-five pound steel beam, or a trussed girder such as is shown in Fig. 2.

Owing to the fact that the strength of a truss depends as much upon the inclination and arrangement of the individual members as upon their size, it is impossible to give simple rules for figuring the strength of trusses.

For a trussed girder similar to that shown in Fig. 2 it may be said that the depth of the girder, measured from the top of the beam to the centre of the rod or rods, should, for economy, be about one-tenth of the span, and if the depth is less than one-twelfth of the span, the rods will have to be excessively large. As a rule carpenters, in building trusses of this kind generally make the beam large enough, but almost always use rods that are too light, and do not drop the rods sufficiently, so that the trusses sag greatly and often have to be reinforced.

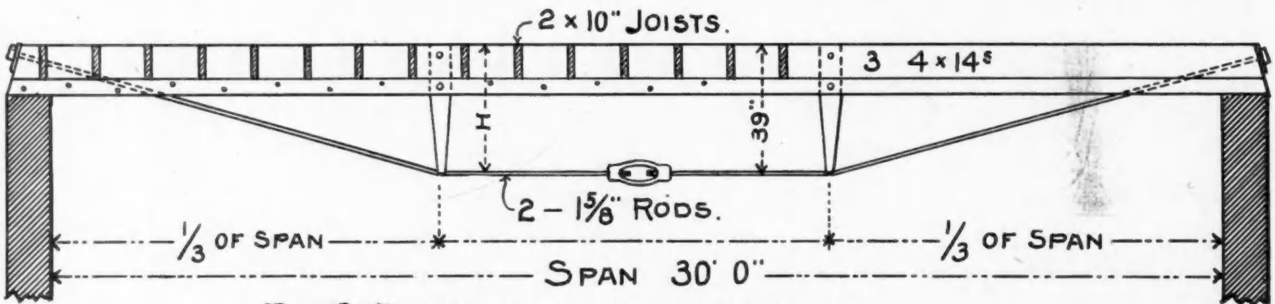


FIG. 2. DETAIL OF TRUSSED GIRDER.
DISTANCE CENTER TO CENTER OF GIRDERS, 10' 6"
SAFE LOAD FOR GIRDER, 40.000 LBS.

When the struts are placed at the *third points* of the span, the strain in the rods may be very closely computed by the following rules:

When the depth H equals three inches plus one-tenth of the span, the tension in the rods is found by multiplying the load on the girder by one and sixteen-hundredths, and when H equals three inches plus one-twelfth of the span the tension in the rods is found by multiplying the load on the girder by one and three-eighths. Knowing the tension in the rods, the necessary size of the rods or rod may be found from a table giving the strength of rods.

The depth of the girder shown in Fig. 2 is three inches plus one-tenth of the span (3 ins. + 3 ft. = 39

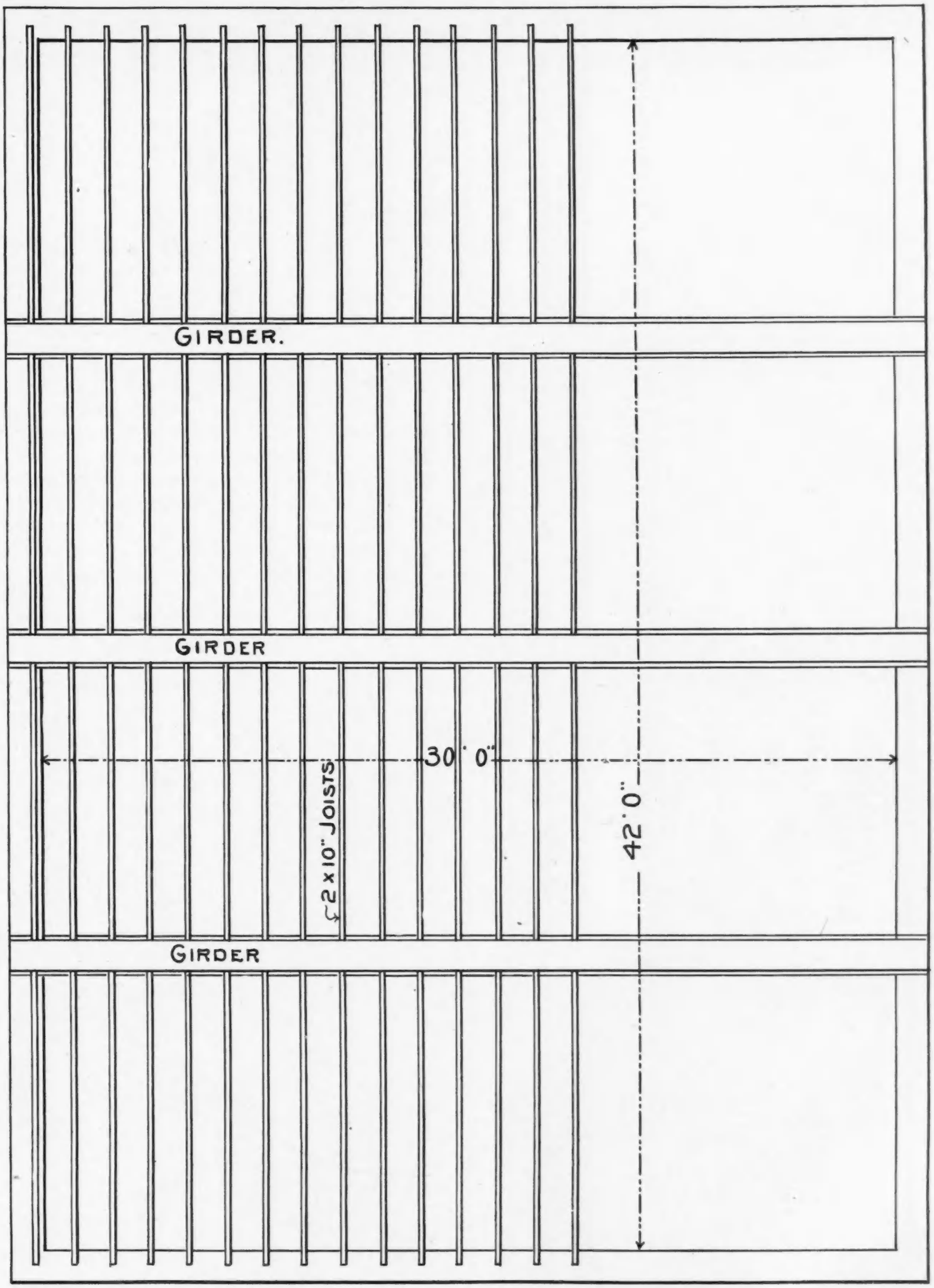


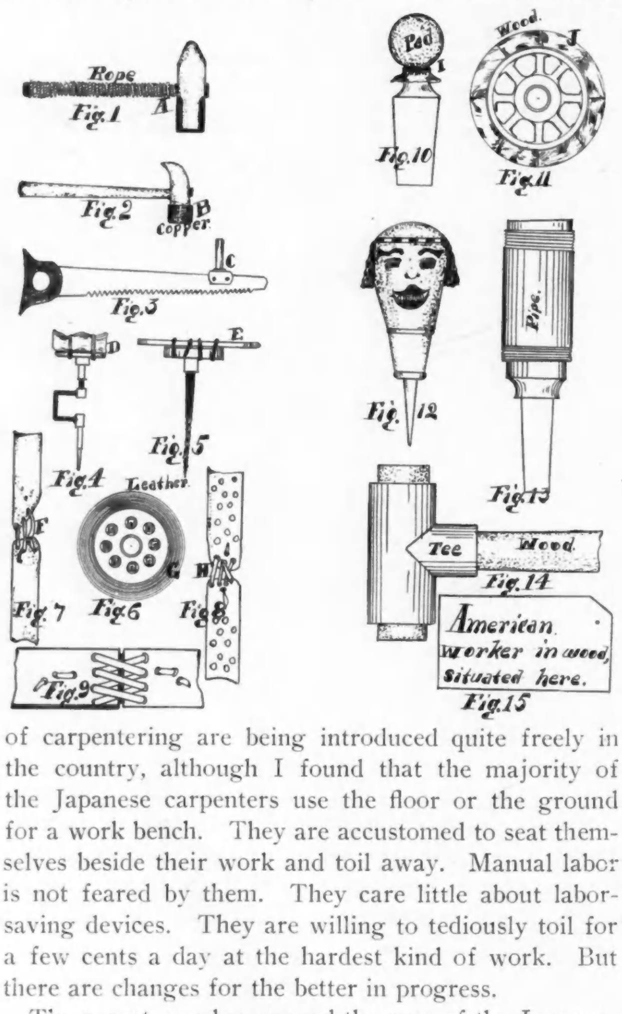
FIG. 1. PLAN OF HALL FLOOR.
SHOWING ARRANGEMENT OF JOISTS AND GIRDER.

ins.), consequently the tension in the rods will be 1.16 times the load, or 1.16 times 39,375, which equals 45,675 pounds. This strain will require two 1⅝-inch rods. If we reduced the depth, H, to 3 inches plus 1-12 of the span or 3 inches plus 2½ feet, which equals 33 inches, the tension in the rods would be 1⅜ times 39,375, which equals 54,140 pounds, which would require two 1¾-inch rods.

American Carpenter's Tools in New Japan

LABOR SAVING DEVICES IGNORED, WHILE SIMPLE TOOLS ARE PURCHASED—CHANGE THEM TO SUIT THEIR OWN REQUIREMENTS

RECENTLY I visited Japan. I was much interested in the attempts of the Japanese carpenters to introduce American-made tools. The Japanese carpenter uses his toes almost as often as he uses his fingers. Consequently many of the tools in use for woodworking are constructed with the idea of utilizing the toes to help out. The American ideas



of carpentering are being introduced quite freely in the country, although I found that the majority of the Japanese carpenters use the floor or the ground for a work bench. They are accustomed to seat themselves beside their work and toil away. Manual labor is not feared by them. They care little about labor-saving devices. They are willing to tediously toil for a few cents a day at the hardest kind of work. But there are changes for the better in progress.

The recent war has opened the eyes of the Japanese carpenter to a great extent, and he is reaching out for more up-to-date tools and systems. I saw many styles of American carpenter's tools in use by the Japanese. As a rule only the simplest forms of tools are wanted or purchased. The highest grade of patented bit-stocks and recent inventions in labor-saving devices are usually ignored, while the simple, every-day tools are liberally purchased. Still the Japanese has a tendency to do a few things to every tool he buys. He wants to make the tool suitable to his particular requirements. In one shop where there were a dozen Japanese carpenters making furniture, nearly all of the common designs of American hammers were wound with cord, like, a, Fig. 1. I asked why, and was told to afford a firm grip to the hands. Then when visiting another shop in Nagasaki, Japan, I noticed that all of the American hammers were provided with enclosed tips, b, Fig. 2. These tips or covers were made of a metal harder than copper, but somewhat softer than steel. I inquired the reason for this capping operation and was informed that the American steel hammer was too hard for use and the softer metal cap was adjusted to break the blow. Then in another carpenter shop where there were many carpenters employed at general job work, I observed an American type of bit and stock in service. Fixed to the disk was a roll of textile fabric, secured with two cords, like, d, Fig. 4. It seems that the Japanese operating this bit-stock was engaged in drilling a series of holes in backs of brushes for the insertion of the bristles. He had to bore one hole at a time. But he worked speedily. In order to make a soft cushion for his shoulder, when applying pressure to the bit-stock, the workman had fixed on the roll of fabric. Then in another case I saw a common form of American boring tool rigged out with a piece of pipe secured across the original handle, as in Fig. 5.

I inquired why this was necessary and the Japanese carpenter told me that he could get more leverage with the longer bar.

And thus are tools altered and adjusted in the hands of the ingenious Japanese carpenter. Even the imported materials used in power and transmission in carpenter shops and other industrial establishments are more or less tinkered with. You cannot find many heavy labor-saving woodworking machines in service at the present time, but you can find evidences of preparations for modern machinery. In some of the advanced provinces quite up-to-date American devices are already used. The average Japanese carpenter is careless in the use of these imported boring, planing, sawing and other machines. In one shop, where several American machines were in service, the machines were greatly handicapped by poor belt lacings. In one case the belt was flimsily connected at the union with a few strings of lace leather, as at, f, Fig. 7. Every time this part of the belt contacted with the driving wheel it slipped and made bad work. Then on another machine I found that the original driving wheel was lagged up with leather belting, as at, g, Fig. 6, so that the speed was reduced about one-third. In another case, I found that the leather belt of a certain woodworking machine was punched full of holes, as in Fig. 8. I asked why, and was told that this was to make the surface of the belt rough, so that it would not slip over the smooth surface of the driving wheels. This belt was also poorly joined, as at h. In Fig. 9 is the way we showed the Japanese carpenters how to properly make the belt unions for a high speeded American machine. The Japanese carpenters are great fellows to make soft pads for tools when the tools have to be manipulated by the crude hand-systems employed. In Fig. 10 is a sketching of a chisel-shaped tool, and the soft pad is formed by binding kid with a cord, i, to the top, packing the kid with hair. Fig. 11 is an illustration of one way used by a Japanese carpenter to make an iron wheel larger than its original diameter. Lags of wood, j, were tediously sawed out to fit about the circle of the wheel and each lag was then secured by passing screws through holes bored in the rim.

The Japanese carpenter likes to sit down during the noon hour and devote his time to engraving his signature or sign on the handles of his tools. Fig. 12 is a drawing showing one mark employed. In this case, the workman evidently devoted considerable time to the proper engraving of the figurehead in the hard wood. Very many imported tools are thus engraved. The Japanese carpenter is noted for patching out tool handles, to bring the tool up to his idea of usage. For example, in one province where I visited, I noticed that the workmen had had access to considerable wrought iron piping.

Sections of this pipe would be taken and used as handles for tools. In some cases the metal covers are slipped over the former wood handle. Fig. 13 illustrates one system employed. The pipe section is driven completely over the wood handle. I inquired why, and was told that the pipe portion would prevent the wood handle from splitting. An ingeniously made hammer is shown in Fig. 14. The Japanese workman secured a tee and with this article he constructed the handy hammer. First he shaped a hardwood handle. This he inserted tightly into the tee as shown. Next he obtained a cylinder of copper and inserted this cylinder through the tee as illustrated. All through Japan one may see the signs indicating that American tools are sold or that some one is working in wood on the lines of the American carpenter, as in Fig. 15. In this case I found that a sailor had stopped with the Japanese workman a week or two and had given the Japanese lessons in American methods of carpentering. On the basis of this speedy instruction, the Japanese carpenter was securing quite a patronage. There is a decided liking to American tools, customs of work, language, etc. No doubt, after the war, the tool market in Japan will be much larger than it is. There is a great future in Japan for American-made tools.

The American manufacturer will have to allow for tinkering work on his tools for some years to come, no doubt. American saws are wanted particularly. Yet the Japanese carpenter is sure to make some unnecessary alteration in every saw he buys. I saw a high-grade American saw denuded of its handle and a handle of the design show in Fig. 3 put on. This was a long saw and the workman rivetted the additional handle, c, to it as shown. I inquired why, and was told that this was for the boy to take hold of and help out in sawing lumber.

Painted Paper for Steel

All who have had to do with steel construction understand the difficulty of painting a clean steel surface in such a manner that it will afford anything approaching permanent protection. After an exhaustive series of experiments, extending over a period of ten years, an eastern railroad has hit upon a plan that has given excellent results and seems to have solved the long vexed question.

By this system, the metal, after it has been thoroughly cleaned, is covered with a single coat of some decidedly sticky substance which holds tightly and permanently in place a layer of paraffined paper, which is placed over it. This paper is then painted. Where rivets are employed, holes are cut in the paper to admit of their passage, their heads being covered with caps of paraffined paper. At first blush this might look like an expensive operation, but in reality it costs little more than the application to the steel of two coats of pigment in boiled linseed oil, since the work is all done at one setting, of the scaffolding, the other process requiring two. Another advantage is that any desired color may be employed, while the results are permanent, there being no scaling off as is the case with painting directly on metal.

Hints to HouseKeepers

Don't put little unsafe tables near the center of a room, where they are likely to be upset by any chance passerby. If you do, don't blame any one but yourself when the things on them get smashed.

Don't draw your curtains half across the windows in the daytime. Windows are intended for the entrance of air and light, health givers which no one can afford to exclude.

Our Share, 90 Per Cent

We are pleased to say that 90 per cent of the answers we receive from our advertisements come from your publication.—Laanna Manufacturing Co., Philadelphia.

STEEL SQUARE

ALFRED W. WOODS

The Steel Square and Its Possibilities

V. SHOWING HOW TO APPLY THE STEEL SQUARE TO OBTAIN THE ANGLES FOR PRACTICAL AS WELL AS FOR ORNAMENTAL DESIGNS IN MECHANICAL CONSTRUCTION

BEGINNING where we left off in our last article, we have one more pentagonal illustration as shown in Fig. 23, we wish to present before passing on to some of the other polygons. We could go on and show other positions of the steel

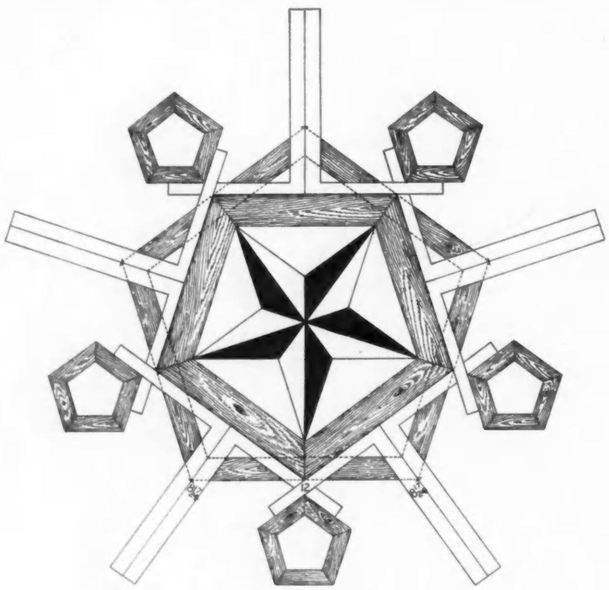


FIG. 23.

square in forming the pentagon and its miters, but the figures used on the steel square would conform to the figures here given or to their ratio. We will now call the reader's attention to some of the other polygonal figures, applying the same rule as for the pentagon or five-sided figure.

The triangle and hexagon are the only polygons whose miters can be had on the same degree line, which permits of using the same figures on the square as shown in Fig. 24. In this, we show two squares with but one degree line, which is 30 degrees on the square No. 1 and 60 degrees on square No. 2 and both giving the same cuts but reversed on the squares. Perhaps this point could be made more clear by using but one square as shown in Fig. 25. In this, the degree lines are shown for the 30 and 60 degrees and both giving the miter for the triangle. The tongue giving it in the former and the blade in the latter. In this example, we show how to lay off a triangle of any inscribed diameter by setting off the radius, say 2½ inches on the blade as shown, and squaring out to the degree line as at "A." Then with the length from 12 to "A," set off on the tongue will locate the center as at "B" or vice versa if the cut is wanted on the blade.

In Fig. 26, we show a circle with the degree divisions spaced on same with the aid of the steel square. We do not claim this to be the best way, nor would we use this method if we had a job of this kind to do, but it can be done and that very accurately by letting 12 on the tongue rest at the center and checking on the blade as follows: 2⅛, 4⅜, 6 11/12, 10 1/12, 14 7/24 and 20 19/24 inches, which places the degree lines ten degrees apart. Then swing the square till

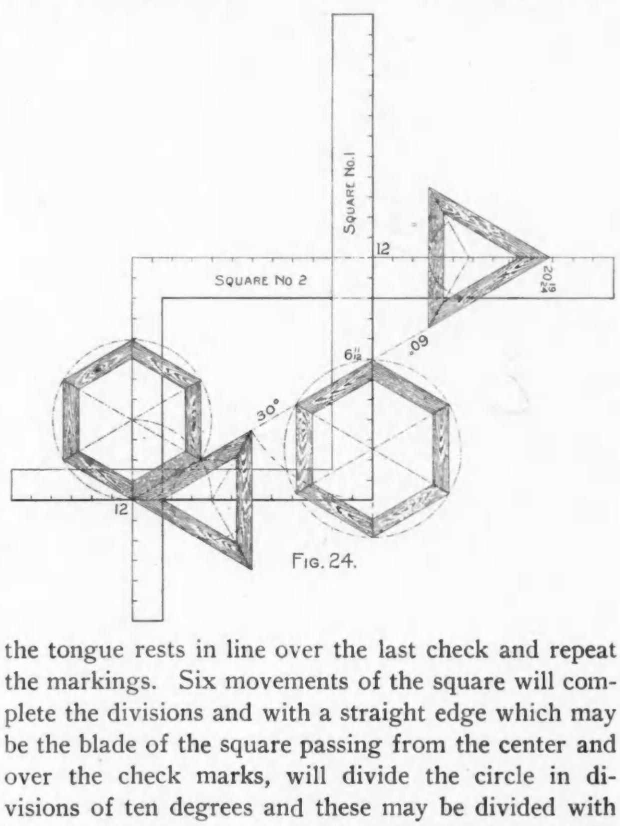


FIG. 24.

the tongue rests in line over the last check and repeat the markings. Six movements of the square will complete the divisions and with a straight edge which may be the blade of the square passing from the center and over the check marks, will divide the circle in divisions of ten degrees and these may be divided with a compass into ten spaces, designating the degrees. Of course, the whole circle could have been divided with the compass by first dividing the circle into quarters or sixths and these spaces again into the required divisions, but the reader will understand that we are illustrating what may be done with the aid of the steel square. However, it will not be out of place to show what may be done with the compass alone in laying off the degrees on the circle as shown in Fig. 27, and may be drawn as follows:

With the compass describe the degree circle and without changing the radius, set the needle point at any place on the circle, describe another circle and

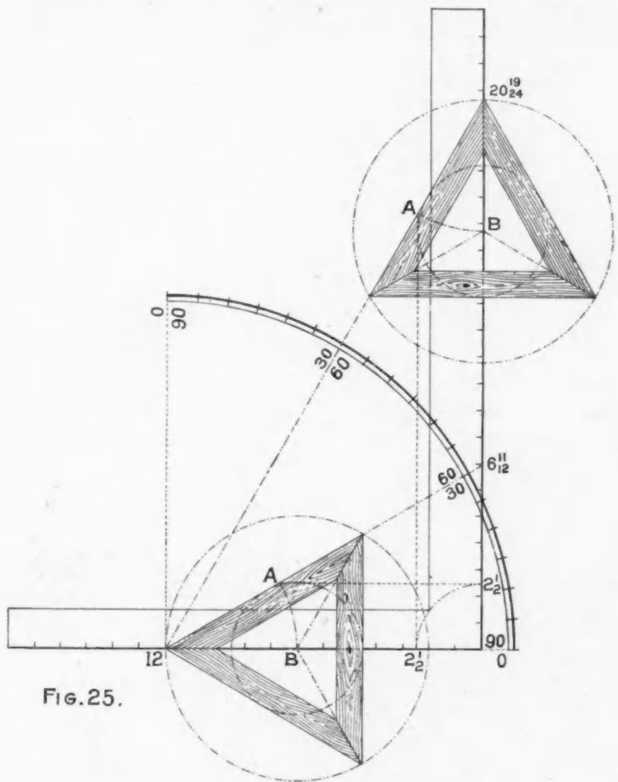


FIG. 25.

at the intersection with the first circle, describe another circle and continue until all of the intersections have been used; then with a straight edge lay off the lines through the center to the intersection of the points of the outer circles. It will be seen that the degree circle has been divided into twenty-four equal divisions or 15 degrees apart. These divisions could be again divided in like manner down to 5 degrees by setting the needle point at one-third of the space on the circle and thereafter on the intersections as described above.

In our first article, we said that it was in the division of the circle that the whole subject of miters is founded, whether regular or irregular and we believe there is no better way of illustrating this point than as shown in Fig. 28. If there is any one of the illustrations that we feel a little bit prouder of than the others, it would fall to this one. So far as we know we were the first to give this form of illustrating the different miters to the public through the medium of a trade paper published in May, 1895. Mr. Fred T. Hodgson in his revised work on the steel square, gives this illustration along with a number of others, for all of which he gives the writer due credit.

In this figure are shown a number of the regular polygons. Here they are beginning with the triangle in their order up to twelve, then they skip to fifteen

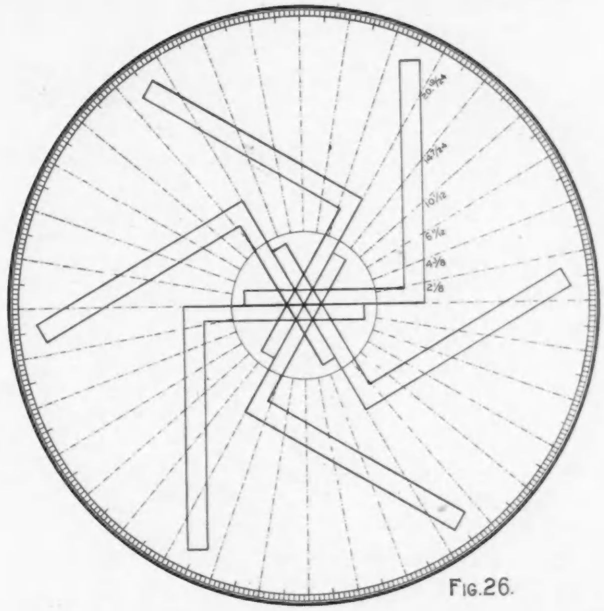


FIG. 26.

and they could keep on growing in number of sides until their lengths would represent only a very small fractional part of an inch. There is a whole lot of practical information that may be gathered from this illustration, but after all, it is only a repetition of what may be obtained in Fig. 4 of the May number,

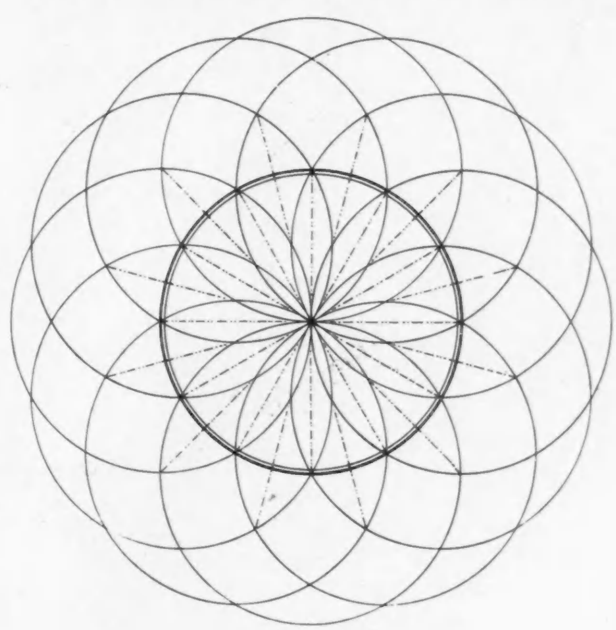


FIG. 27.

but in this the polygons are singled out and illustrated in the degree circle.

By dividing 360 (the number of degrees in a circle), by the number of sides in the desired polygon will give the angle that the miters stand with each other, but in order to obtain the angle on the steel square, it is only necessary to divide 180 by the number of the sides in the polygon and the quotient will represent the angle in degrees to use on the steel square to obtain the miter. The blade giving the cut. The figures used on the blade also give the length of the sides of the polygon when the inscribed diameter is one foot. square, none of them varying over .02 of an inch. Polygons are known by the number of their sides as per the above names given in their order up to the twelve sided figures, after that with the exception of fifteen which is called quindecagon are known as polygons of so many sides.

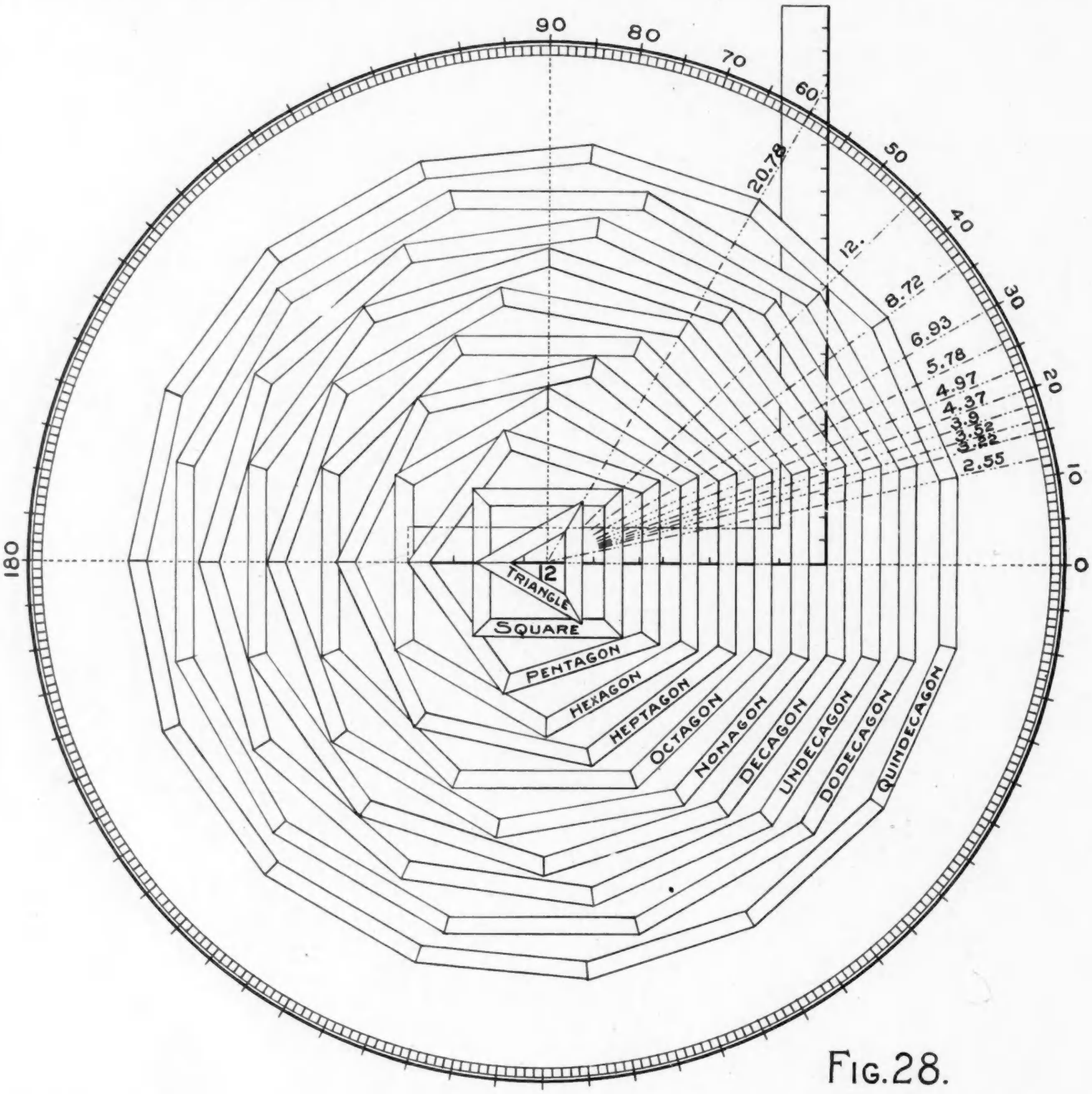


FIG. 28.

These figures are also used for cuts in roof work which we will refer to later.

The following fractional numbers represent the value of the decimal numbers shown on the degree lines and are the figures to use on the blade as follows: triangle, 20 19/24; square, 12; pentagon, 8 17/24; hexagon, 6 11/12; heptagon, 5 19/24; octagon, 4 23/24; nonagon, 4⅜; decagon, 3 11/12; undecagon, 3½; dudecagon, 3 5/24; quindecagon, 2 13/24.

These fractional numbers are to the 1/24 part of an inch and are about as near as can be had on the steel

In some of the encyclopedias the triangle and square are not classed with the polygons but we see no reason why they should not be, since the rule that applies to other sided figures applies to them also.

The subject of polygons is not as well understood as it should be. It is quite a common thing to call most any kind of a corner aside from the right angle, an octagon corner, due no doubt to the fact of their little demand in practical work, for, aside from the octagon, they are but little used. However, it is well to know them and to know one is to know them all.

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 PAINTFR

IN THE East, spruce and hemlock are commonly used in the framework of cottages, and occasionally oak in the better class of buildings. In the South and West, other materials indigenous to the particular locations are employed.

Fig. 28 shows the use of shingles for the exterior covering of a house, and Fig. 29 illustrates the use of clapboards.

Fig. 30 is a section showing the construction of the framework at the first tier of beams. The main sill is the first piece of timber to be put in place, and should be well bedded in mortar on the walls so that it may have an even bearing at every point. It should have a halved joint at all corners, and if splicing is necessary, it should be done by means of a scarfed joint. These and other joints used in framing will be fully illustrated and explained in a future number. This cut also shows a base course of shingles. Three forms of base courses, where clapboards are used, are shown in Figs. 31, 32 and 34.

At "A," Fig. 32, is shown a fire stop of bricks laid between the floor beams, which should never be omitted. It also serves as a stop for wind and vermin. It is frequently built on the sill as indicated by the dotted lines at "B."

Fig. 33 shows an isometric view of the base of the framework.

Fig. 34 shows the cross bridging between the floor beams. There should be a row of cross bridging for every eight feet of span. This cut also shows the studs mortised into the sill, a constructive feature only used in the best grade of work.

Fig. 35 shows an elevation at the corner of a building, from the sill to the rafters. The girts are mortised and tenoned into the corner posts and pinned with hardwood pins. The braces are mortised and tenoned into the corner posts, sills, girts, and plates, and are pinned with hardwood pins.

The second tier of beams are notched over the girts. the ribbon strips, or ledger boards, as they are also called, are notched one inch into the studs, braces, and posts, and should be well spiked. The third tier of beams should be notched over this ribbon strip.

All timber should be sound, well seasoned, and free from any imperfections materially impairing its durability or strength, and should be set with the crowning edge up.

Care should be exercised in framnig so that important timbers will not require cutting for pipes, chimneys, etc. All timber should be kept at least two inches from the outside of the chimneys, and in no case allowed to rest on the chimneys.

New Glass Building Material

The French people are among the most saving and economical of all on earth, permitting little to go to waste that can be turned to useful account. This extends beyond the management of their domestic affairs and pervades their very industries. M. Garchy, a distinguished French scientist, has devised a process for melting all kinds of old glass and transforming it into material said to be as hard and serviceable as Belgian blocks.

M. Garchy discovered this process, or at least the rudiments of it, many years ago, but, like a prudent man, kept it a secret until he had fully and satisfactorily developed it. In 1898 the municipal authorities of the city of Lyons granted him permission to employ his new material in paving a portion of one of the principal thoroughfares. Though subjected to the wear incident to an enormous traffic, the glass is still as sound as when it was laid, nearly seven years ago.

The inventor claims that "ceramocrystal," as he has named the new product, can be manufactured at a lower price than any other reliable building material now on the market, either in Europe or America, and that it is superior to any of them, being practically indestructible. It is said to be decidedly attractive in appearance and susceptible of being employed in highly artistic ways. A vast amount of glass now goes to waste in this country, and M. Garchy's process is well worth a critical investigation on the part of enterprising manufacturers.

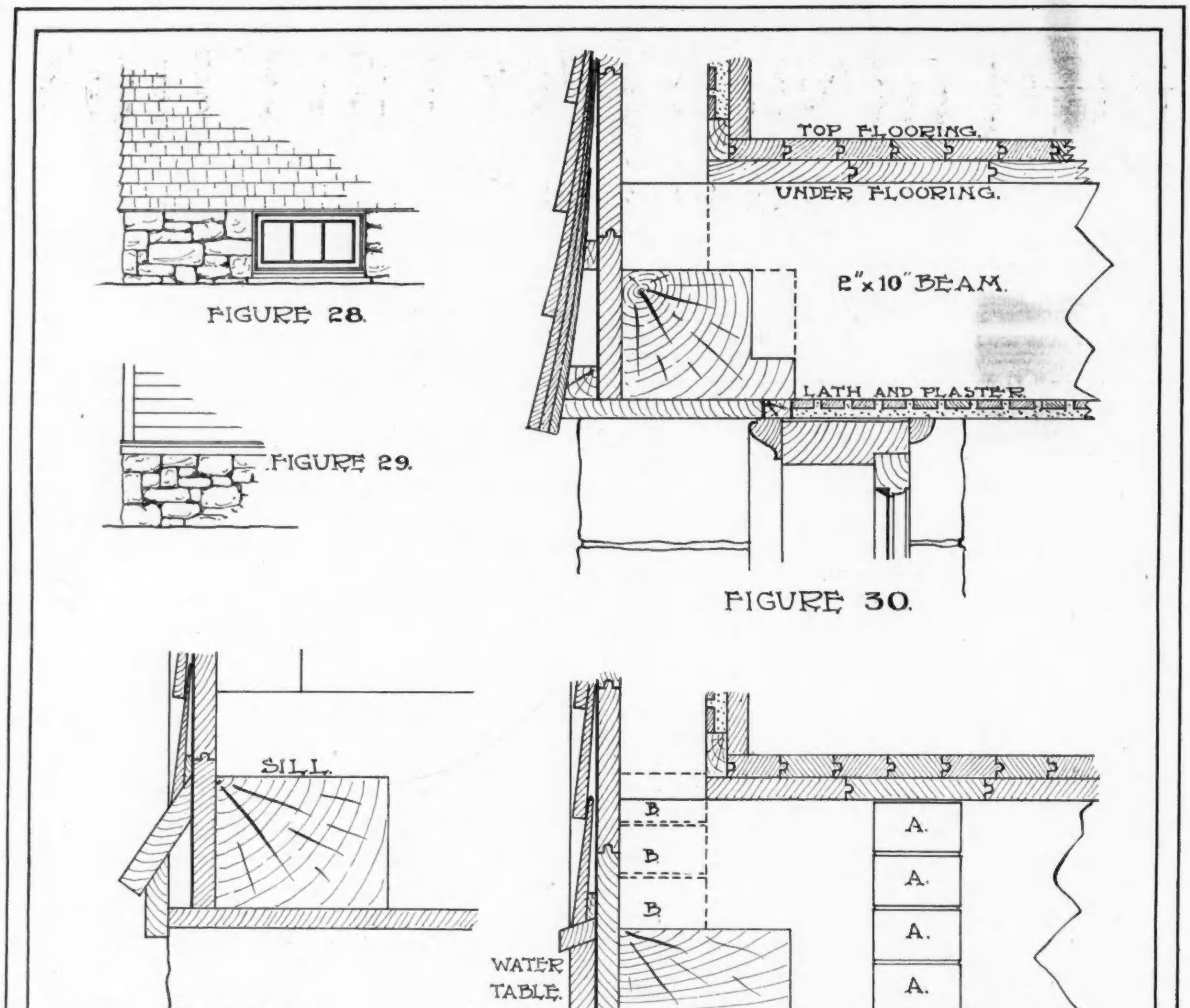


FIGURE 28.
FIGURE 29.
TOP FLOORING.
UNDER FLOORING.
2"x10" BEAM.
LATH AND PLASTER.
FIGURE 30.
SILL.
FIGURE 31.
B
B
B
A.
A.
A.
A.
WATER TABLE.
FIGURE 32.
FIGURE 33.
FIGURE 34.
PLATE IX.

FRAMING.

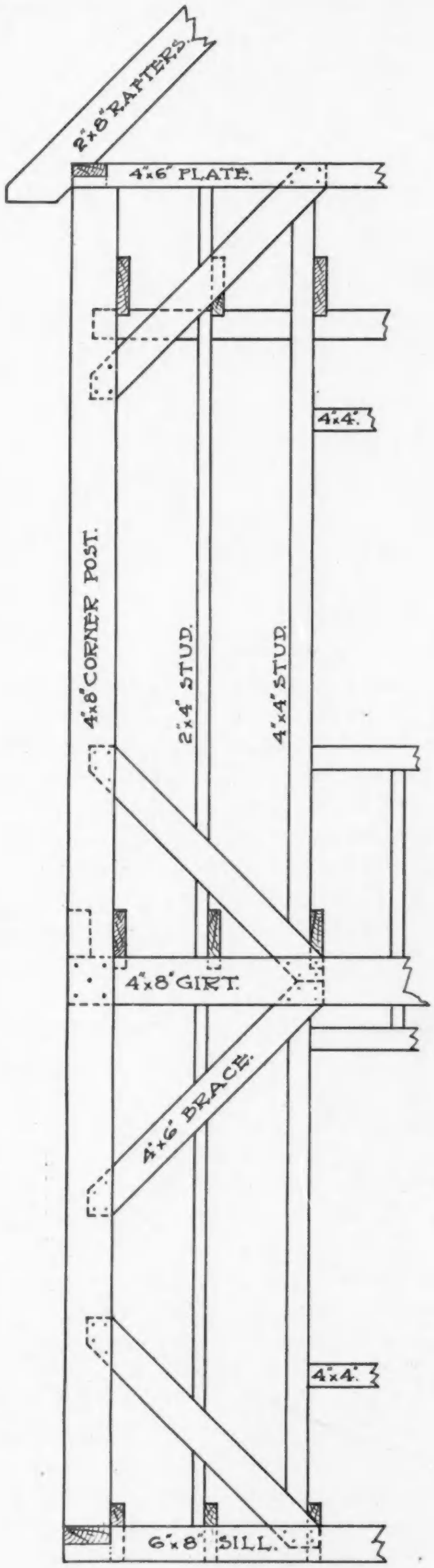


FIGURE 35.

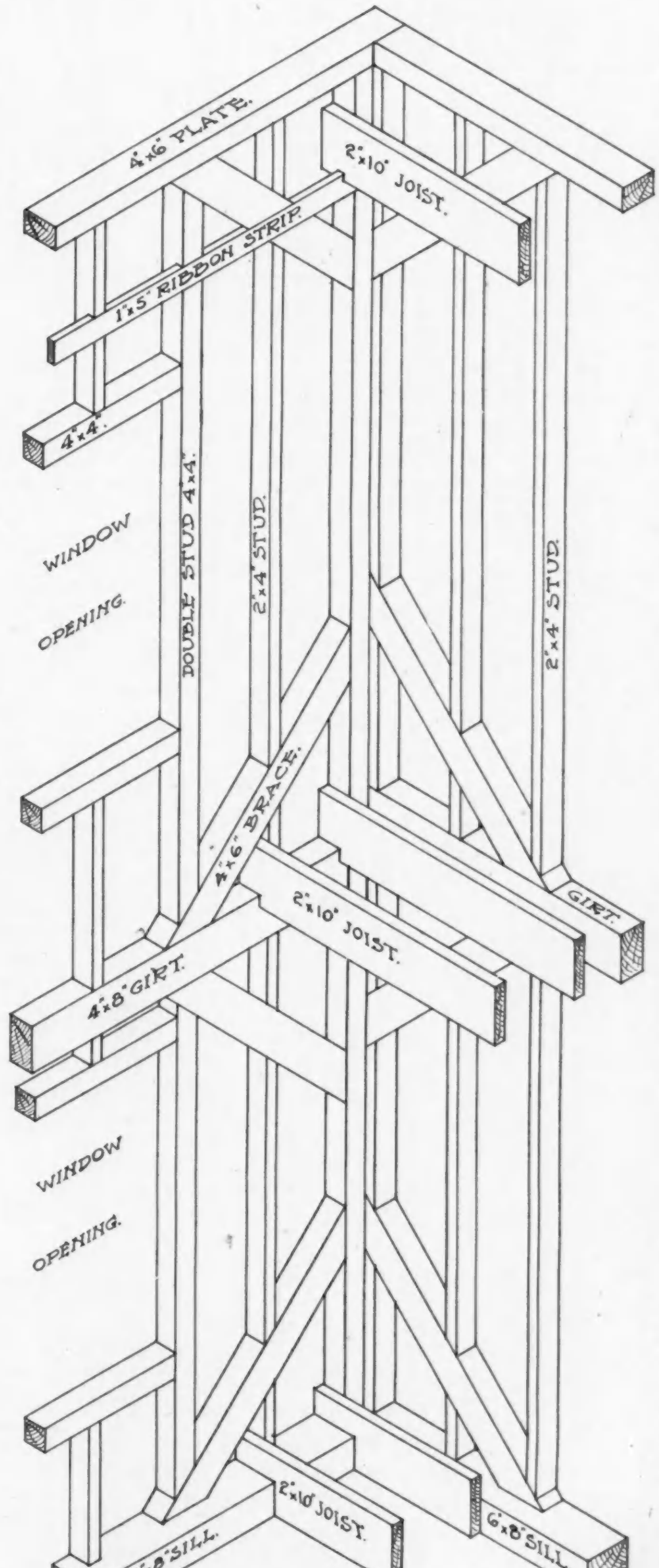


FIGURE 36.

PLATE 10.

FRAMING.

FRAMING A HOUSE

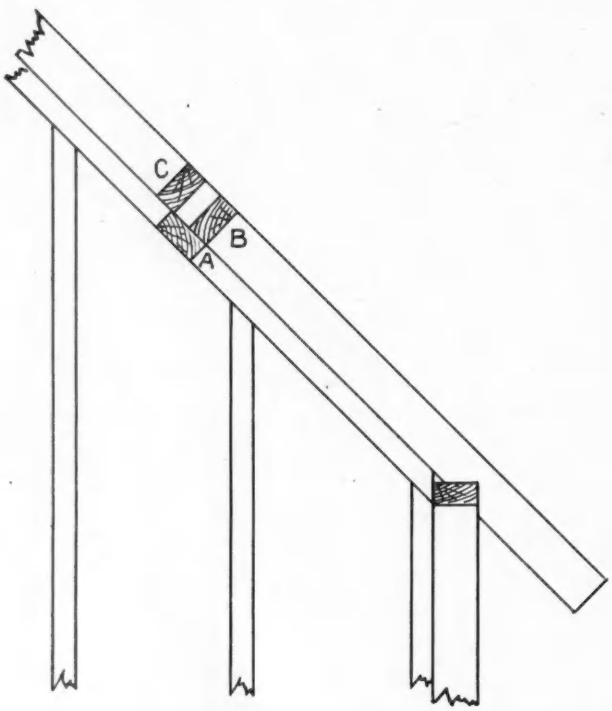
I. P. HICKS

Building Construction

METHOD OF FRAMING RAFTERS AND GABLE STUDDING TO SAVE TIME AND GET BETTER RESULTS FROM YOUR WORK—BEST METHOD OF PUTTING ON CORNICE

WE have a little matter of detail in building construction that has annoyed and vexed the carpenter ever since houses have been built with gables, which were plastered up the rafters from two to four feet in order to get a sufficient height to the ceiling in the center.

Every carpenter is familiar with the disagreeable job of cutting in small pieces of studding between the gable studding along up the rafter, and the difficulty experienced in nailing the small pieces. This work, on some houses, will require a large amount of time, and contractors cannot afford to put in time where it is not needed. There is a much easier way of doing this without the use of more material and with less expense to the contractor, and resulting in a much better job. With all these advantages it looks as if the carpenter or contractor ought to know better and take advantage of an easy way of doing a good job.



After the gable rafters are raised, before putting in the gable studding, cut in a piece of a two by four long enough to extend from the plate up the roof as far as the rafters will be plastered. Put it in flat way directly under the rafter and flush with the outside of rafters, as shown by A and B in the sketch. By doing this all those short pieces which are required in the old way are put in at once, with only one cut to make, whereas the old way may require six to eight cuts.

After the two by four, A, is put in under the rafter, then cut in the gable studding in the usual manner. At B is shown a short rafter which need extend only so far as the plastering goes, and which should be set as shown in the sketch to receive the lath that are nailed to the studding. This is not an extra piece, for by the old method it should be there just the same. The improvement is in putting in A in one piece as shown, thus doing away with a large number of small and troublesome pieces to cut and nail between the studding, along up the gable.

PUTTING ON CORNICE

In this age of close competition, contractors cannot afford to work on a building to a disadvantage. In putting on cornice it is customary for two men to work together, this is all right so far as it goes, for one man cannot handle long boards to any advantage.

With many contractors it is the custom to work one good man and one helper, just to hold the boards while the other man does all the cutting and fitting. We do not believe this is profitable for the reason that the man who has about all the work to do is obliged to climb and chase around from one end of a board to the other, and watch every joint and corner to see that it is right. This makes it twice as hard for him and consumes much more of his time than it would if he had a man to help him who was equally as good as himself. Either man could then cut and fit a joint whenever necessary. In this way one would not be obliged to wait for the other so much. In putting on cornice one has to wait for the other more or less, but this is unavoidable.

On the average job we believe that three men working together will accomplish as much as four men working in pairs. The way to work three men is to have the man who understands the cutting best, work on the ground making all the cuts and passing the boards up to the two men on the scaffold to nail on. The boards can be passed up and down and cut on the ground much quicker and better than they can on the scaffold. The men on the scaffold should of course have a saw and square and occasionally cut a board for themselves when they can just as well as not, but mainly let the man on the ground do almost all of the cutting. If he understands his business he can make nearly all the cuts right the first cut and keep the two men on the scaffold constantly at work, and there need be but very little loss of time on account of one waiting for the other. In our opinion this way of working is far more satisfactory than the way men usually work at putting on cornice.

Modern Club House

VARIOUS THINGS TO BE CONSIDERED B FORE BEGINNING THE PLAN—WHY SPECIAL DESIGNS MUST BE MADE TO SUIT LOCAL CONDITIONS

IN DESIGNING club houses there are many things which must be very carefully studied in order to secure the best possible results. First, the requirements of the club, which may vary greatly according to the purpose of the club or society which is to occupy the building. This being carefully noted the next thing to consider is the amount the association may wish to spend for its construction, and with this information as a basis the designer can, after carefully considering what kind of building materials, system of construction, etc., would be most appropriate for this particular building, determine the amount of floor space suitable for the various rooms, halls, etc. The size of the rooms having been determined, their location must be decided upon. This is one of the vital points in making a convenient building, and not only the relative position which one room must have to another, but the entire surroundings must be taken into consideration, with due reference to the points of the compass, slope of the grounds, location of the thoroughfare, etc.

The general arrangement of rooms will somewhat determine the outline of the building, and with this outline the exterior is designed in harmony with its purpose and surroundings. Hence a club house designed for particular requirements, to be an ideal building, must also be designed for a particular place, and thus the building we hereby illustrate has been designed for a social club, to be built in a suburban town, where the moderate cost of ground will permit having a lawn around the entire building with a background of large shade trees. The pure, white, colonial architecture gives the building a very pleasing appearance.

Referring to the plan of the main floor, it will be seen that the auditorium and stage has been so arranged that it can be entered independently from the other departments, so that the club can rent this part of the building for entertainments, lectures, etc. In this way it will yield a large revenue for the maintenance of the club. The bowling alley has been placed in the basement, not only to make it a cool room in summer, but so as to deaden the sound, and its being separated from the auditorium by a hollow and furred twenty-inch stone wall, thus completely prevent any noise of the bowling alley reaching the auditorium.

The main floor also contains parlors, a large reception hall, billiard room, etc. The second floor has the dining and banquet room, reading room, men's smoking room, balcony, etc. The top of the building has a roof garden surrounded by a colonial balustrade and can be covered with an awning if so desired.

An Immense Dry Dock

That these are the days for the accomplishment of great undertakings is being demonstrated almost every day, the achievements of yesterday being constantly discounted while broader and brighter future prospects constantly unfold. There is nothing romantic about a dry dock, yet when one breaks the record of the world it cannot fail to arouse interest, even on the part of those who never saw one of those highly necessary structures.

The largest floating dry dock in the world was recently completed at the Maryland Steel Works at Baltimore. The work was done for the United States government and the dock will be towed to the Philippines, a sailing distance of 14,000 miles. For more than two months 400 men were employed in cleaning the 1,500,000 square feet of steel plates that make up this immense floating dry dock.

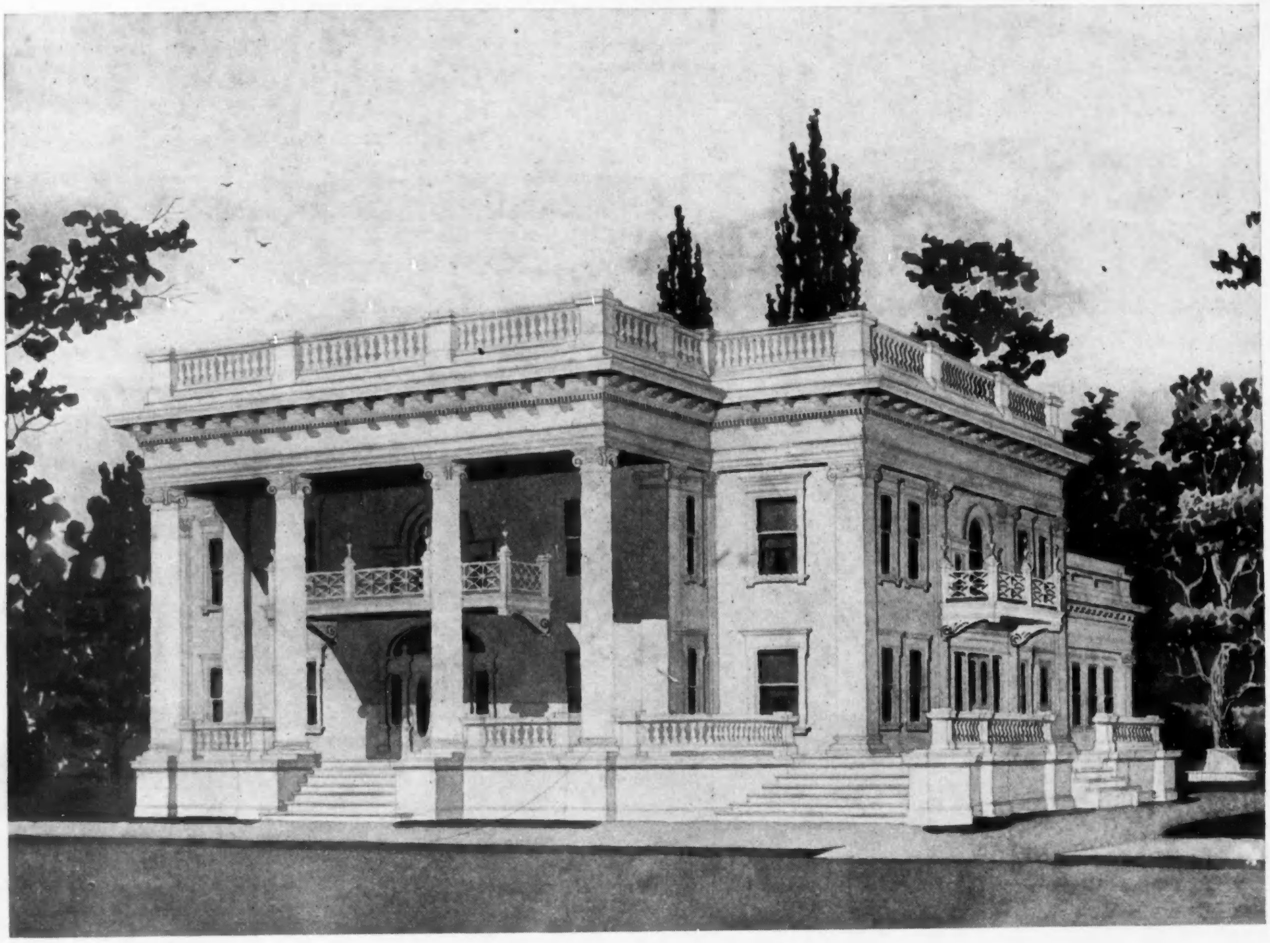
The dock weighs 11,000 tons and was built to accomplish gigantic tasks. In the contract it is stipulated that it shall lift a 16,000-ton battleship. If it proves a success, as there is no reason to doubt, it will be started on its long journey to our eastern possessions, where its services are sadly needed.

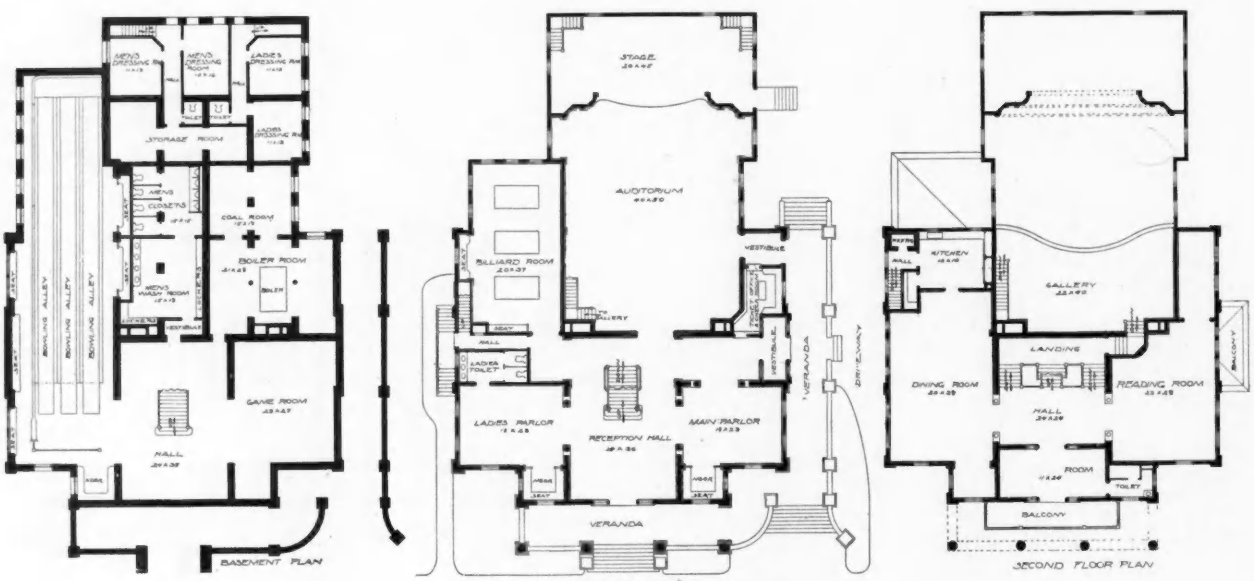
Valuable Information

In looking through the AMERICAN CARPENTER AND BUILDER I find it replete with interesting and valuable information to the carpenter as well as the builder, and I consider it pre-eminently one of the best publications devoted to the interests of the building craft published.—W. F. Thomas, Shreveport, La.

Speaks from 35 Years' Experience

Your paper is the best publication for practical builders that I have ever seen in thirty-five years' experience, and I hope you will keep it up to the present high standard.—S. T. Bennett, Edmond, Okla.




STAGE
AUDITORIUM
BILLIARD ROOM
VESTIBULE
LADIES PARLOR
RECEPTION HALL
MAIN PARLOR
VERANDA
DRIVEWAY
STORAGE ROOM
COAL ROOM
BOILER ROOM
BOWLING ALLEY
BOWLING ALLEY
BOWLING ALLEY
GAME ROOM
HALL
BASEMENT PLAN
MAIN-FLOOR-PLAN
KITCHEN
GALLERY
LANDING
DINING ROOM
READING ROOM
HALL
ROOM
BALCONY
BALCONY
SECOND FLOOR PLAN

PRACTICAL CARPENTRY

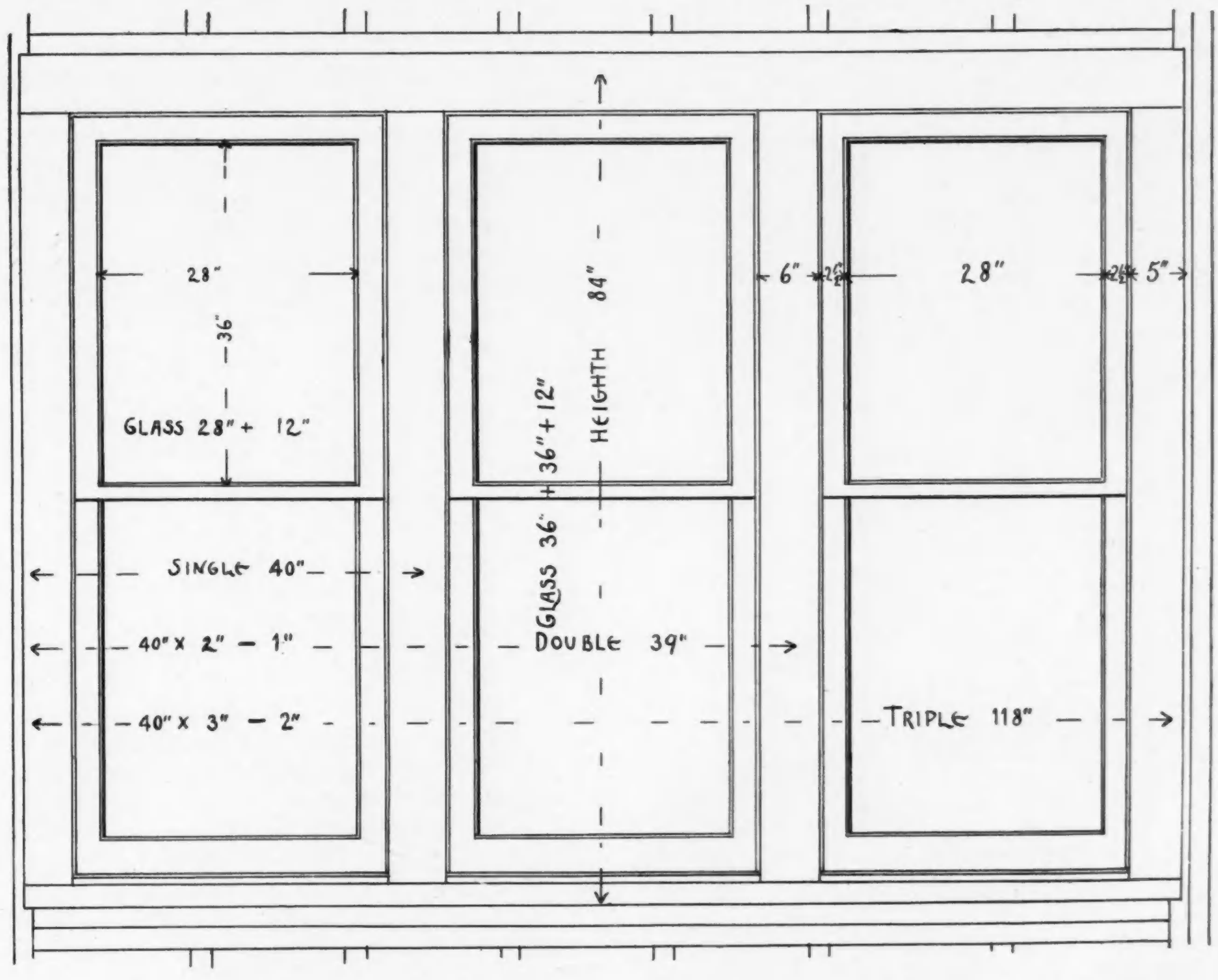
Openings for Doors and Windows

VARIOUS METHODS USED BY EXPERIENCED CARPENTERS WHICH CAUSE LOSS OF TIME—SIMPLEST AND MOST ACCURATE WAY OF CUTTING SAME

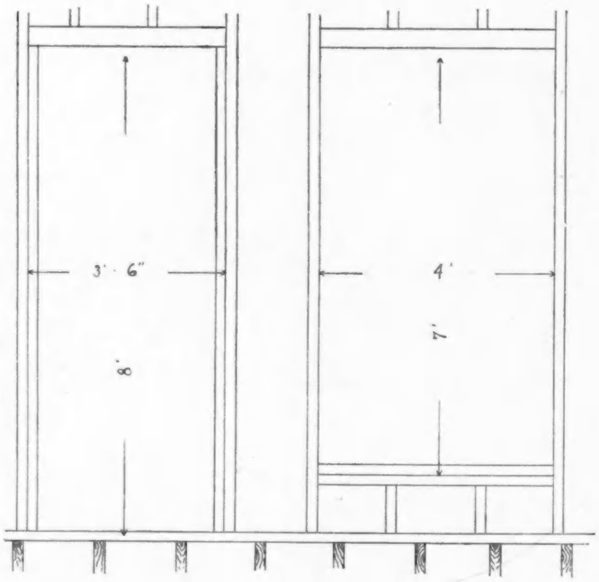
By Dwight L. Stoddard

IT SOMETIMES seems to me that there is not a trade or calling that the boy falls as naturally into as the building trade, especially carpentering. I never saw a boy but what knew something about driving nails, and quite a large per cent have at least tried to use a saw. So it comes naturally, and they easily commence to nail on a few boards, which gives them a taste, and they start in to be a builder. Step by step they move along from rough work to siding, cornice and finally to inside finish, and if they have a desire to go ahead with the work they lay it out for themselves as well as others.

They get hold of some good work on the steel square, and if they are natural mechanics they soon become a good framer. And yet as easy as it is and as natural also to be a good carpenter and a building foreman, it is indeed surprising to know that there is probably not one carpenter in a hundred who can cut out the openings in the framework, and get them so that when the frames come they will fit perfectly.



I have heard good foremen much older than myself, say the only right way was to wait until the frames came and measure them and then cut out the openings. Some sheath a house all up solid, and when the frames come they cut out, which is perhaps a sure way, but it never seemed a very pleasant, easy or cheap way to me. Others set the studding all up, and then before they sheath, cut out for openings,



claiming it is a nice way, as the studding are all evenly spaced all over the building. Some of that theory is good, but I could always cut a studding better when it was lying down level on a pair of trestles than standing plumb nailed in a building.

I always found a much better way to lay the openings out and frame them complete before they are raised.

For a common 2 feet 8 inches by 8 feet door, get the exact height the bottom of the door should be from top of joist, then measure up 8 feet, which will give the top of door, then allow two or three inches for head jamb, and space above the door. Always allow plenty of room; don't get the header so low that the lugs will have to be all cut off the jambs.

Now, as the majority of windows are the same height as doors, this measurement when once gotten right is good for many openings. Two inches on each side of door is generally enough, or four inches more than door measurement is the measurement between studding, but as it is well to cut the double studding in under the header, the outside or main studding should be set about eight inches wider than door.

My illustration shows it perhaps plainer than words and also shows an opening, ready for a two-light 36 by 36-inch window.

A very good general rule, one easy to remember and one which works nicely on ordinary 5-inch casings, is to set the studding and headers just one foot more than glass measurement. For a house where the siding is put on the studding, in order to give room to nail and not split the ends of siding, it is well to make the opening a half, or an inch, wider.

The double and triple window are the ones that seem to give the most bother. And yet it is very simple. A double window (with a seven-inch mullion) is just double what a single one is. But perhaps the most common is as illustrated, a six-inch mullion on the outside, which makes them all alike, if you wish, on the inside.

I hope that a careful study of these illustrations will make it plainer to many carpenters when they go to lay out their next openings.

World's Most Ancient Building

The most ancient building in all the world, if ruins may justly be dignified by that name, is located at Knossos, in Crete. This is a palace discovered by Mr. Evans, who for some time has been conducting searching investigations among the antiquities of Crete. Great care is necessary to prevent the building from falling to pieces, as the earth which for untold centuries has covered it, is removed, and this necessity has greatly retarded the work of the searching party, which at present comprises 100 workmen.

One who visits this remarkable building for the first time is greatly impressed by the care taken throughout by the explorer to preserve by skillful repair and reconstruction all the features which give this magnificent building its unique character. The throne room, of which so much has been said and written, is now roofed in and protected. The two "mycenaean" columns, swelling from a narrow base, have been restored from the existing fragments and from indications of similar columns which occur in the frescoes. This is the most complete attempt at restoration, but elsewhere walls have been strengthened at all important points and staircases built to facilitate access from one level to another, so that the meaning of the several portions of this most complicated series of courts and chambers might be made as clear as possible.

Mr. Evans is making great efforts to prepare the palace for the inspection of the approaching archaeological congress at Athens, which will visit the site. This ancient structure is attracting the critical attention of the world's architects, who are greatly surprised at the architectural knowledge and ability shown in far-off ages. It seems probable that this remarkable building, and others that are supposed to have existed in connection with it, will ultimately be restored to something closely approaching their original condition.

A Satisfied Advertiser

"We have received more replies from our June ad. than from ten of our best mediums combined."

Constructing an Ordinary Stair

SIMPLE KNOWLEDGE OF GEOMETRY AN AID IN DETERMINING SHAPE OF A CURVED HAND-RAIL—VARIOUS STEPS TO BE TAKEN IN MAKING THE SAME

By Lewis R. Steinberg

IN determining the shape of a curved hand-rail on a stair, numerous operations of geometry are made use of, and although the knowledge of geometry is not necessary, yet the work of getting out a curved hand-railing will seem much more simple to one who understands at least the fundamental principles of geometry.

The readers of the AMERICAN CARPENTER AND BUILDER will have noticed the series of articles under the heading "The Making of a Practical Carpenter." A careful study of these papers should give a good working knowledge of the subject and that is all that is necessary for a practical man.

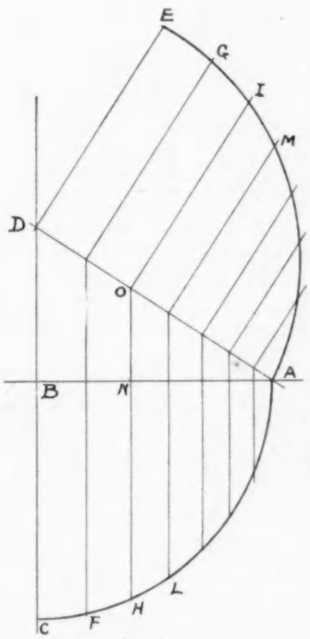


FIG 1.

In working out a piece of hand-rail all the work is done from the center-line of the rail. That is the center-line is projected to the face of the block from which the rail is to be made, and all the bevels are laid off from this face.

We will take up first a simple problem which will show the general procedure for this kind of work. Supposing that we have a right angle turn for which we want the rail. See Fig. 1. First draw the plan AC. This is the line which a vertical plane, passing through the center-line of the rail, makes on the floor. Now on AB at B erect BD the rise of the rail from A to C. Then lay off the distance BC on DE perpendicular to AD at D. E is the point in the rail directly over C at the distance BD above it. Any number of points in the rail may be found in the same way. G being a point in the rail over F, I, one over H, etc. The height of any particular point is the distance on the perpendicular to AB between its intersections with AB and AD. As for instance NO is the height of I above the point H on the floor.

The bevel for the lower end is the angle ADB. At the upper end the section of the rail is square with the block.

To shape the block, a mould or template, a little wider than the rail and to the curve of the rail, is made of thin stuff. Upon this are marked the tangents and the center-line of the rail. The template can then be placed upon the block in the proper position and the edges trued up ready for the moulding.

The ends of the rail are cut square with the face of the block and with the tangents of the center-line. Where the ends meet the straight rail or the next section of the curved rail, dowels are used to make a solid joint. Sometimes the only fastening used is on the underside of the rail, but the joint will be much stronger if dowels are used besides the fastening on the underside of the rail.

Largest Railway Station

It has been popularly supposed that upon its completion the station of the Pennsylvania railroad in New York city will be the largest structure of its kind, far surpassing, as it will, the depot at Liverpool, England, which now holds the record. It appears, however, that Leipsic, Saxony, is to have one that will surpass the structure, the foundations of which are now being laid in New York.

The Leipsic station, which will be ten years building, will have thirteen train platforms, each more than 1,000 feet long, and will accommodate trains from twenty-six different lines. It will be spanned by seven immense arches, each 140 feet wide. In its construction granite, marble, steel and bronze will be freely used, fine architecture and beauty being ends aimed at, as well as the most perfect utility. The huge structure will be liberally embellished with works of art. This will be especially true of the immense waiting and refreshment rooms, the walls of which will be adorned with huge frescoes of the most famous German landscapes. The entire cost of the building is estimated at $32,500,000.

An Economical Man

"I don't know," confessed the puzzled wife, "whether to have the house repapered to match my old dresses or to buy new dresses to match the paper we now have."

"I fancy," suggested the husband, who was a quick thinker and a lightning calculator, "that we would better repaper the house."

Amateur stair builder—(On nearing the top end of a stair string he was trying to lay out)—"Say, Boss! which will you have here at the top, two small steps or one d—— big one?"

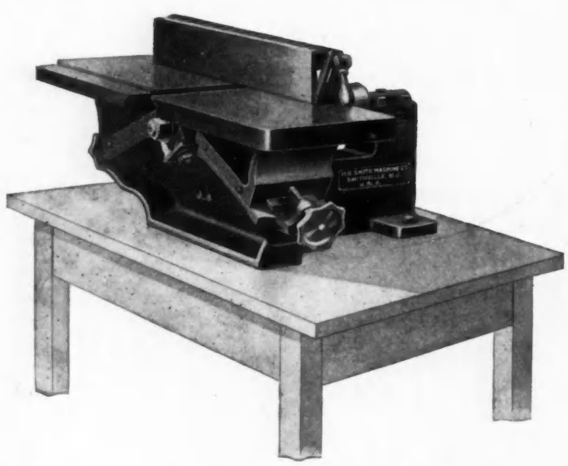
Planing Mill Work.

— J. Crow Taylor. —

Best Machines for a Beginner

TWO MACHINES MOST ESSENTIAL TO THE CARPENTER—VARIOUS THINGS THAT CAN BE ACCOMPLISHED WITH BENCH SAW AND HAND JOINTER—WHEN TO USE A COMBINATION MACHINE

WHEN the progressive carpenter reaches the point of adding a little wood-working machinery to his carpenter shop the first problem that confronts him is what kind of machinery to install and how much. When he starts in to solve this problem by getting in correspondence with manu-



facturers of wood-working machinery he will soon find such a long list of machines staring him in the face that it becomes confusing, and there is danger of him either becoming discouraged over the project or else going in too deeply at the start, and invest in more machinery than he has any business with. As has been pointed out heretofore, when a carpenter goes into machine woodworking he should bear in mind that his best chances for success are in doing special work only, avoiding efforts to manufacture any kind of standard stock that is made in planing mills and sash and door factories, including moulding and every kind of wood work that is made and carried in stock, because, as a rule, he can purchase material of that kind cheaper than he can manufacture it. The local conditions, of course, are quite a factor in the matter, but, as a rule, what the carpenter wants is something that will help do his work, do carpenter work, not regular mill work, and lest he burden himself with a lot of expensive machines and probably become involved financially, should go carefully at first and start in on a small scale. In other words, he should install at first only just what machines are essential to .his immediate needs. One machine he must have to start in with is some kind of a table or bench saw for ripping and cross cutting, and the next machine is a little hand planer known as a jointer. With these two machines the carpenter who is anything of a genius, and most of them are, can do an astonishing variety of work.

With a plain bench saw arbor and a full complement of saws, dado heads, etc., there is a long list of possibilities, and when we go a step higher in machine wood work and begin to look around for a real universal wood worker we find that the closest thing to it is a hand jointer. This fact is so generally recognized among machine wood workers in the larger enterprises that you seldom see a well-equipped wood-working institution but what has one or more of these jointers. Illustrative of the general regard for a jointer on the part of the machine wood workers and suggestive in some measure of the possibilities of this machine, I could probably not do better than quote from a short article that appeared in the Woodworker a few years ago on the subject. "If I were asked," said this writer, "to point out the universal

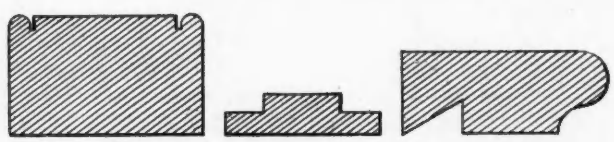


FIG. 1 FIG. 4 FIG. 2

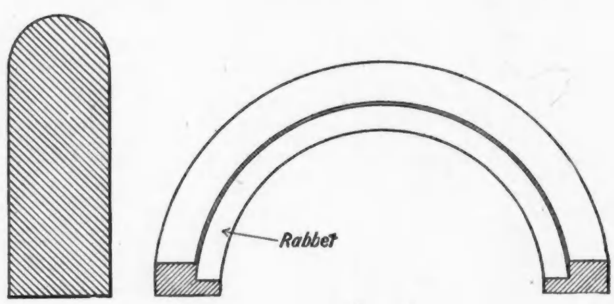


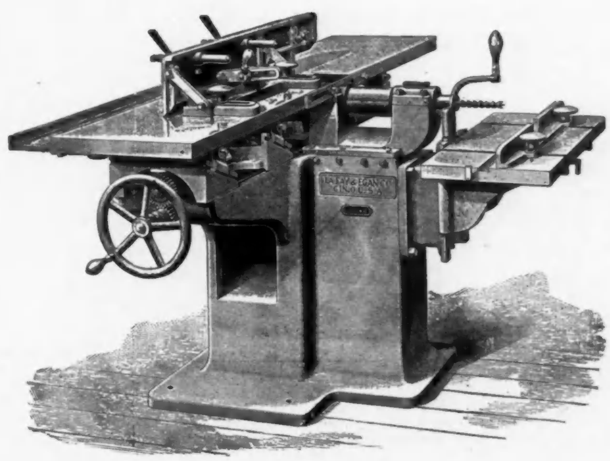
FIG. 3. FIG. 5.

wood-worker, I would point my finger at the jointer. No doubt one not familiar with that machine would express some surprise at a one-head, insignificant-looking machine being called a universal wood-worker, but I think after I had given him a course of instruction as to the different work that may be done on that machine, he would also express surprise at its qualifications. If my questioner were to ask me which two of all the machines on the floor would I prefer, I would say, leave me the rip saw and jointer. With these I believe I could hold my own with the next one. The variety of work the jointer will do is almost endless. Take house trimmings for example. You can get out any ordinary simple design with the two above-mentioned machines, except the corner blocks, and if I had to go up against it I believe I would make a bold attempt at that. The jointer is a much-abused machine, though it gets back at you sometimes. It is everybody's machine, even down to the negro laborer, who sometimes gets it into his head that he can work so simple a machine. I have caught such men trying to "tune her up." Speaking of tuning, I would say that where the jointer is properly adjusted it will put those old-time pianos to thinking. I have heard pianos that would sound like so many tin pans beside the jointer.

"A few days ago I had some casings to work, and all the molders were busy. I gave one of the men the job and told him to do the whole job on the jointer. He looked at me a little sidewise, and went on. It was a beaded casing, one and one-half by two and one-half inches. See Fig. 1. While he was getting the stock ready for the beads I set up the jointer, and in about ten minutes we were well into the pile. He expressed some surprise at working both beads at the same time. He had been used to turning stock end for end, consuming double time. Both beads can be worked at the same time as well as one at a time, if the stock is perfectly straight. The accompanying sketches are self-explanatory. All these designs can be worked on the jointer with hundreds of others."

It will be noted from all this that the special field of this machine is in the making of various articles required in house trimming and that is just in line with what the carpenter wants. The one thing he will have to keep continually resisting at first is the temptation to start in and make everything on this jointer, make things in the shape of mouldings, for example, that he can buy ready-made cheaper than he can do the work. There is, too, another temptation that will come along with the search for the best machine of this class. There is a great string of hand jointers on the market, practically every wood-working machinery house builds hand jointers of various kinds and sizes, from the small simple machine that will not cost much more than a table saw to large, elaborate combination machines that are as expensive as the big flooring machines used in planing mills. And, incidentally, these large machines call for considerably more power, too, if used to their full capacity. In this, as well as in all the rest of the work in equipping a carpenter shop with wood-working machinery, the matter of selection depends somewhat on local conditions. For some shops the very smallest and simplest machines are as good as any, while for others, those isolated from planing mill centers, where there is necessarily a great variety and a heavy volume of machine work to do, had best be equipped with some of the combination machines.

Beginning on the smallest scale first, as is generally a good policy in developing a carpenter shop into a machine wood-working institution, what is probably the smallest and simplest machine in the line of a jointer is one, the cut of which is herewith shown, that is especially designed to meet the wants for a



small, low-priced planer or jointer. The machine is only twenty-nine inches long and is made to bolt on a table or bench and requires very little power to drive, from one to two horsepower being sufficient. When we compare this machine with the larger jointers, which have tables from five to eight feet long, it appears very short, and yet it can be made to do very good work, even at jointing, for it is about as long as the average carpenter's hand jointer, and in doing such work as shaping it is practically as convenient as the longer machines of the plain type. In short, a machine of this kind ought to do good general service in a carpenter shop, and it has decided advantages in the way of size, simplicity and price. There are probably a number of other machines of this same class that can be found among the list of various manufacturers of wood-working machinery, and it is the general class or type referred to rather than the individual machines, as representing approximately the minimum limit in cheapness, simplicity and power required.

For those who desire to go into machinery wood-working on a somewhat extensive and elaborate scale, there is offered a great variety of hand jointers, both simple and in combination machines, which include saws, boring machines, moulder attachment and a great number of other features. In fact, there are some large machines of this class made that seek to combine the essential elements of practically the full list of machines used in an ordinary wood-working factory. And, it is in shops of this kind, shops where special job work is the order of the day, that these combination machines give the best service. In the larger wood-working factories the combination machine is a sort of mixed blessing, because where there is anything like a heavy volume of any one class of work to do, it is money and time saved to use a special machine for this work instead of having a man spend half of his time fitting up the combination machine and then getting what is, compared to special individual machines, only an indifferent makeshift. In other words, the combination machine is frequently quite a time waster in a big wood-working establishment, where, as a rule, the proper thing to do is to have special machines for the different lines of work. But, in smaller wood-working institutions, in the jobbing shop, it is one of the best machines going, and the only question of the advisability of installing such a machine is involved in whether or not there is work enough to justify it. If, however, in order to get work enough to justify the use of a machine of this kind one must make standard mouldings, table legs, door panels and other standard stock as a regular line of business, it is better to let the machine alone and use a cheaper and simpler form of jointer. But where you have the work to warrant its use it is a great machine to have.

Framing a Circular Porch

HOW TO FRAME THE JOISTS FOR FLOORING AND CEILING OF A PORCH, CIRCLING THE CORNER OF A HOUSE

THE accompanying illustration at Fig. 1 shows the method that we have used in our own work for a number of years and is probably as good as any other. The central part of the illustration shows the frame work of the floor joists with a portion of the flooring in position.

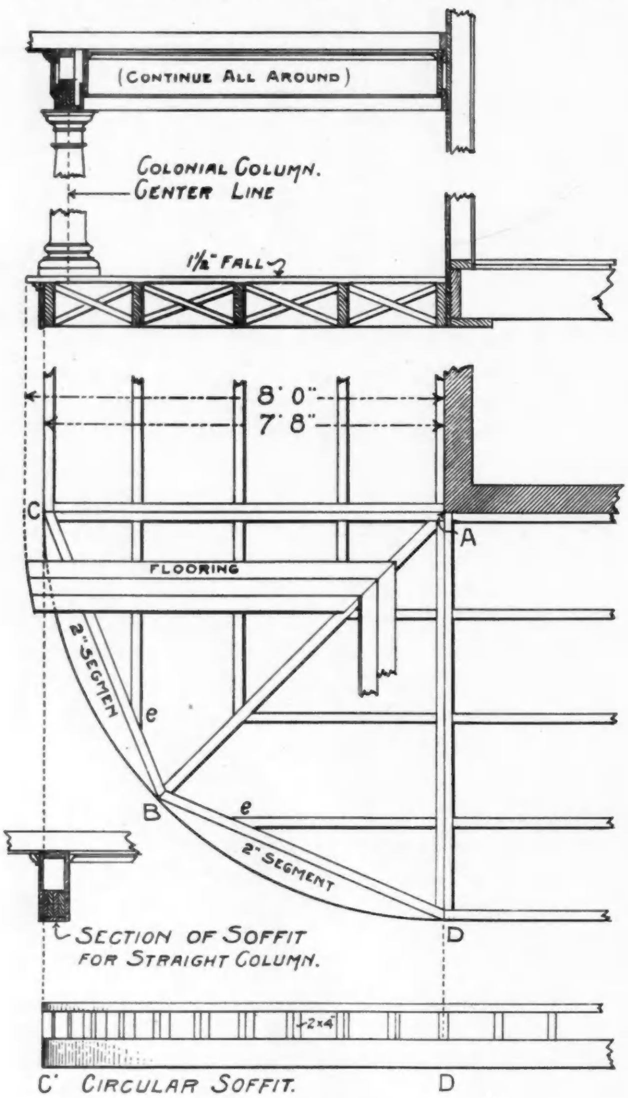


Fig. 1.

There should be supports at C, B and D. From C to D is one-quarter of a circle, and this divided in the center, as at B, then the straight lines C-B and B-D are equal to the sides of an octagon with a circumscribed radius of seven feet and eight inches, which is the width of the framework of the porch and the length of the sides may be found by multiplying the radius by the decimal 9.18, which equals five feet ten and three-eighths inches, and is the length to cut the side pieces and is also the length of the chord of the segment to form the circle to receive the base.

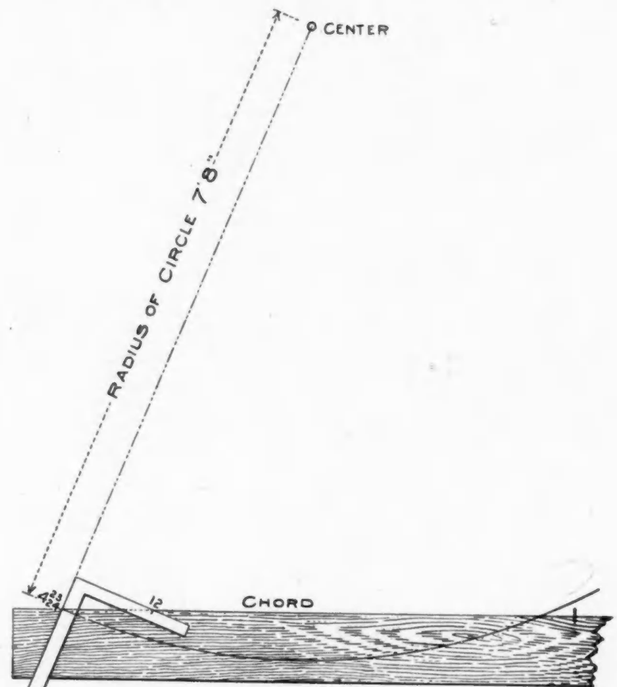


Fig. 2.

In the absence of the above decimal or in case a person is not apt in figures, these parts may be found as shown in Fig. 2. By placing the square on a board, from which the segment is to be cut, with the figures that give the octagon cuts and lay off the radius in line with the blade, as shown, describe the arc, and it is ready to cut. The figures shown on the square will give all of the cuts required in the frame work about the octagon, as the blade will give all of the cuts at B, also at the other end of the side pieces at C and D. The tongue will give the cut at e and e. The other cuts are the square or on the 45 degree angle. Thus, from this it will be seen that all of the pieces can be successfully framed without first building a part of the framework and scribing the other pieces to it as is the general custom.

There should be four of the segment pieces gotten out, setting one flush with the top edge and one at the lower edge of the joists. The upper ones should be of one and three-fourth inch stuff, same as the joists, while seven-eighths will be sufficient for the lower member. Set blocks between these segments, nailing them well to the joists, also set a few blocks flush with the face of the segments, which makes an excellent form to secure the base.

The ceiling joists are usually put on the narrow way of the porch with an angle piece same as at A-B, on which to form the miter joint of the ceiling.

To form the soffit we use seven-eighths by six or eight-inch sized boards and spring them to their proper place just the same as building a circular girder. The first board should be sprung to a form and the next board well nailed to this one, and so on till the soffit is to the required thickness or strength, as it is not always necessary to build to the full width desired as it can easily be furred out to the required width. The soffit should be continuous; that is, for the straight part as well as for the circle. Long boards should be used so as to lap well around the circular part, being careful not to break joints on the circular part or at C or D.

A soffit if properly built in this way will not necessarily need a column set at B, as it will be self-supporting. If straight columns are used the outer face of the framework should be flush with the framework below, but if tapered or colonial columns are to be used, then the center of the soffit should rest over the center of the column, as shown in the upper part of the illustration of Fig. 1.

In case a deep frieze is wanted, it may be had by building on top of the soffit girder with blocks, and putting a formed plate on these. For all circular mouldings, it is better to have them solid, and they will then always stay in place, as there will be no kerf joints to open up after the work is completed.

A Modern School House

SHOWING THE PLANS OF A WELL EQUIPPED BUILDING—CHILDREN ABLE TO DO GOOD WORK UNDER THE EXISTING IDEAL CONDITIONS

THE accompanying illustration shows the large eight-room school located at Hawthorne, Ill. It is constructed of dark red, paving brick with stone foundation. The building is constructed along the most modern ideas with reference to heating, lighting, plumbing and ventilation.

The basement is well equipped with boys' and girls' play-rooms, furnace and fuel rooms, and the toilet rooms have the most recent sanitary equipment.

The first floor has four rooms twenty-five by thirty-two feet and the seats are so arranged that children get the light from the rear and left side. The blackboards are of slate, which is considered most durable. Every room has a place where reference books can be kept for the convenience of the pupils.

The second floor has a similar arrangement with the exception of a teacher's room, which is at the head of the front stairs. This can be used as the principal's private office or by all of the teachers. The halls are large and afford easy access to the outside as a front and rear entrance lead from them. This is a good feature as it prevents crowding, the small children going out of one entrance while the larger ones use the other.

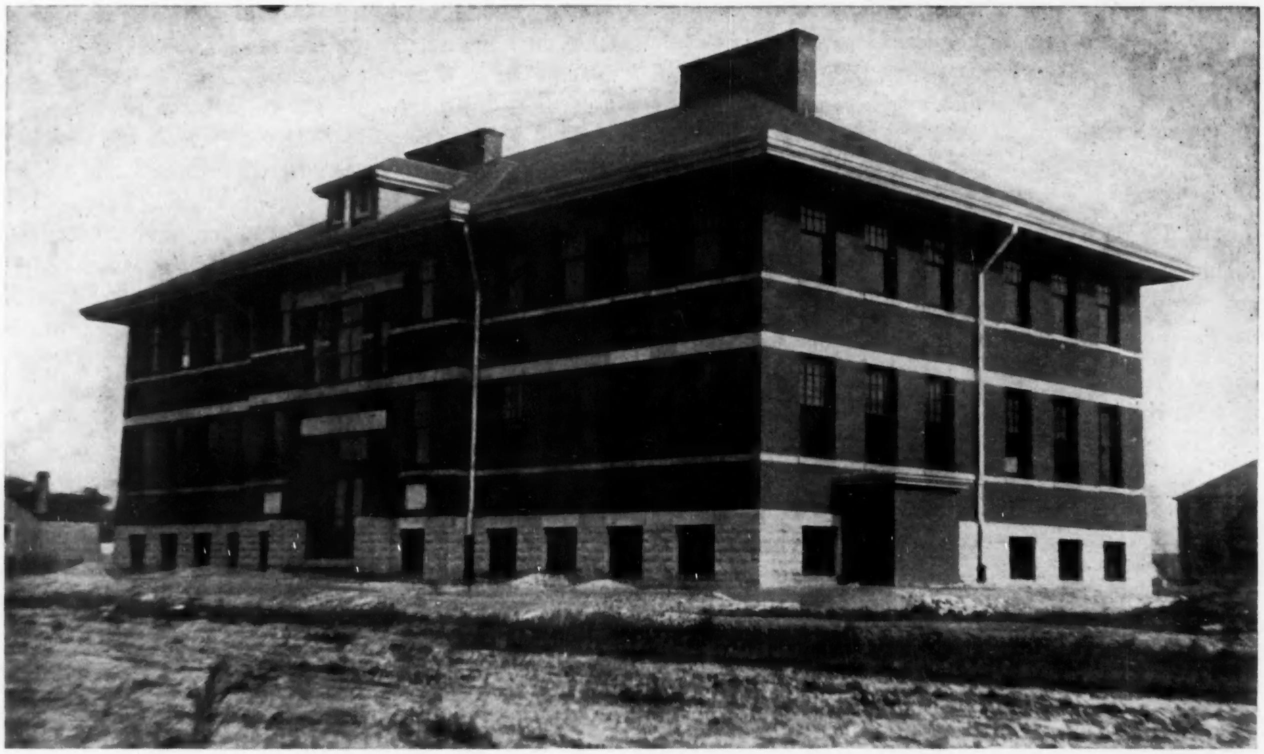
Largest Building in the World

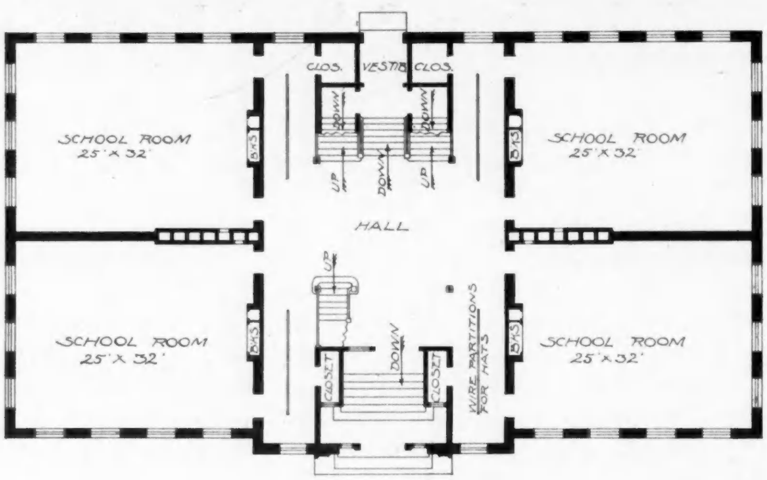
The largest building in the world is located in the "Forbidden Land." It is the palace of the Great Lama, in Shosa, the capital of Tibet. This palace, which is perhaps better described by the word castle, is 900 feet long and 437 feet in height. Its great size is not its sole attraction, since it is one of the most imposing structures ever reared by man. It contains some 3,000 different apartments, many of them being of enormous size. With the exception of a central portion devoted to the uses of the Grand Lama, the exterior is painted white. The roof is said to be made of solid gold. This statement may be discounted, though it is undoubtedly coated with that expensive material, presenting a dazzling effulgence under the rays of the sun. The interior of the enormous structure, with the exception of the private apartments of the Grand Lama, are in no respect noteworthy.

New Puttying Tool

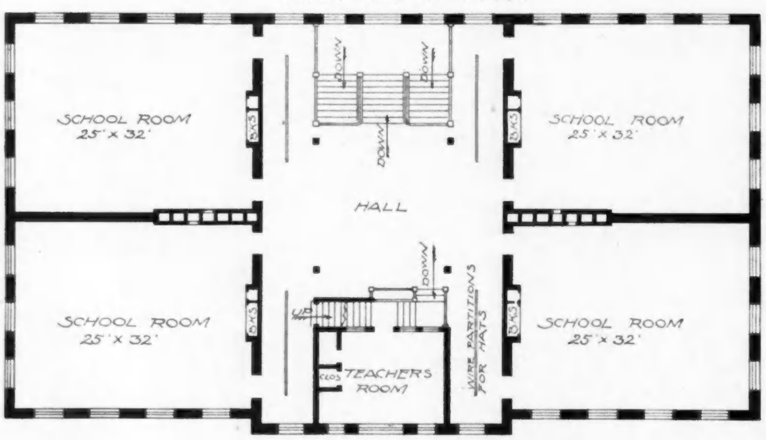
The latest manner of performing the familiar puttying operation is by the use of a wheel instead of the knife. With it the work can be done more easily and quicker. The device consists merely of a handle of cylindrical shape supporting the roller. A lump of putty being placed at the desired point, the tool is placed back of it and moved along the edge of the frame, with one end of the roller resting on the ledge of wood of the sash surrounding the pane.

The result is a quick and smooth deposit of putty. This is not always readily obtained with the use of the putty knife, for if the putty is not just the right consistency it has a tendency to crumble under the knife edge as it passes along.





FIRST FLOOR PLAN



SECOND FLOOR PLAN

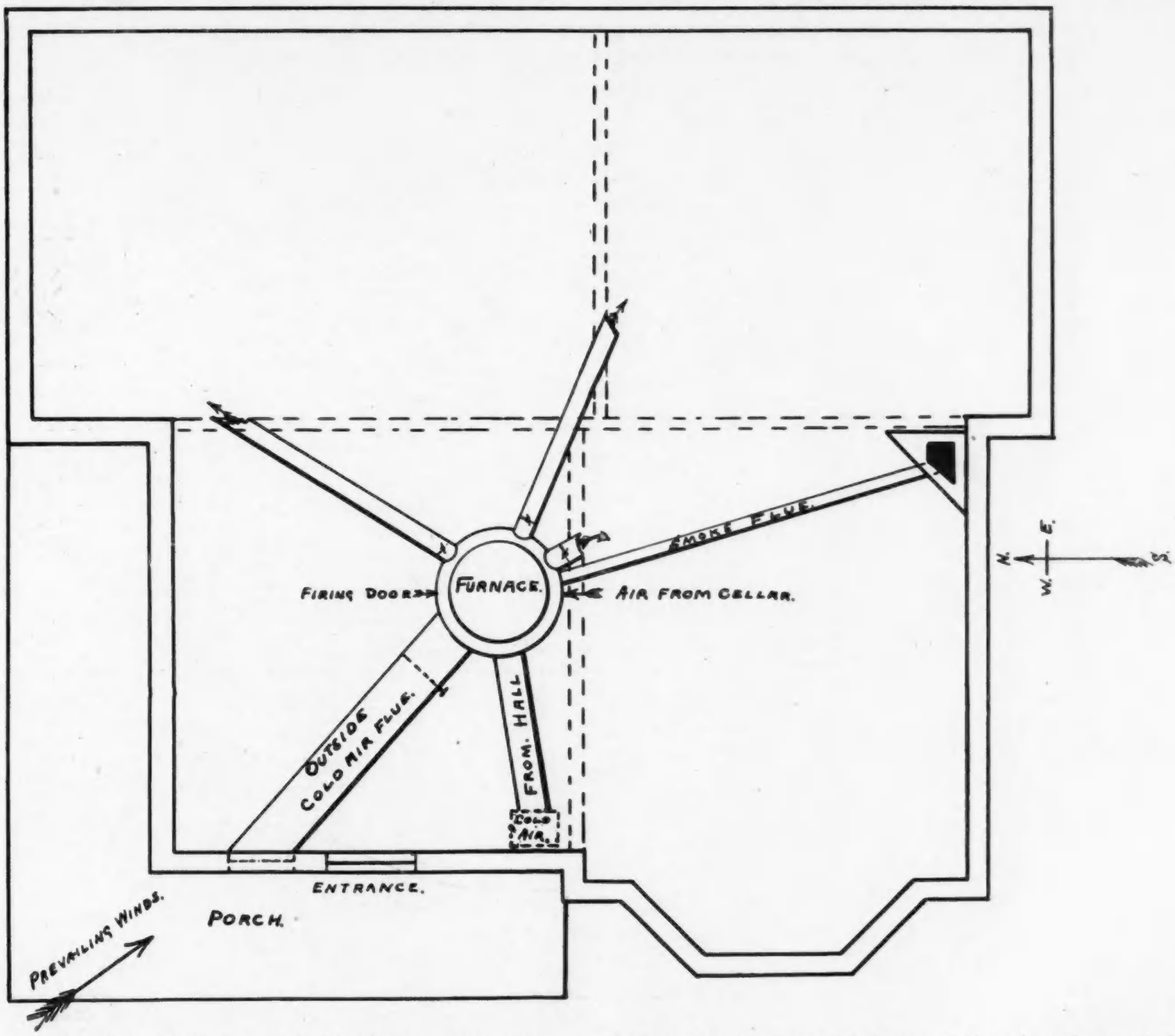
HEATING

Wm H. PEARCE. M. E.

Heating a Home

RULES TO FOLLOW IN ORDER TO HAVE AN EVEN DISTRIBUTION OF HEAT THROUGHOUT THE HOUSE—DIAGRAM SHOWING ARRANGEMENT OF HOT-AIR PIPES

THE story is told of a good woman whose boy having been apprenticed as a sailor to serve as cabin boy inquired anxiously of the captain if her boy would get enough to eat, to which the captain gave her full assurance. "But," said the good woman, "can he see it?" "Certainly," replied the captain. "Well, that satisfies me, for if he can see it I know he will get it."



This story serves to illustrate the satisfaction there is in using a stove for heating purposes. You know you have a fire when you are able "to see it," which is a matter of much satisfaction, especially to old people, their early associations being such that they do not feel entirely warm unless they are in close companionship with a stove.

The home builder of small means must choose for himself which method he will use. If he choose a hot-air furnace he will gain the space that would otherwise be occupied by stoves and as to first cost the furnace is liable to have some advantage. The stove, however, is understood, but the application of a furnace may be a failure. It requires a great deal of discussion. Even then mistakes are made, which these simple explanations may probably guard against:

First: Let us consider a furnace as a stove. In fact, it is nothing more, except that instead of its heat being radiated directly into the room it is given off into the air space surrounding the furnace, which is placed in the cellar. From this air space the hot air pipes lead to the various rooms; therefore, the hot air must rise and force itself against any pressure or draft there may be in the rooms above, which is a considerable item, especially when the wind is blowing at 40 miles an hour, percolating through the windows and doors and creating a pressure in opposition to that of the hot air, this being one of the principal reasons for failure in the use of hot air furnaces. The writer has prepared a diagram of a cellar and location of a furnace taken from one of the house illustrations in the last issue of this paper, from which it will be seen that the furnace is located in such a position that the pressure of the prevailing winds is taken advantage of, a cold air flue being located so as to receive the benefit of this pressure. The air from it is heated by passing over the surface of the stove or furnace, and it then has an added velocity and pressure which will force the hot air into any part of the dwelling.

It will also be noted that the hot air pipes leading from the furnace are as straight as possible leading in the direction of the various rooms. The question may be asked, "Will this heat the room above the entrance or hall?" The answer is, "Certainly, because the pressure of hot air is greater than that which will percolate through the windows of that room." Of course, the tendency is for the hot air to pass in the direction of the winds. If the dampers in these pipes be partially closed the heat may be distributed evenly to any part of the dwelling.

Second: See that all pipes are as straight as possible, as every crook or elbow detracts from the air pressure.

Third: See that you have a liberal-sized chimney, which projects above the peak of the roof so that the winds will not curl over the roof and blow down the chimney, thereby spoiling the draft.

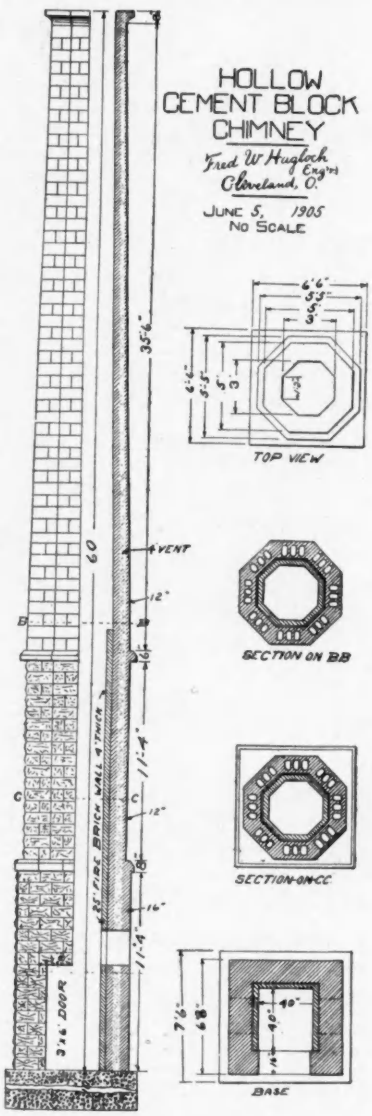
Fourth: Select a manufacturer whom you believe is manufacturing furnaces on honor. Send him the plan of your house and ask him for the size and price.

Fifth: Buy what he recommends and follow the above general rules, and you will have a good heater.

I am very proud of the American Carpenter and Builder.—L. L. Payne, Kleburg, Texas.

Hollow Cement Block Chimney

This chimney or stack now being erected at Cleveland, Ohio, at a cost of $170, including foundation, differs from the usual brick chimney in that air drafts or vents with inlets from the outside at the bottom are carefully constructed so as to keep the chimney cool and thereby prevent expansion, which it is hoped will prevent cracks and breaks so common in like structure made of brick.



This chimney is built with walls sixteen inches thick the first twelve feet, and twelve-inch wall the second twelve feet, at which point the thickness of the wall diminished to eight inches at the top.

The material used is as follows: Concrete blocks, made of one part Portland (Pennsylvania brand 1,200 degrees fire test) cement, three parts lake sand and two parts crushed basic slag.

The mortar used in laying the blocks and plastering the interior consists of one part Struthers furnace slag (2,400 degrees fire test) cement, two parts lake sand and three parts fine crushed basic slag. It is expected that the iron in the basic slag will rust in time and badly discolor, but its great fire test fully overbalances the above objection. The interior of the chimney will be lined with a four-inch wall of Eureka fire brick to a height of twenty-five feet.

Didn't Use Profanity

"Shay," began the inebriated caller, "want a good carpenter here?"

"No," snapped the busy builder. "Get out!"

"Well, shay, d'ye know any uzzher place yer could tell me ter go to?"

"Yes, but I'm too polite."—Philadelphia Press.

Plumbing

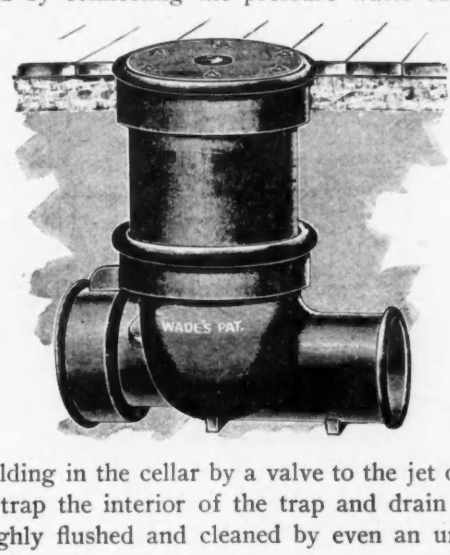
WM. R. MARSHALL.

Important Accessories to a Perfect Sewer System

GIVING THE LATEST AND BEST VALVES AND JOINTS TO USE TO PREVENT ANY LEAKAGE—VARIOUS REASONS FOR USING SAME

TIDE water traps, or more commonly known as backwater gate valves, are used on house drain systems, where street sewers are so small that excessive rain storms flood the system, and back up into the house drain pipe. Fig. 1 (in the figure, the wall is broken away to show the interior of the trap) the body of the valve is iron, and the gate valve is made of fine brass, with planed face to make it water and gas-tight; the doors of the valve are hung with heavy brass

hinges, and in action, are automatic, by means of which the flow of sewer, water, gas and refuse from the public sewer is prevented from backing up into the house drains. The cover on the inspection clean-out is fastened down to a gasket with heavy bolts countersunk so as to be flush with top, and are easily removed for inspection, flushing and rodding purposes. This particular back water gate has a water flushing jet, and by connecting the pressure water supply of



the building in the cellar by a valve to the jet opening in the trap the interior of the trap and drain can be thoroughly flushed and cleaned by even an unskilled person.

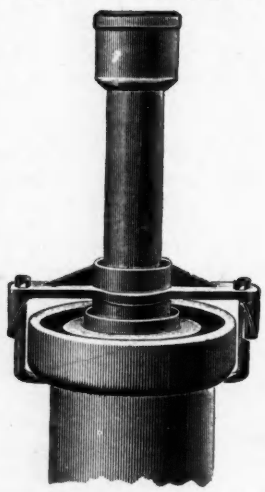
In Fig. 2, we show the same trap with an iron extension man-hole, which extends from the drain in the ground to the surface of the cellar floor, and is provided with a water and gas-tight metal cover bolted to a gasket, which can be easily removed, and which prevents disturbing floors and concrete, when there is any necessity of inspecting the interior. A combination house drain trap and back water trap with vent opening and inspection opening or a cleanout opening, is shown in Fig. 3. A trap of this type, or, in fact, any trap should be set perfectly level with regard to their respective water seals. If the inlet to the trap is tipped up, it will not retain enough water to form a water seal, and if the outlet is tipped up, too much water will be retained, and will back up into the drain pipe. These traps should be placed back of the house drain sewer trap and before the vent opening fitting. These gates should never be used in lieu of a drainage trap, but in connection with same. In case of a fixture being located in the basement, a gate valve, Fig. 4,

should be placed in that branch pipe of the house drain, so that it can be shut off from the main drain to prevent flooding of the basement during the flooding periods, when the back water gate valve is closed, as then the fixtures above the street level can be used, which could not be done if it was omitted, as the sewerage of the fixtures above the street level would back up through this branch pipe and overflow the basement at the fixture.

VITRIFIED SEWER PIPE CONNECTIONS

Where vitrified sewer pipe is used under a house for a house drain, the connections between the cast iron risers and vitrified pipe is generally made by placing an ell on the end of the vitrified pipe and running the cast iron pipe into it, and cementing the opening pipe with Portland cement. There are a great many objections to a joint of this kind—one of the most serious being that owing to the settling of the building or of the sewer, the joint becomes broken, thereby permitting an opening for the escape of sewer gas, even if same is not large enough to permit a leakage of the sewer at this point.

A better joint can be had by using a recently patented device for making a connection between iron and vitrified sewer pipe, as shown in Fig. 5. It is constructed with two lugs, which fasten under the hub of the sewer pipe, and when the lugs are drawn tight by the two nuts on the top, it presses the cast iron collar shown on the inside of the hub against a flax collar or washer, which fits the inside of the sewer pipe hub. This makes a tight connection on the inside of the hub, and the connection around the iron pipe is made in the same way, as the top ring also has a flax ring which goes around the iron pipe, and the two flax washers are compressed at the same time, making a joint which is perfectly tight, and which can be thoroughly tested by filling the hub of the sewer pipe and upper collar with water.



This fitting acts as a slip-joint in case of a settling. It is not complicated, and is almost instantly adjusted. This connection is also made in two pieces, and can be used where it is impossible to take out a length of pipe without damage to the old sewer already in place.

Reinforced Concrete Warehouse

A brick and reinforced concrete warehouse has been recently built at Toronto at a figure that did not vary much from that of a slow-burning mill construction. In plan the structure is 192 feet by 42 feet, with stories 10 feet, 15 feet, 14 feet 6 inches and 13 feet 6 inches high from the basement up. The columns are on 16 my 12-foot centers, while the floors are designed to carry 300 pounds per square foot. The columns are provided with a wrapping of expanded metal, like the hoops employed in some other systems of construction, and are reinforced by steel rods at the corners. They are connected by concrete girders. These girders are reinforced on their bottom surface with six rods, some of which are bent upwards at the ends. The girders have sheets of expanded metal at their ends.

I am well pleased with your book. I think it a very practical work and something that is indispensable to all carpenters. It should be in the hands of every mechanic in this line throughout the country.—D. C. Mansell, St. Joseph, Mo.

Only a Question of Time

It was a house with a balloon frame, standing on cedar posts. A fierce tempest from the north had struck it just after the roof had been put on and the weather boarding finished, and had pushed it five feet out of perpendicular.

The owner was sitting on the front step, calmly smoking his pipe, when the traveler happened along.

"Had a stroke of bad luck, haven't you?" said the traveler.

"Yep." (Puff.)

"Building would have stood it all right if it had been finished, wouldn't it?"

"I reckon so." (Puff, puff.)

"Going to tear it down and build it over again?"

"Nope." (Puff.)

"May I ask what you intend to do with it?"

"Nothin'," answered the owner, removing his pipe from his mouth. "Goin' to wait for a hurricane to come from the other direction and straighten it up agin."—Chicago Tribune.

Markings on the Saw

An invention pertaining to compound tools of the saw type has for its object a design as simple and efficient as the ordinary saw and almost, if not quite, as cheap, provides means by which the various angular cuts resorted to in carpentry may be expeditiously and easily found and marked. The blade is similar in type to the ordinary hand-saw, except that it must have a straight back and carries a number of inscribed lines to mark different angles, such as 15 degrees, 22½ degrees, 30 degrees, 45 degrees, 60 degrees, etc. Other correlated information, such as the amount of rise per foot of run of horizontal measurement for any of the angles within the scope of the saw is added. These marks considerably increase the sphere of the tool and render it unnecessary to employ the usual miter when an angle cut is to be found and marked, without in any way rendering the tool cumbersome or interfering with its ordinary use. Moreover the improvement does not add appreciably to its cost.

Sawing Brass

Almost all hack saws or jib saws will cut soft brass very well. The teeth must be very fine and some judgment employed in their use. The jig saws are extremely light, not larger than a small wire, and must be used in a spring frame that will hold them tight so that they will not double up. Jewelers' saws will be needed for spring brass.

Rounder—"How fast they build houses now days. Last week that house was begun and now they are putting in the lights."

Walker—"Yes, and next week they are going to put in the liver."

PAINTING

EDWARD HURST BROWN

Painting the New House

IV. BEST METHOD OF PRESERVING STRUCTURAL METAL—SOLUTION TO USE IN COLORING COPPER—PRACTICAL WAY TO STAIN SHINGLES

STEEL is coming into such general use for the structural skeleton of modern buildings that it has become very essential that its durability should be guaranteed by means of some protective or preservative coating. It must be understood that it is much more difficult to protect structural steel from rust than it is to protect wrought iron. Instances are not uncommon of wrought iron railings and ornamental metal work that have stood for years without paint, and yet have not rusted—or have practically remained free from corrosion. Many such examples are to be found in the English and Continental cathedrals and other buildings which have survived from the middle ages. Yet the modern bessemer and open hearth steel will soon rust unless adequate steps are taken for its immediate preservation. One thing that makes this very difficult is the fact that the process of rolling steel plates and beams produces a sort of scale on the surface which must be removed before any protective coating is applied. Otherwise the moisture will get in behind the scale and the rust will gradually eat its way into the steel, seriously menacing its strength. Wire brushes and chisels or the sand blast form the most effective means of getting rid of this scale, and this should be done at the rolling mill ,as soon as practicable after the metal has come from the rolls. It should then be coated with some protective coating that will preserve it from air and moisture until it has reached the building where it is to be erected, but on no account should it be painted with one of the cheap metallic paints so often used by iron manufacturers and so generally containing sulphur, or else mixed with petroleum oil of some kind.

Opinions vary very greatly as to what is the best protective coating for structural steel. Large prizes have been offered for the best essays on the subject and engineering societies have considered it at great length.

It is generally conceded that linseed oil alone is not an adequate protection against rust, since dried linseed oil is not impervious to water or to gases. This throws out many paints composed of a mixture of an inert pigment with linseed oil, although there is no doubt that the presence of the pigment adds considerably to the waterproofing properties of the oil. The writer has seen tie rods taken from overhead railroad bridges, that were exposed to frequent blasts from the smokestacks of locomotives directly beneath these steel rods, in which the metal was honeycombed with rust although the paint on the surface was apparently intact. Hence the appearance of the paint is no guarantee that the metal is being protected from rust.

Two entirely distinct classes of protective coatings for iron have been recommended and each class has its supporters, not only among the manufacturers but among the engineers and others who are observing closely the efficiency of such coatings. In this connection it may be mentioned that the Master Car and Locomotive Painters' Association have conducted several series of such tests, especially in connection with the painting of steel cars and the American Society for Testing Materials is now engaged in similar tests which may be expected to show more clearly the character of coating best adapted for the preservation of structural steel and iron. The Society of Chemical Industry has also devoted considerable attention to this subject and the matter has come before nearly all the engineering societies. The first class of coatings consists of those in which the pigment is mixed with linseed oil, either boiled or raw. The second class of protective coatings are more of the nature of varnishes or air drying enamels, and may or may not contain a pigment.

In the first class of coatings there are three groups: First, those in which the pigment is red lead or some mixture of red lead and another pigment; second, those in which the pigment is an oxide of iron; and third, the so-called carbon paints, including graphite.

Red lead, the red oxide of lead, is chemically very active, uniting with linseed oil to form a red lead soap that is insoluble in water and of a cement-like nature. So readily does this union take place that it is practically impossible to keep red lead ground in oil for any length of time without its becoming hard in the package. Hence in using red lead, it must be purchased dry and ground in a portable paint mill as it is to be used—only just so much as will be needed for a day's work—or the dry red lead, if sufficiently finely ground, can be stirred up with the oil by hand as it is needed. This fact that it must be mixed as required, and also that, because of the great weight of the pigment it is apt to sag, or to run down in drops from a vertical surface before it dries, are the chief objections to the use of red lead. Its advantages are that it clings closely to the surface of the iron or steel, that it is practically impenetrable to moisture and that it is very durable. A series of experiments made by coating iron plates of equal weight and size, with red lead and with other pigments and exposing them for several months to the action of sea water, which is peculiarly destructive to paint of all kinds, showed that the plates coated with red lead were free from rust, while those coated with other pigments all showed rust in greater or less proportions. In most paints the oil perishes first, leaving the pigment free to be worn away by rain or to be blown away in the form of dust or to scale from the surface, but the drying of red lead is entirely different from that of most paints. Provided an excess of oil is not used, all the oil unites with the red lead to form an entirely new substance, which is neither red lead nor linseed oil but a linoleate of lead that partakes much more of the nature of a cement than of that of a paint and is almost as indestructible as cement. The method of mixing recommended by one of the largest manufacturers of red lead is to mix it first in the form of a mortar, just thick enough to avoid immediate setting; to allow this to stand for a day to effect complete union of the solid and liquid, then to thin down to the consistency needed for spreading and to apply at once. Others, however, recommend that it should be spread as soon as it is mixed. Raw linseed oil with no drier is recommended by Louis Matern, who has studied very carefully the action of red lead.

To insure covering every part of the iron, at least two coats of red lead should be applied, since there is a danger that the sagging of the pigment would leave parts of the metal uncovered if only one coat were used. In order to make sure that a second coat has been applied to every portion of the surface, it is customary to add a small percentage of lampblack, thus darkening the second coat enough to show any patches of red that might show through, or any portions of the work which the mechanics might intentionally slight. The city of Philadelphia provides that the first coat shall be made from twenty-two pounds red lead, mixed with two quarts of raw linseed oil, which shall be allowed to stand for a short time and then thinned for use with one quart of raw linseed oil and half a pint of japan to make one gallon of paint. For the second coat, twenty pounds of red lead, six ounces of lampblack and two quarts of raw linseed oil are used, which is thinned in the same way with one quart of raw linseed oil and half-pint of japan. The object of the japan, or drier, is to prevent sagging. The Pennsylvania railroad formula is one hundred pounds red lead; four gallons raw linseed oil (boiled in winter); one gallon of turpentine and one quart of japan. The use of turpentine is very strongly criticized by many authorities. The Baltimore and Ohio railroad specifications provide for twelve pounds of red lead and ten ounces lampblack mixed with raw linseed oil to make one gallon of paint. This might be criticized, however, as being too thin to obtain the best effect, as some of the oil will remain uncombined with the red lead, and after its destruction will leave interstices in the paint through which moisture will penetrate. Just enough raw linseed oil to chemically combine with the red lead and no more, would make an ideal preservative coating—its only fault being that it is difficult of application and apt to sag. It is better to err in getting the paint too thick rather than too thin, and if proportions are to be specified, thirty pounds of red lead to one gallon of raw linseed oil is conservative. On top of two coats of red lead, any white lead or other oil paint may be used to give such color effect as may be desired, but on no account should a white lead paint be applied directly to the surface of iron or steel, since white lead being a hydrate-carbonate contains combined moisture which will rust the metal instead of preserving it from rust. Moreover white lead is not a stable chemical compound and it will exert a destructive effect on the metal because of this fact.

Oxide of iron paint is strongly recommended by many engineers as an iron preservative. Others object to it on the ground that as rust is oxide of iron, you are simply applying rust to the iron and that instead of preserving the metal it will promote rust. But iron rust is not a simple oxide of iron. It is a hydrated oxide, or one which contains combined water, and such an iron oxide is never used to make paint for coating ironwork by any manufacturer who has made a careful study of the requirements of a metal preservative paint. An iron oxide paint suitable for use upon metal is made by roasting certain varieties of iron ore, forming an iron oxide that is free from water and which will not change by exposure to the air or moisture. Such a paint will afford a protection to the iron just as long as the oil lasts and no longer. Of course no oxide of iron paint containing sulphur should be permitted on iron work under any circumstances. To be of value, the oxide must be carefully selected, thoroughly roasted and finely ground and mixed with pure linseed oil. Under these conditions, the red and brown oxide of iron paints are probably the best for all around weather exposure. Much of the disrepute into which oxide paints have fallen has been due to the fact that cheap and worthless oxides have been used and they have been adulterated with cheap and worthless oils. Indeed many common iron ores which are of no real value as pigments are exploited as natural paints and are ground just as they are mined, with no roasting or treatment whatever. In fact, three-fourths of the much-talked-of beds of mineral paint that are discovered in every section of the country and which have more or less local sale, have no real paint value whatever. But a carefully selected iron oxide paint is superior to red lead wherever there are either sulphur or carbonic acid gas present, and so far as general experience goes, of equal value under all ordinary conditions.

Carbon paints, including lampblack, graphite and some of the gas blacks, are recommended by some engineers and chemists, and under some circumstances they are even superior to iron oxide paints. Being lighter in weight they cover about double the surface of the oxide paints, but spread out in such a thin film that they are less able to resist wear and tear. Graphite seems to give best results when used in connection with other pigments, such for example as the well-known silica-graphite paint, which is a combination of finely ground silica and flake graphite. When used alone, although graphite resists chemical change, it is too light to resist the wear and tear of use.

As has already been mentioned, there is another class of protective coatings, consisting of air-drying varnishes or japans, including not only varnishes made from fossil resins but asphaltum, either alone or ground with various oxides or carbon pigments. For underground work, such as gas and water mains, these coatings have no equal. They are also highly recommended for gas and water tanks, and, except asphaltum, for the concealed structural ironwork of buildings. Quite a number of protective coatings of this class are now on the market, some of undoubted excellence, while others are of inferior quality. It is not within the province of these articles to choose between the goods of different manufacturers, but it is sufficient to say that if a coating of this kind is wanted that is to be of any real value, the purchaser must be willing to pay a good price for it, equal indeed to that asked for a first-class finishing varnish, for the same grade of gums must be used in its manufacture, except that selection for color is not necessary. The greatest advantage which these coatings possess is that they are practically impermeable to moisture and corrosive gases, and when buried behind the brick and terra cotta fireproofing of the modern building will probably last intact for a great number of years, because they are not subjected to any destructive influences. They have not as yet been on the market for a sufficient length of time to afford a test showing the full measure of their durability under conditions of this kind.

In the foregoing, it has been the endeavor to put the reader in possession of some knowledge of the different classes of metal protective coatings, and to show him that while there are undoubtedly good paints in all of the classes that have been mentioned that will serve the purpose satisfactorily, the experience of those who have studied the subject has been too varied to enable anyone to say that any particular paint or even any particular class of paint is the best protective coating for structural metal work. But it can be said without any fear of contradiction, that when considering the question of the proper selection of a paint for structural metal work, the question of price should not be allowed to influence the choice. Cheap paints are dear at any time and specially so on structural iron and steel, for they afford a fancied sense of security while in many cases they are an actual menace to the safety of the building, since they promote rather than retard rust. It requires thought, labor and experience along certain lines to produce satisfactory metal paints. The pigment must be finely ground and thoroughly incorporated with the vehicle by grinding, whether it be linseed oil or varnish. And even when the best possible paint is selected, all will go for naught unless the surface of the steel is properly prepared by previously removing all scale or rust so that the metal is clean and bright before painting.

At the meeting of the American Society for Testing Materials, held at Atlantic City in June of this year, a paper was read by Mr. F. P. Cheesman, on painting steel cars, which contains many suggestions of equal value for painting structural ironwork. As a pigment for priming ironwork he particularly recommends blue lead mixed with raw linseed oil and a small portion of pure turpentine drier. Blue lead is a sublimed lead, the chemical composition of which is lead sulphate and anhydrous oxide of lead. It is produced by the smelting or sublimation of non-argentiferous lead ore. The blue color is due to the presence of lead sulphide and also to small portions of carbon that come from the Connellsville coke used in the process of smelting. Blue lead has the peculiar property of preventing rust from spreading under its surface. When iron is painted with red lead, or with oxide of iron or carbon paint, if any break occurs in the paint surface, and rust begins at that spot, the rust will spread under the paint in all directions, so that the metal may be badly honeycombed with rust even though the paint surface is intact. Experiments made with blue lead painted over part of a sheet of steel showed that although the unprotected part of the metal became badly coated with rust after exposure, the portion protected by the coating of blue lead remained perfectly bright. This is important in repainting, for the rust need only be scraped away from the surface where it shows, while in the case of all other paints, the entire surface must be scraped before repainting. The reason for this peculiarity of blue lead is that it appears to cling closer to the surface of the metal than either red lead, iron oxide or carbon paints. Mr. Cheesman also urged that when work is hurried, only one coat of paint should be given, using very little driers, in preference to two coats loaded with driers so as to make them harden quickly. It is a well-known fact in painting that the greater the amount of drier used, the quicker the paint will perish.

COLORING OR PAINTING COPPER

It sometimes happens that it is desirable to either hasten the natural darkening of a copper cornice or other sheet copper work, or else to paint it in order to bring it in color harmony with its surroundings. This work requires special preparation, and it is not always understood by painters.

To turn copper green it should be brushed over repeatedly with a solution of four ounces of nitrate of iron and four ounces of hyposulphite of soda in one quart of water. When the desired effect is obtained it is rinsed with clear water.

To make oil paint adhere to copper or brass, it is necessary to first roughen the surface of the metal by washing it with a solution of four ounces of sulphate of copper in a half gallon of water, acidulated with one-eighth of an ounce of commercial nitric acid. On a surface so prepared, a paint which is not too oily will adhere firmly and not peel off.

STAINING SHINGLES

Wherever shingles are used either on the roof or the sides of a house, the most practical method of finishing them is by means of stain. When a shingle roof is painted, it is almost impossible to avoid having some of the paint run down between the shingles, forming little dams that will hold back some of the water from every rain storm, and this water will soak in through the edges of the shingles and will frequently cause them to rot. As a matter of fact, painting a shingle roof does not prolong the life of the roof at all, but tends rather to shorten it. Shingles that are left bare of finish will usually outlast a painted shingle roof. If however, the shingles were dipped in paint before they were laid, then this objection would be overcome, but while such a method of finish would answer very well for a time, when renewal became necessary, it would be impossible to avoid getting some of the paint into the spaces between the shingles.

Shingle stains not only offer a safe and convenient method of coloring shingles, but they are decidedly artistic, because of their soft effect, and also from the fact that the stain does not act absolutely uniform upon every shingle, nor indeed on every portion of the same shingle, hence there is a very pleasing play of color upon the surface, although the general effect is uniform.

The two principal varieties of shingle stains are oil stains and creosote stains. The first consists of linseed oil with enough of the ordinary pigment tinting colors mixed with it to color the wood, and a certain amount of drier. In other words, oil stains are a very thin paint used for dipping purposes. Even if they are brushed on, the body of the stain is not sufficient to cause dams of paint. Any painter can mix a satisfactory oil stain. The best colors to use are the non-fading earth pigments, such as umber and sienna, ocher, Van Dyke brown, Venetian red or lamp black.

Although anyone can mix a shingle stain using creosote as a vehicle, the term "creosote shingle stains" is a trade-mark and can be used only by the manufacturer who first introduced them. The advantages which creosote stains possess over oil stains is that they penetrate more deeply into the wood, and being very slow to dry, last longer. For this reason they protect the shingle better against dry rot. Moreover, when shingles are dipped in creosote stain before laying, and are given another coat of the stain with a brush after being laid, mildew or fungus growth cannot establish itself upon the surface of the shingles as is the case with oil stains having pigments of a mineral or earthy base.

A stain made from inert pigment, ground in oil, thinned with pine tar, liquid drier and benzine or kerosene, has been known to hold its color well after an exposure of four years.

At the convention of the Ohio Association of Master Painters and Decorators, held in Cleveland in 1903, the subject of shingle stains was discussed at some length. A well-known Toledo painter recommended a stain made from two gallons of coal oil (kerosene) to one gallon of raw linseed oil, tinted to any shade or color desired. This he said would wear as well as any manufactured stain on the market and would cost about one-third as much. Another member stated that he had mixed some shingle stain using one pound of beechwood creosote to one barrel of crude oil and a small percentage of drier to prevent the color from running. This was tinted with the best quality of pigment color that could be bought, and the shingles dipped into this stain had held their color for twelve years.

Ordinary linseed oil paints, thinned with benzine, have been recommended for shingle staining, but are not advisable, for although the color holds out well, the shingles are apt to show evidence of dry rot.

Skilled labor is not necessary for dipping shingles. All that is needed is to have a large tub to hold the stain, which must be stirred every few minutes to prevent settling of the pigment. Into this stain the shingles are dipped for not less than two-thirds of their length, and are then stood on end to dry or rather to drain. The painters' unions, however, claim this to be painters' work, although any boy or handy man can do it. The second application of the stain, after the shingles have been laid, requires the services of a painter.

Best He Ever Saw

Your magazine is the best trade journal I have ever seen and is what has long been needed.—Edgar E. Disney, Eureka, Kan.

FARM BUILDINGS

HENRY H. NIEMANN

A Practical Duck House

SHOWING THE DIFFERENT ELEVATIONS AND CROSS SECTIONS WITH THE MATERIALS TO BE USED AND THE DIMENSIONS OF THE SAME—ALSO AN ILLUSTRATION OF A COW BARN WITH FLOOR PLAN

THIS month we are illustrating the second of the group of farm buildings built on Geo. B. Robbins' farm near Hinsdale, Ill.

The building here shown is the duck house, and is constructed upon a cedar post foundation. These posts are eight inches in diameter and rest on a two by twelve by twelve footing.

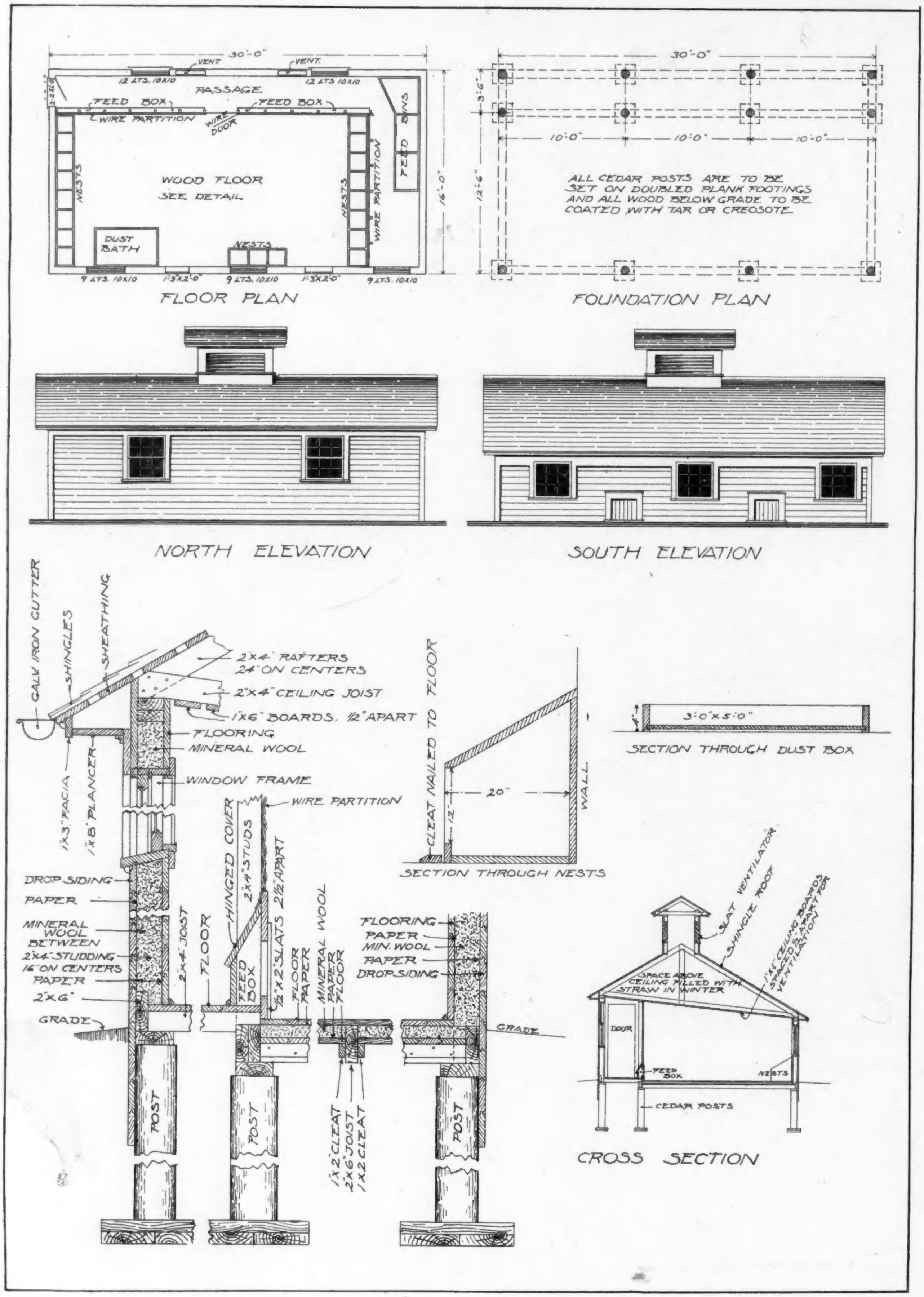
The duck house is 30 feet long, 15¾ feet wide and nearly 12 feet high.

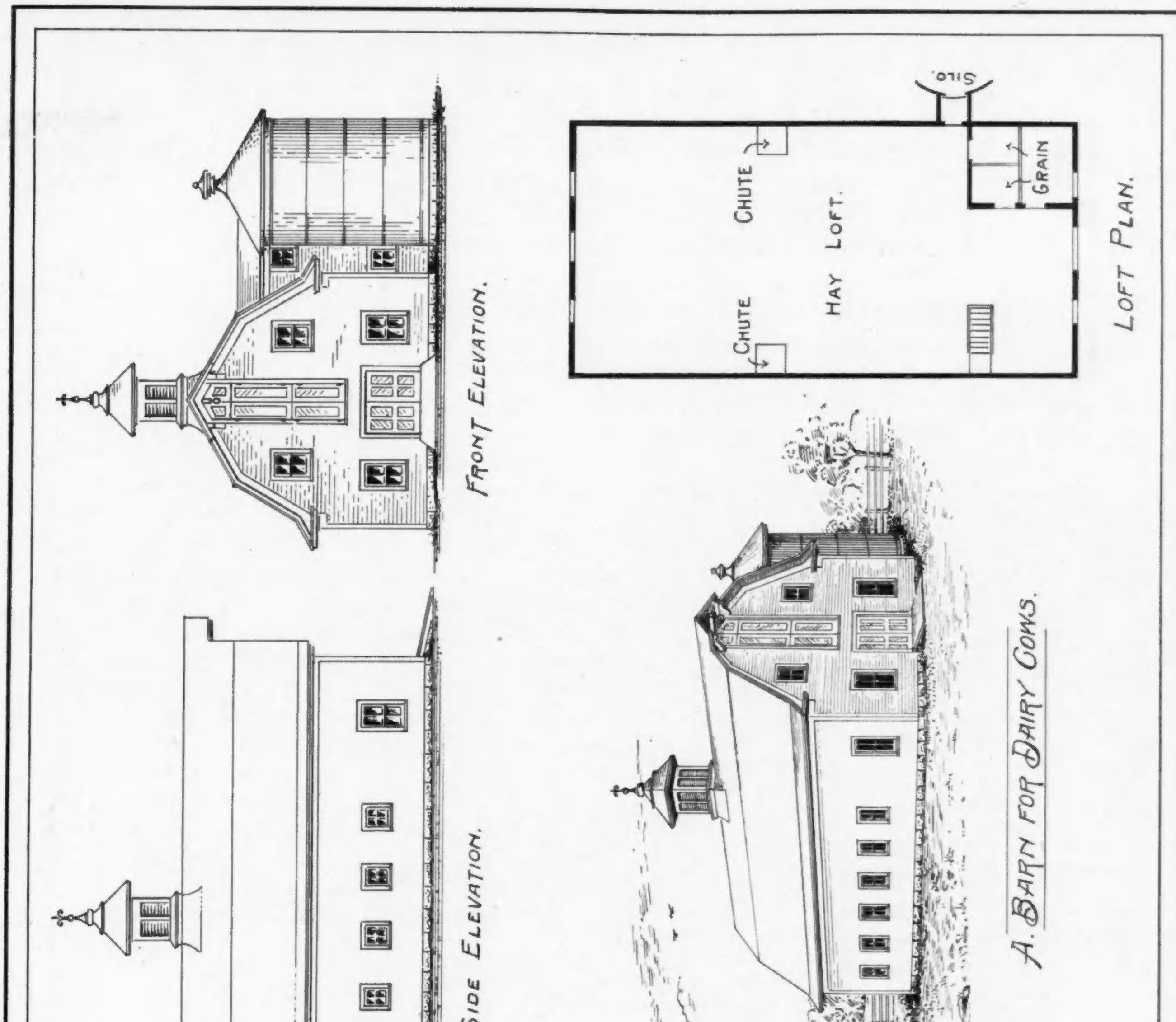
The construction of the floor is as follows: First, the rough flooring, which is covered with heavy paper. On top of this is a two-inch layer of mineral wool, which is again covered with heavy paper, and then the upper flooring is put on. The walls are constructed in like manner, with the exception of having drop-siding on the outside instead of flooring.

The nests are set on the floor and are removable, thus making it easier to clean them. The feed boxes extend along the passageway, and the feed can be put into them from this passage. Above the boxes is a wire partition, which affords a better circulation of air.

Although an exhaustive description of this house might be given, it is not necessary, as all parts, with their positions and dimensions, are given in the detailed drawing.

The illustrations here given are the several elevations and the perspective of a barn for dairy cows. An important feature is the silo which is shown in connection with the barn and the place where it should be located. The barn is 81 feet long and 40 feet wide and can house twenty-four cows. The feed alleys are along the outside wall, while the manure troughs are along the middle driveway. This arrangement makes it easier to clean out the stable.


30'-0"
VENT.
12 LTS. 10X10
PASSAGE
FEED BOX
WIRE PARTITION
WIRE DOOR
FEED BINS
NESTS
WOOD FLOOR
SEE DETAIL
WIRE PARTITION
16'-0"
DUST BATH
9 LTS. 10X10
1'-3"X2'-0"
FLOOR PLAN
3'-6"
12'-6"
10'-0"
ALL CEDAR POSTS ARE TO BE SET ON DOUBLED PLANK FOOTINGS AND ALL WOOD BELOW GRADE TO BE COATED WITH TAR OR CREOSOTE.
FOUNDATION PLAN
NORTH ELEVATION
SOUTH ELEVATION
GALV. IRON GUTTER
SHINGLES
SHEATHING
2"X4" RAFTERS 24" ON CENTERS
2"X4" CEILING JOIST
1"X6" BOARDS, 1/2" APART
FLOORING
MINERAL WOOL
WINDOW FRAME
1"X3" FACIA
1"X8" PLANCER
WIRE PARTITION
HINGED COVER
2"X4" STUDS
1/2"X2" SLATS 2 1/2" APART
DROP SIDING
PAPER
MINERAL WOOL BETWEEN 2"X4" STUDDING 16" ON CENTERS
PAPER
2"X6"
2"X4" JOIST
FLOOR
FEED BOX
FLOOR PAPER
MINERAL WOOL PAPER FLOOR
GRADE
POST
1"X2" CLEAT
2"X6" JOIST
1"X2 CLEAT
FLOORING
PAPER
MIN. WOOL
PAPER
DROP SIDING
GRADE
CLEAT NAILED TO FLOOR
20"
12"
WALL
SECTION THROUGH NESTS
3'-0"X5'-0"
SECTION THROUGH DUST BOX
SLAT VENTILATOR
SHINGLE ROOF
1"X6" CEILING BOARDS SPACED 1/2" APART FOR VENTILATION
SPACE ABOVE CEILING FILLED WITH STRAW IN WINTER
DOOR
FEED BOX
NESTS
CEDAR POSTS
CROSS SECTION



FRONT ELEVATION.
SIDE ELEVATION.
END SECTION.
A. BARN FOR DAIRY COWS.
LOFT PLAN.
SILO.
CHUTE
CHUTE
HAY LOFT.
GRAIN
FLOOR PLAN
SILO
FEED ALLEY.
MANURE TROUGH
DRIVE WAY
MANURE TROUGH
FEED ALLEY.
MIX. R.
HELP R.
OFFICE
40' 0"
81' 0"

MANUAL TRAINING

IRA S. GRIFFITH

Something the Boys Can Make

HOW TO MAKE A HEXAGONAL WOOD TEA-POT MAT—ALSO A PLATE RACK, WHICH WILL MAKE THE DINING ROOM ATTRACTIVE

IT IS often desired to place upon the table a hot tea-pot. This cannot be done without causing injury to the linen unless the tea-pot be placed upon something which will not conduct the heat. Wood is a good non-conductor of heat, and I shall describe the manner of making a wood tea-pot mat.

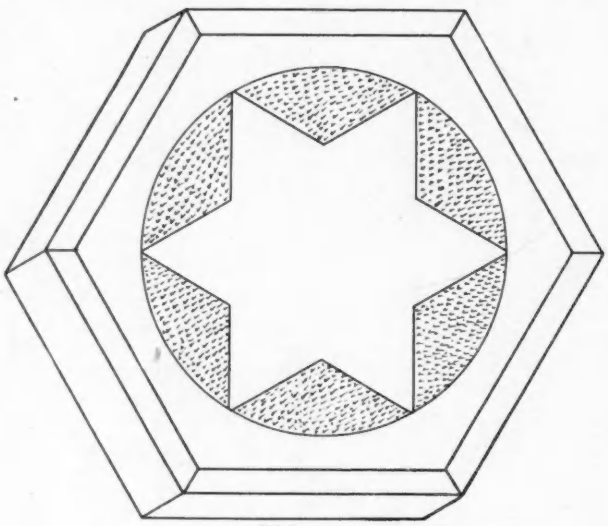


FIG 1.

Fig. 1 shows a hexagonal mat with decorations. Any other shape could have been used as well, such as a square, circle, pentagon or octagon. I have chosen to describe the hexagon because it will introduce the beginner to some new principles in the working of wood and also because of the ease with which the hexagon can be formed.

Fig. 2 gives the dimensions of the mat. The diagonal, or distance from one corner to the opposite corner, is six inches. The thickness is three-quarters of an inch. There is a bevel of one-quarter of an inch on the upper edge. Beveling is one form of champering. Champer is a carpenter's term and means to cut away the corner where two surfaces meet. A champer may be in the form of a curve. Fig. 3, A, or it may be a flat surface made at any angle to the original surfaces. Fig. 3, B. If it is a flat surface it is called a bevel.

It will be advisable for those who are not adept in the use of tools to use soft wood for this mat, such as white pine or whitewood. I should advise those who are able to work in harder woods to use black walnut as it makes a much prettier mat.

You were told in a previous description that most all pieces of wood were squared up according to the same rules. Occasionally, some of the steps in the operation of squaring up can be omitted without diminishing the accuracy of the work. In making this mat it is not necessary to square up the ends.

See that one face is smooth and level; gauge and plane so as to secure another surface parallel and at a distance of three-quarters of an inch from this one.

Set the dividers to three inches between the points and describe a circle on the side first planed. Draw lightly, with pencil and rule, a line through the center of the circle in the same direction as that of the grain of the wood. Without having changed the dividers, place one prong at one of the points where the line just drawn cuts the circle, and with the other make a mark on the circumference of the circle on each side.

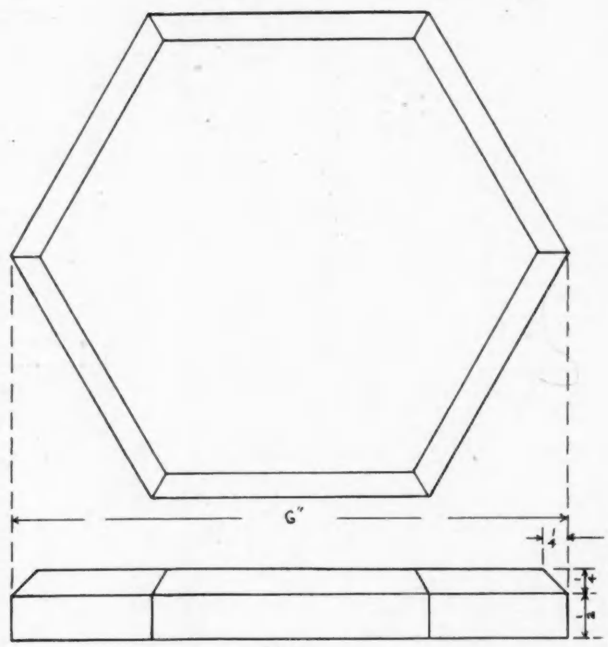


FIG. 2.

Fig. 4. Repeat on the other side of the circle. Connect these points of intersection with straight lines and a hexagon is formed each side of which is three

inches, or of the same length as the radius of the circumscribed circle.

With the back-saw cut along these lines, leaving about one-sixteenth of an inch for planing. Care must be taken to hold the saw so that it will make a

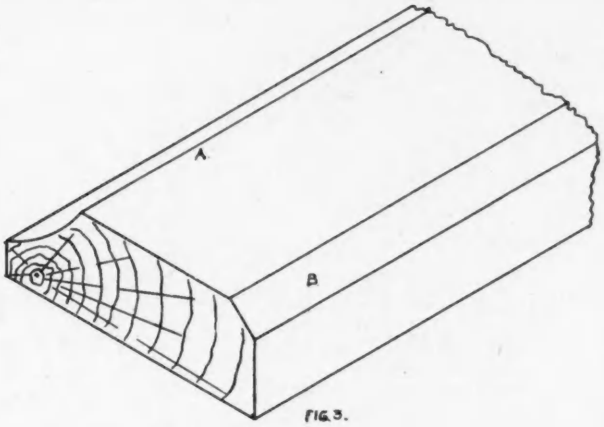


FIG. 3.

cut which shall be at right angles to the surface upon which the hexagon was drawn. The most common mistake beginners make is to saw to the line on the face side, but, by neglecting to watch the position of the saw, find when they get through sawing that they have ruined the piece by cutting so far below on the other side that the edge cannot be planed so as to get a right angle to the surface without going below the line to which they were working.

In all sawing the saw should be held in one hand only. The other hand should grasp the board near enough to the kerf so that the thumb can act as a

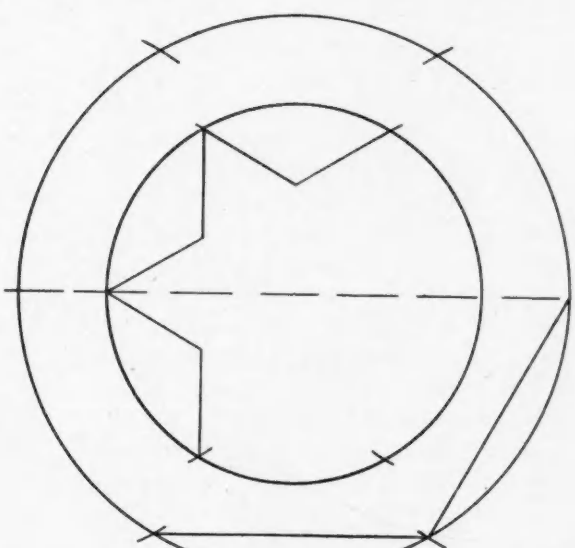


FIG. 4.

guide when the saw is being started. The saw should be started on the backward stroke, else it may catch and tear the wood. Little or no pressure on the saw is needed. In fact, most work with the back-saw should be done with a light lifting stroke. Begin at the far corner, holding the saw at an angle of about forty-five degrees to the horizontal. Gradually lower the handle while cutting until the teeth assume a horizontal position. Employ a long, steady stroke, so as to bring as many teeth into use as possible.

Plane the edges, testing frequently with the try-square. It will be seen that the hexagon has two sides parallel to the grain of the wood if it has been laid out according to the directions. Plane these two sides first. They can be planed in either direction; but the other sides can be planed in but one direction, in the general direction of the grain.

In laying out the bevel, a pencil-gauge is almost a necessity. If the ordinary gauge point is used a groove is cut in the wood which cannot be removed by the plane. A pencil gauge can be made by boring a hole in that end of the gauge stick which does not contain the spur, a little smaller than the size of an ordinary pencil. Fig. 5.

Set the gauge, by measuring with the rule to one-quarter of an inch and gauge around the edge and top.

Place the mat upright in the vise and, holding the plane at an angle of forty-five degrees, plane carefully to the pencil lines. Plane, first, the two bevels which

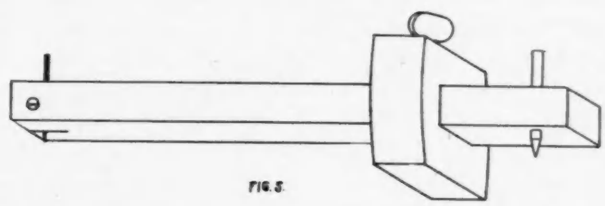


FIG. 5.

are parallel to the grain; then the other bevels, planing them in the general direction of the grain.

Carefully sand-paper the mat, using a sand-paper block. See that the block is held firmly so as to get nice sharp edges.

The design shown in Fig. 1 can be made as follows: Find the center of the block by finding where the diagonals meet. With pencil and compass, describe a circle having a radius of two inches. Mark off this circle as if you intended making a hexagon. Fig. 4. But, instead of connecting every point with the one next to it, omit one point each time so as to connect every other point. This gives a six-pointed star. The lines must be drawn lightly so they can be erased.

The carving can be done by cutting a small V shaped groove around the outline and stamping the background with a nail filed so as to have four sharp prongs. Hold the nail about a quarter of an inch above the surface to be stamped and strike light blows with the hammer or mallet. In this way the stamping can be done rapidly, as no effort is required to raise the nail. The effect is better if no attempt is made to have the markings arranged in regular order.

For black walnut, the best finish is obtained by wiping the mat with a cloth saturated with linseed oil. For soft wood, use a stain.

Brass tacks with round heads may be placed over the mat, such as at the points of the star, and will keep the wood from being discolored besides adding to the appearance.

PLATE RACK

A pretty piece of furniture for the dining room is a plate-rack. A few pretty pieces of china on such a rack as is described below help to brighten the room wonderfully.

The design, Fig. 6, originated in the Manual Training Department of the Chicago schools. It has been used many times and is quite satisfactory, although the present leaning towards the plain, straight lines of the Mission style of furniture may make the curves on the end pieces seem overdone to some. By such persons, the ends may be modified to suit their individual tastes without affecting the other dimensions.

Hard or soft wood may be used. If a dead black, such as is so common to-day, is desired, soft wood will do as well as hard.

Secure a piece of stock dressed on two sides to a thickness of seven-eighths of an inch. It should have a width of ten inches and length of about twenty-seven or eight inches. From this piece the top and end pieces can be got; and, if you are unable to purchase the three-quarter inch dowel rod, that also can be made from this piece of stock.

For the slats on the back and for the trough which supports the plates, one-half inch stock dressed on two sides should be used.

Get out the top first by planing up a piece of seven-eighths inch lumber to twenty-six inches long by four and one-half inches wide.

Next square up two pieces of the same thickness to thirteen inches long by three and three-quarters inches wide.

Out of the one-half inch stock, square up two pieces twenty-four inches long by three inches wide; and one piece twenty-four inches long by one and one-half inches wide. These three pieces are for the slats which make up the back of the rack.

It might be well, while the one-half inch stock is out, to square up two pieces about twenty-four inches long by one inch wide. Only one end of each need be squared, as the correct length is to be but twenty-two and one-fourth inches. It is best to cut these pieces longer than is needed so they can be fitted after the other pieces have been nailed in place. These two pieces are for the trough which supports the plates.

Care should be taken in laying out the curves of the end pieces to see that a smooth flowing curve, that is, one that has no abrupt turns in it, is obtained. If it is desired to change the design, a curve can be drawn free hand on a piece of paper and this paper used as a pattern. The pattern should be made full size.

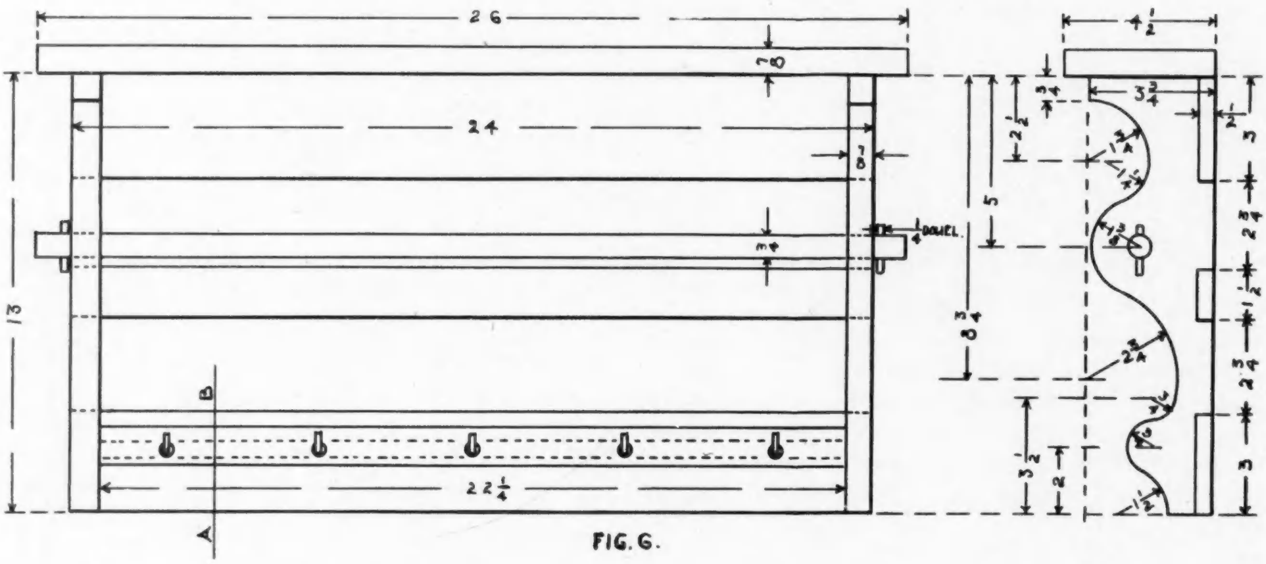


FIG. 6.

The design given in Fig. 6 is made as follows: Take one of the pieces which you have squared up to thirteen inches by three and three-quarters inches. Beginning at the end which is to be the top, measure along an edge two and one-half inches. Set the dividers to one and three-quarter inches between the points, and describe nearly a half circle from the point just located. It will be necessary to hold another seven-eighth inch block beside the piece upon which you are working in order to properly place the point. The dividers should have pencil attachment, otherwise a pencil compass should be used.

With trysquare and pencil, draw a line across the piece at the point just used to describe the half circle. Set the dividers to one and a quarter inches. Place them so that one point will be on this line while the other touches the half circle just drawn, at the point in which it crosses this same line. Draw a little more than a quarter circle.

Measure along the edge of the piece five inches from the top and, with trysquare and pencil, square a line across the piece. Set the dividers to one and three-eighths inches. Place them so that when one point is on the line the other will describe a circle tangent to the other circle last drawn. One circle is tangent to another when their circumferences touch without crossing. Draw a half circle.

Again measure from the top along the edge eight and three-quarter inches. With trysquare and pencil square a line across at this point. Set the dividers to

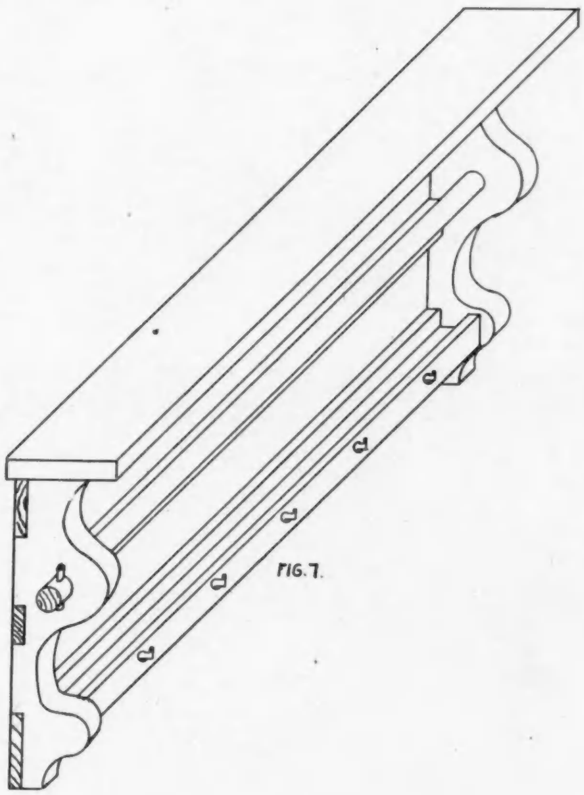


FIG. 7.

two and three-quarters inches. Place them so that when one point is on the line the other will make a circle tangent to the circle just drawn and draw nearly a quarter circle.

Now, begin at the bottom of the piece. Set the dividers to one and a half inches. Measure from the back, along the end one and three-quarters inches. The drawing indicates a measurement of three-quarters of an inch at this point, but to this must be added one-half an inch unless the groove for the bottom slat has been cut. Place the dividers so that one point shall rest on the point just located while the other is placed on the bottom edge of the piece, and draw a quarter circle.

Measure up the edge of the piece two inches and square across with trysquare and pencil. With a three-quarter of an inch radius, placing one point on the line and the other so that it will make a circle tangent to the one last drawn, draw a half circle.

Again, measure from the bottom of the piece three and one-half inches and square a line across. With the three-quarter of an inch radius, place one point on this line and describe an arc of a circle which shall complete the curve.

Bore a three-quarter inch hole at the point marking the center of the curve made from the line measured five inches from the top. Bore from one side until the point or spur shows on the other side, then finish the boring from that side.

Saw out the curve with a turning saw and smooth with spokeshave, or rasp, scraper and sand-paper.

This piece can be used as a pattern by which to lay off the other one.

With knifepoint and trysquare, lay out the gains which are to receive the slats on the back. The first one is three inches long, measured from the top; the second, one and one-half inches long measured two and three-quarter inches from the one just laid out; the third, three inches measured from the bottom. They are gauged one-half an inch deep. It is taken for granted that you know how to lay out and cut these gains. If you do not, read the article on making a chisel rack in the July number of this magazine.

Plane, scrape and sand-paper all mill marks and other irregularities of the surface on all the pieces.

The three-quarter of an inch dowel rod should be twenty-six inches long. If you are unable to secure a rod one can be made by squaring up a piece of stock to three-quarters of an inch each way, then gauging with the pencil gauge set to one-quarter of an inch. This will make an octagonal prism or eight sided solid when the four corners have been planed to the gauge lines. Again, plane these corners just produced and a solid of sixteen sides is obtained. This can be changed to a cylinder by the use of the scraper and sand-paper.

Place one of the end pieces in the vise and nail on to it the three slats. Hold the trysquare against the end piece with the blade along the slat, when one nail has been put in place, to see that the slat and end piece make a right angle with each other. Be careful that the nails do not go through, so as to show on the face edge of the end pieces.

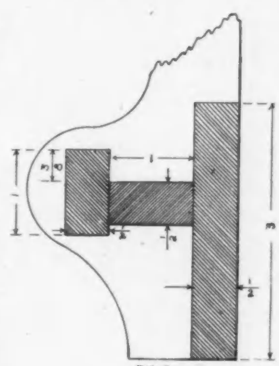


FIG. 8.

Put the dowel rod in place after having bored a quarter of an inch hole in each end twenty-four and one-quarter inches apart from center to center.

Nail the slats to the second end piece, being sure to have a solid support for that part of the end piece into which you are nailing. Nail the top in place after planing any irregularities on the ends of the rack.

The bottom of the trough which supports the plates should next be fitted. Place the end which has been squared against the end of the plate rack, and with the knife carefully mark the lengths. Square around and saw and fit this in place, nailing it from the back of the lower slat. Next fit the face of the trough in like manner, nailing it to the bottom of the trough. Nail so as not to interfere with the placing of the cup hooks, yet so the heads will be covered by the base of the hooks.

The little one-quarter inch dowels which act as keys to the longer rod are an inch and a quarter long.

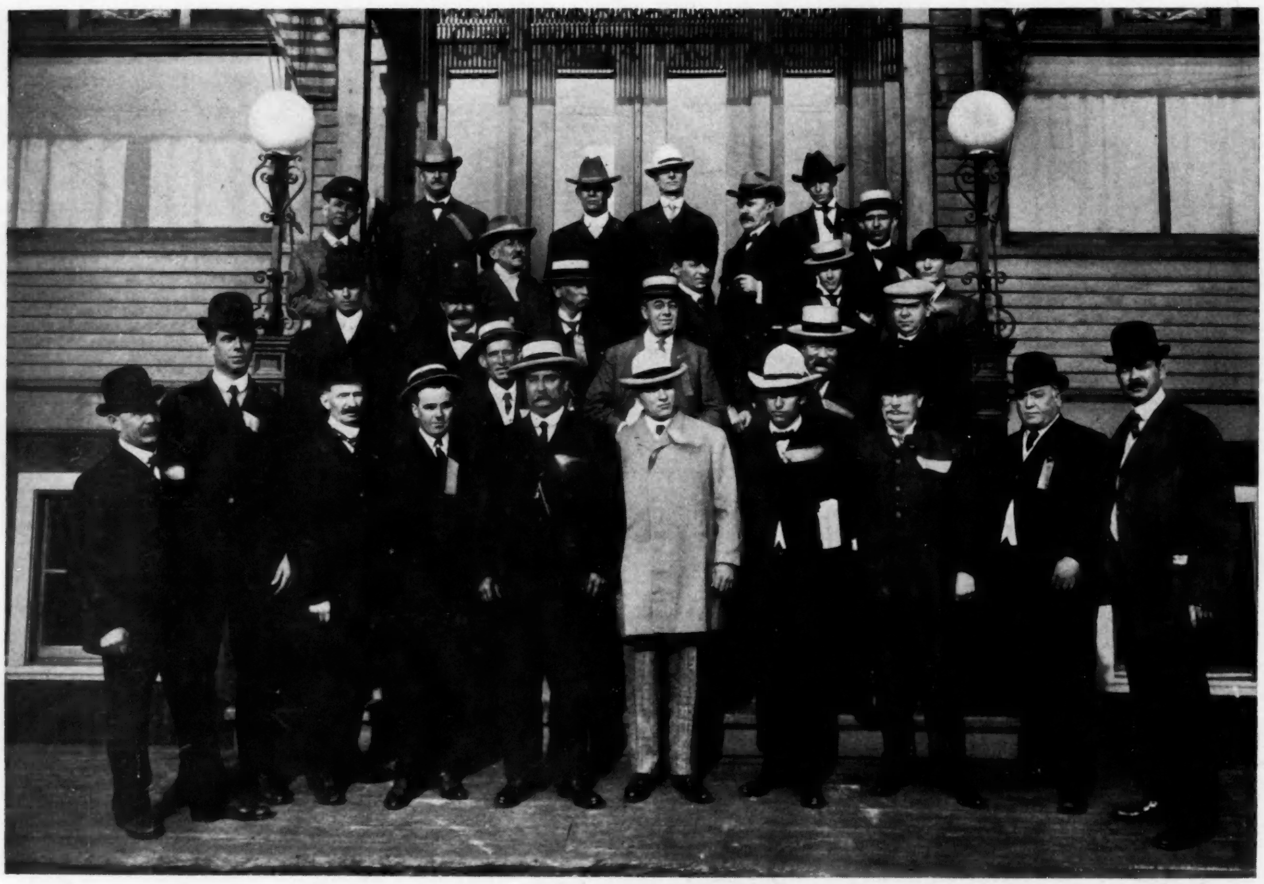
The cup hooks are five in number. Place one in the middle; one each, two inches from the ends, and divide the remaining spaces equally. These hooks should not be put in place until all finishing has been applied. If oak has been used small holes must be drilled to receive the screws.

A dead black finish, such as dead black Japalac, seems to be the most popular for plate-racks at present. This finish is suitable for either soft or hard woods.

Concrete Block Machinery Manufacturers

FIRST ANNUAL MEETING OF AN ORGANIZATION WHICH IS AT THE FOUNDATION OF A PRODUCT THAT IS ALMOST REVOLUTIONIZING THE BUILDING INDUSTRY

THE recent convention of the Concrete Block Machine Manufacturers' Association of the United States is of such great importance that the AMERICAN CARPENTER AND BUILDER is forced to break over its rule of not being a "news" paper, and make at least a brief mention of the proceedings. Concrete block construction is advancing with tremendous strides, and the demand for machines to manufacture the blocks has increased in proportion, until new companies and new machines have been springing into existence rapidly and continually.



Sid. L. Wiltse, secretary of the Cement Machinery Company, of Jackson, Mich., realizing the importance of getting these various manufacturers together for the discussion and settling of questions of the greatest importance to them all, through his commendable efforts succeeded in promoting a representative gathering at the Great Northern Hotel, Chicago, where a convention was held lasting two days, June 27 and 28.

The meeting was attended by nearly all the machine manufacturers of the country and was given up solely to the helpful and practical discussion of questions pertaining to the manufacture of concrete blocks, important steps being taken toward securing uniform and special insurance rates for buildings constructed of concrete blocks, a reduction of freight rates, the fixing of uniform sizes of concrete blocks, and along various other similar lines that cannot fail to be of benefit to the manufacture of the machine.

The organization was made permanent and will meet annually in June at a place to be designated by the officers. Officers were elected as follows: President, J. F. Angell, Winget Concrete Machine Co., Columbus, Ohio; vice-president, O. U. Miracle, Miracle Pressed Stone Co., Minneapolis, Minn.; secretary, Sid. L. Wiltse, Cement Machinery Co., Jackson, Mich.; treasurer, C. C. Huston, Blakeslee Concrete Block Machine Co., Columbus, Ohio.

The officers selected are well chosen, as they are all men thoroughly familiar, not only with the manufacture of machines, but with the manufacture of the blocks also, and are thus able to do much toward the advancement of the interests of the organization. Some of the more important questions will undoubtedly be settled by the time of the next meeting.

J. F. ANGELL

O. U. MIRACLE

S. L. WILTSE

C. C. HUSTON

Desirable Houses

SHOWING THE FLOOR PLANS AND GIVING THE MATERIALS USED IN THE CONSTRUCTION OF THE BUILDINGS—PLEASING FEATURES POINTED OUT

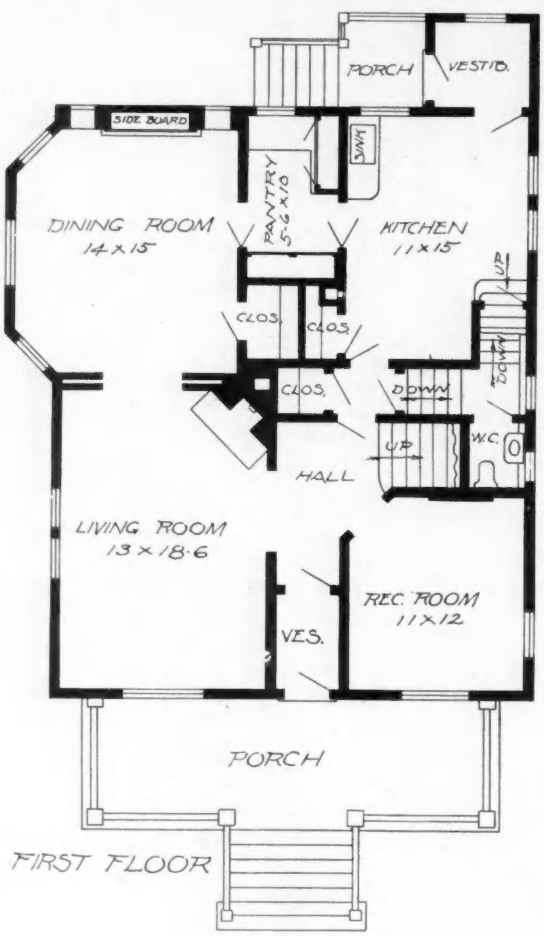
THREE residences are shown this month, ranging in cost from $750 to $2,000. These are designs of practical houses, all of which have been built in various parts of the country. Attention is directed to some of the more desirable features in each case, and from the perspectives and floor plans given the carpenter and builder should have little difficulty in preparing details and working plans for his use in construction.

The house on page 334 is being completed in Cook county, Ill. The entire interior finish of the house is in oak. The floors also are oak with the exception of the kitchen and bath room where maple has been used. The large fireplace which is located in the living room is of brick and while is serves its purpose it also aids very materially in furnishing the room. The cellar which extends under the entire house has a cement floor and is equipped with a hot-water heating plant. The dining room has a side-board built in, and it has the same finish as the rest of the room.

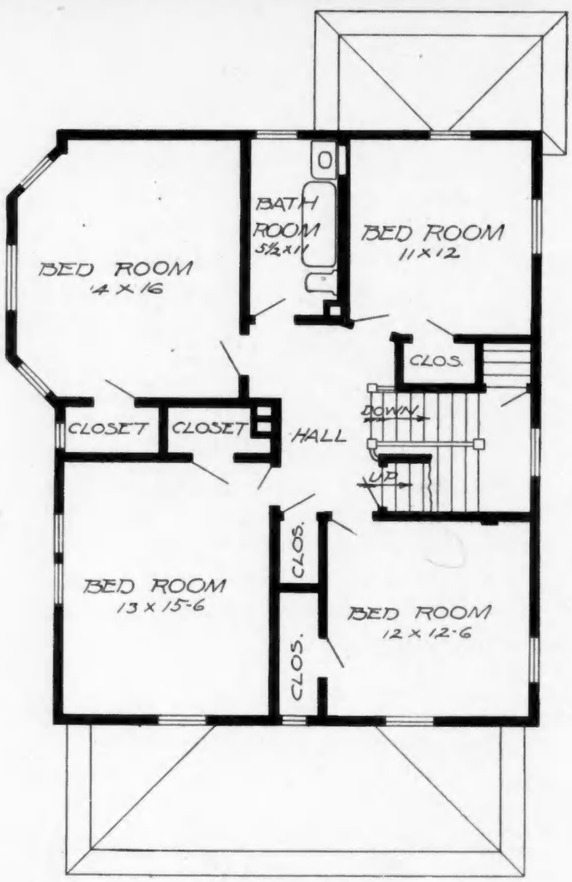
The second floor contains four bedrooms and a bath room which is well located at the end of the hall. Above the second floor is a large garret with a stair leading up to it. This can be fitted up into two bedrooms if desired. The general appearance of the house is made more attractive by the large porch which extends across the entire front. The roof is covered with shingles, which are stained moss green.

The house on page 335 was built in Winnebago county, Wis. The interior arrangement is pleasing and has many features that make the house comfortable. The large reception hall contains a stairway, and is divided from the living room by sliding doors. The kitchen is well equipped with a pantry and cupboards and the dining room has a large china closet which adds very materially to its appearance. The dining room is well located, being away from the front entrance, thus affording greater privacy to the family. The second floor is divided into four bedrooms and a bath room. The bedrooms are all large and have clothes closets. The garret can, if desired, be fitted up into two bedrooms or else it can be used as a storeroom. The house is heated by means of a furnace and a good sanitary plumbing system is installed. The basement which extends under the entire house, has a cement floor and contains ample room for the heating plant, fuel room and storage room. The large porch with its pillars adds to the outer appearance of the house besides affording comfort to the occupants.

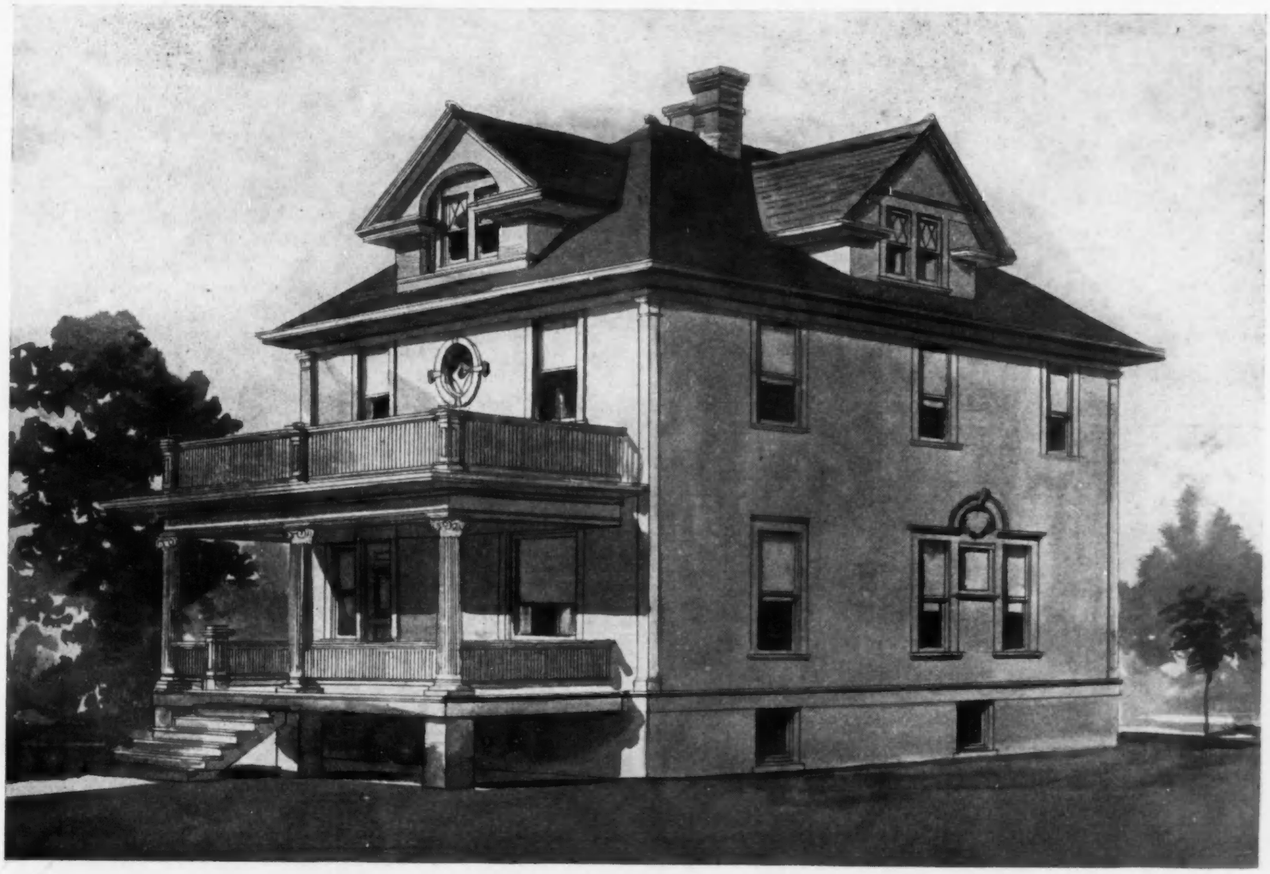
The house on page 336 is both practical and neat. The body of the house is twenty-six by thirty-two feet, and contains eight large, well proportioned rooms. The cellar extends under the kitchen and dining room and can be used as a store room. The open stairway in the living room, the fireplace in the parlor and a direct passage from the front to the kitchen are some of the very desirable features. A large pantry with plenty of cupboards and shelves is accessible from both kitchen and dining room. The second floor contains four bedrooms and a bath room, which has good sanitary plumbing. The porch which extends across the entire front of the house is a splendid place for the family to gather, especially in hot weather.

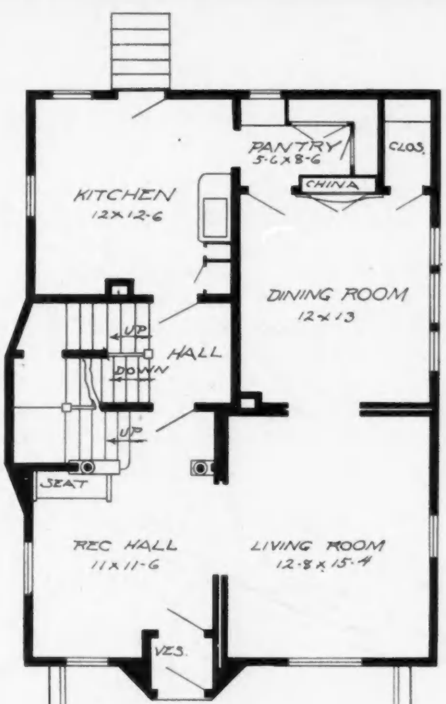


FIRST FLOOR

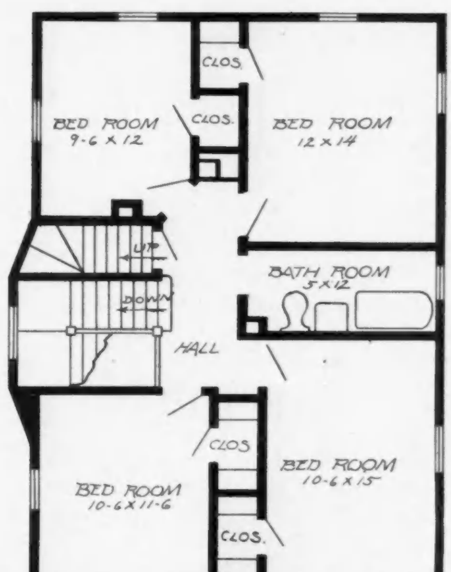


SECOND FLOOR PLAN

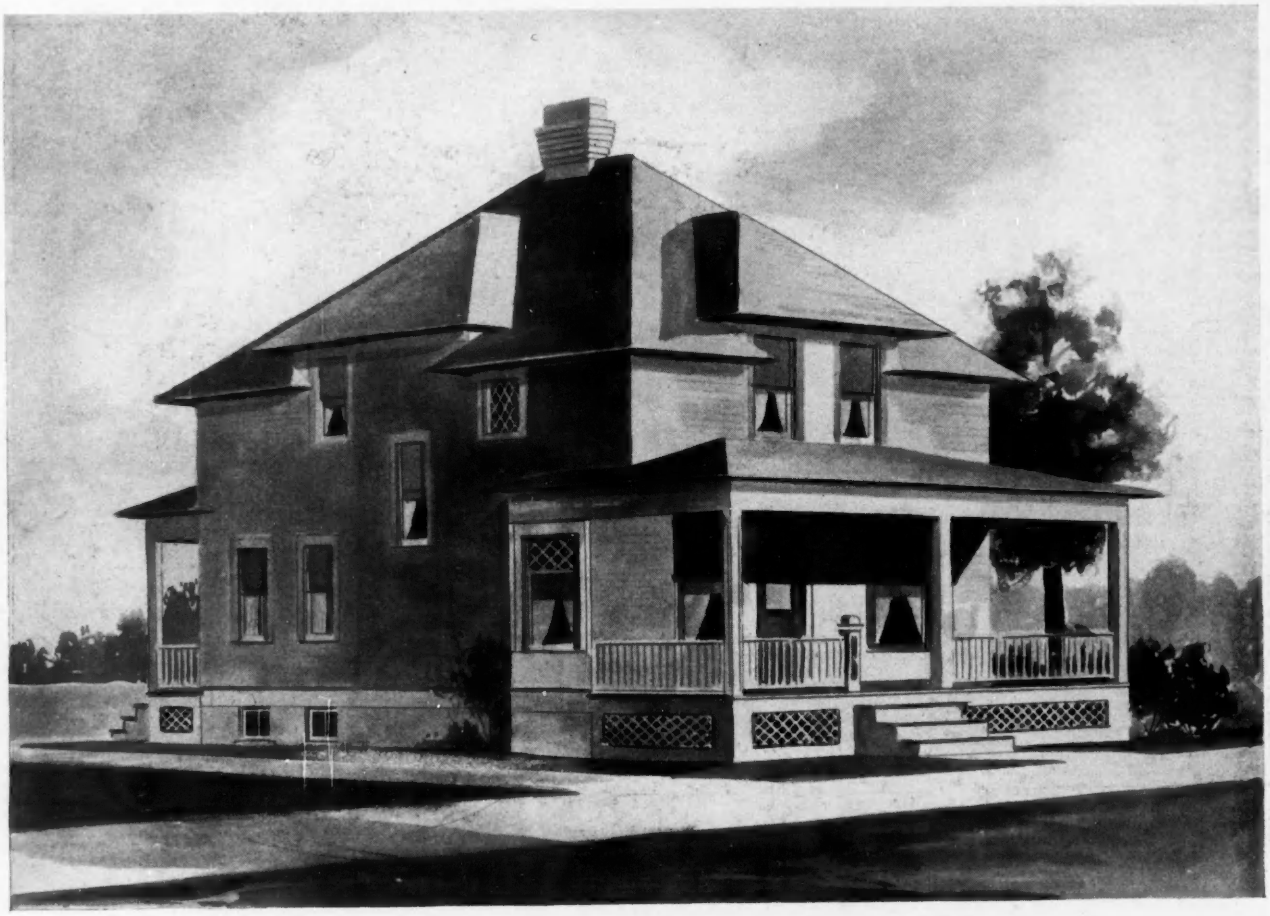


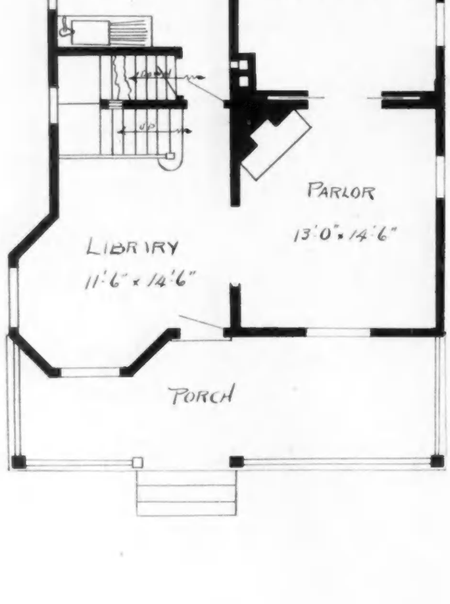


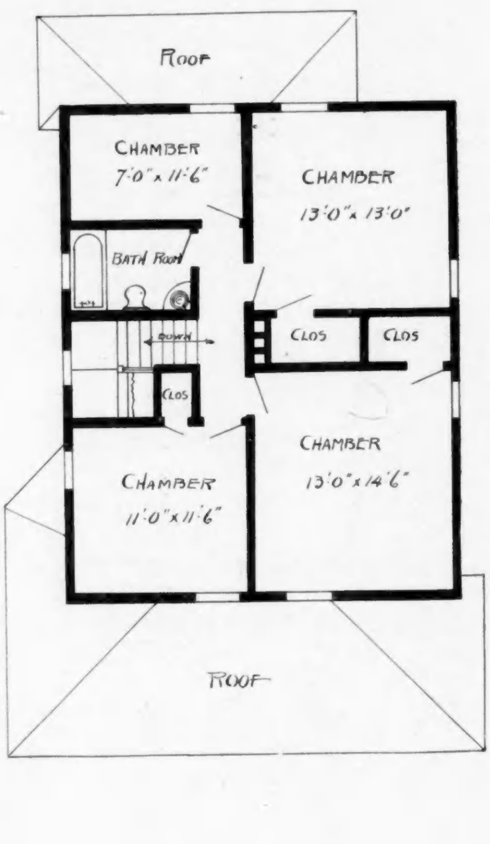
FIRST FLOOR



SECOND FLOOR




PORCH
PANTRY
KITCHEN
11'6" x 13'0"
DINING ROOM
13'0" x 16'0"
DOWN
UP
PARLOR
13'0" x 14'6"
LIBRARY
11'6" x 14'6"
PORCH


ROOF
CHAMBER
7'0" x 11'6"
CHAMBER
13'0" x 13'0"
BATH ROOM
DOWN
CLOS
CLOS
CLOS
CHAMBER
13'0" x 14'6"
CHAMBER
11'0" x 11'6"
ROOF

Correspondence.

The Young Mechanic

As an introduction to this subject I wish to give a brief sketch of personal experience. To many of the gray-heads I know that it will be of but little interest except, perhaps, to recall to some of them their own boyhood days; but to the younger class, who are now seeking to solve the problems of the Square and Compass, it may, perchance, interest some of them to know what was meant by "Learning the Trade" forty or fifty years ago.

At the age of eighteen I was apprenticed to learn the trade of Carpenter and Joiner. I was "bound" for three years. By the articles of agreement I was to receive $50.00 the first year, $75.00 the second, and $150.00 and a "kit" of tools the third, and board. The above sums kept me in clothes, and I was also able to spend a quarter occasionally to take my best girl to a circus or minstrel show. I lived with the boss, worked ten hours a day and did chores mornings and evenings.

We didn't have much machinery in the town to get out work; the lumber to be used for finishing purposes usually came to the shop dressed; though not always, as, for instance, in making some piece of cabinet work it was considered better to have the lumber in the rough so that it might be faced up, taken out of wind, and then gauged and dressed by hand to a thickness. Most of the slitting we did by hand, using either the saw or a big handled and rollered slitting gauge. Most of our moldings were also worked out by hand, often using most, if not all, of the following tools on a single piece: Planes, gauges, plow, filletster, jack and side rabbet, gouges, hollows and rounds, beads and often others.

Many a time have I had a tool taken out of my hand by the "Old man," who would show me how to do the work as it should be done, and more than once taken to task for not having "common sense," just because I didn't go at some piece of work his way. Often I was tempted to tell him to get some one else in my place, and I would try another boss, but, where could I go? No one would hire me as a carpenter, not having served my time; I had to either remain or go at something else; I finally chose to stay.

The first six months took nearly all the conceit out of me, for I had prided myself as being "handy" with tools while on the farm; but I was not long in making the discovery that I had much more to learn, in order to become a mechanic, than cutting off a board and driving nails. As the months lengthened into years I became more reconciled to my surroundings; the scoldings eased up and, occasionally, I was entrusted to look after the work of some later arrival. My employer let no opportunity pass where he might be able to give instruction, whether it was with the broad-axe, square, compass or making a glue joint. He seemed to be under an obligation to teach me all that he could, and, if I did not fully appreciate the favor at that time, I have, often, in later years.

Apprentices, in those days, were usually not only given an opportunity to become masters of a trade, but made to do their work in the best possible manner, and if some failed to become experts it was, perhaps, that they had made a mistake in their choice and might have been better fitted for some other kind of work, or profession.

Many changes have taken place along industrial lines during the past forty-five years, and chief among them has been the passing of the apprentice.

It is no longer customary to ask a carpenter, "Of whom did you learn the trade?" And if you did, the answer in all probability would be, "Oh! I worked for Mr. A, and B, and C, I don't claim to be a first-class finisher, but I can do most any kind of ordinary work."

You are in need of more men; you want competent workmen if you can get them, but you happen to be so situated that you must take the first to apply. You hire this man—an able-bodied intelligent looking person of middle age. He brings his chest of tools on the job and a glance at the contents of that chest enables you to tell him what to go at. He takes out an old-looking rusty square, a couple of saws, rusted, kinked, without sufficient set, and poorly filed; a hatchet, hammer and try-square and his "chest" looks nearly empty.

Now, I would ask, how can such a man ever expect to become a mechanic? You put him at work at some rough job and keep him only long enough to tide over the present emergency. He may have some traits that you like, and you would be glad to set him at work that he had never done, put his tools in order for him and show him how to use them, but can you afford to do it? Can you pay $15.00 or $18.00 a week to teach this man?—one who should have received these lessons some years ago.

The young men of the present time are handicapped by a lack of proper instruction before they announce themselves as "carpenters." Some of them—and they are deserving of great credit—grasp every opportunity to advance themselves and become proficient in their line of work, but it is a heroic task to learn a trade in these days while posing as a "mechanic."

In order to become thoroughly proficient in his trade, the mechanic should serve a complete apprenticeship; the half-taught workman works at a great disadvantage. His motto should be: "A Master Mechanic, or no Mechanic at all." He should avail himself of every opportunity to the cultivation of his mind; reading such literature as pertains to his trade; acquainting himself, with at least, the elementary principles of geometry—and here let me say that, to mention geometry to some mechanics is only to broach a subject with which they think that they could never become familiar. This bugbear, "geometry," may be easily captured, by any one possessed of a common school education, or who understands the principles of the three Rs—"Readin', Ritin', 'Rithmetick." All you need to do is to get a book on elementary geometry, make a small drawing board, a T square, two small, thin triangles one 45 degrees and one 60 degrees, procure a pencil compass, a small pair of dividers and a protractor scale, and begin by copying each problem, just as given in the book, and you will be agreeably surprised at the ease with which many geometrical problems may be learned; and, once having acquired an insight into it, it becomes a pleasure, instead of a task, to unravel its seeming mysteries.

The young mechanic should learn to love these intellectual pursuits for two reasons: First, because he is a mechanic; and secondly, because he is a man. If the lawyer, the physician, and the preacher avail themselves of the assistance of literature and science in their several vocations, of how much more importance it is to the mechanic to do the same thing; for to none of those professions are the results of science so directly applicable. He should learn to appreciate such pursuits, because they are fitting and proper to him as a mechanic.

THOS. MOLONEY.

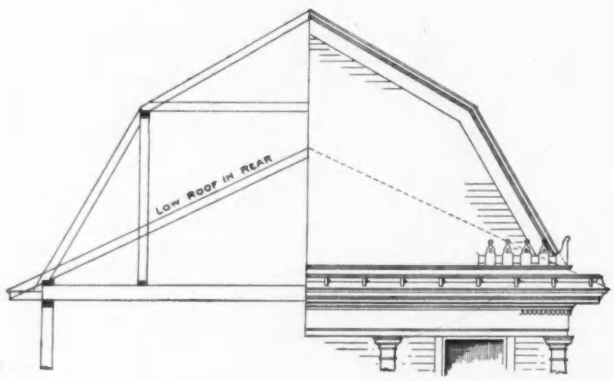
Gutter for Gambrel Roof

To the Editor: Richwood, Ohio.

I am figuring on a small cottage with a gambrel roof and I would like to know the kind of gutter which is best suited to this style of roof. The cornice is to continue all around the house, connecting with a veranda in front and a low hip roof in the rear.

EARL SLEMMONS.

Answer: The accompanying illustration shows about all there is to be said of a combination roof and gutter for a



house of this kind. The gutter is what is generally termed "Yankee gutter," and, as it is to run all around the roof, would suggest that the gutter be set near the eave with no shingles underneath, using instead a seven-eighths inch board to form the eave drip and on which to rest the brackets. Would set the gutter level and grade on the inside with false bottom. Use good quality of tin for the lining and start double course of shingles about level with top of gutter. If the hip roof in the rear interferes with the window space of the main part it could be changed to a deck roof.

A. W. WOODS.

Building a Concrete Store House

To the Editor: Rochester, N. Y.

We are planning the erection of a building in which we shall store trees and shrubs during the winter, and are considering concrete construction for the walls. We have investigated somewhat concrete blocks, but are inclined to think that we can build the wall more economically by building it up in forms and leaving an air space inside; that is, running up the six inch wall outside, then a four inch space and next a four inch wall, and if we can handle the forms economically, see no reason why it could not be done. The two sections of the wall to be tied together with iron ties nine inches long and turned up at each end one inch. Our idea has been to put up two by six studs the full height of the sall (sixteen inches) boarding up on the inside to make the outside form, then using a movable form for the inside one, about ten inches in length and twenty-two inches high, raising it up eighteen inches as the course was completed, leaving four inches lap on the course below, binding it to the outside form by wires, the under wires being cut when the form is to be lifted. The air space form to be made ten feet long, four inches wide at the top, tapering to three feet at the bottom, making what might be called a "wedge shape," which it seems to us could be easily loosened and raised when the concrete has hardened sufficiently to stand alone. Possibly this form could be made square instead of tapering, but we doubt whether it could be raised after the concrete sets, as it might bind, could not be gotten out. This air space form when raised for a new course would rest on the iron tie beams referred to, and it seems to us could be handled easily, quickly and economically.

CHASE BROTHERS CO.

Answer: Thos. J. Farrell, Washington, New Jersey, has the best system of monolithic (one piece) construction I have seen. Where labor is cheap and appearance is not an object this method is cheaper than hollow concrete blocks, but I find the hollow blocks far more speedy and reliable, as settling of concrete when mold (plunks) have been removed too early is a waste of material, besides causes large bulging of the wall. It will require very heavy bracing to keep a frame work sixteen feet high from expanding and such expanding requires much more material, besides is unsightly, and elevating the material sixteen feet high is expensive, also dropping mixed concrete through space even to the extent of three feet separates the cement from the sand and makes inferior work. Your idea of a six-inch outside wall, a four-inch air space and a four-inch inside wall is good, but dip your iron cross ties into hot tar just before placing, this will adhere to the concrete and prevent rusting. I would suggest the following method as superior and less expensive, viz.: Make solid blocks four by twelve by thirty-six inches or smaller. Lay these up and use flat iron ties (tarred). This will be cheaper, as two four-inch walls placed six inches apart will be strong enough. If you follow your original idea then make your air space form of solid wood, thus enabling you to jar it loose with a sledge, as I have been up against this very thing myself and know whereof I speak. Do not taper your air space form more than a quarter-inch per foot in height on each side. After all you will have cracks in your work, caused by changing your form, unless you use bolts and plate of some kind, such as the Farrell system referred to in the beginning of this article.

FRED W. HAGLOCH.

Laying a Cement Walk

To the Editor: Randolph, N. Y.

Please give me information on how to build a cement walk. I wish to dig down two feet and fill up eighteen inches with stone, then on top of this four inches of gravel or granting gravel-sand cement. Should I put in any cement among the stone that I first put in, or will the four-inch course be enough to unite them? If you have a formula will you please put it in your journal.

M. W. Sheaw.

Answer: Always start your concrete work below frost line. The following proportions are good. One part Portland or slag cement, three parts stone or gravel that will pass an inch ring, and three parts large stone up to four inches in diameter. I always commence concrete at the bottom of the trench, unless drainage is essential, then fill the first ten inches with stone four inches or larger in diameter, and fill top crevices with spalds or smaller gravel. Always moisten such footing before plaxing concrete.

FRED W. HAGLOCH.

Estimated Cost of Labor in Building

To the Editor: Idaville, Ind.

I would like to know how you estimate the price of labor of a house or barn and the amount of nails needed for a building.

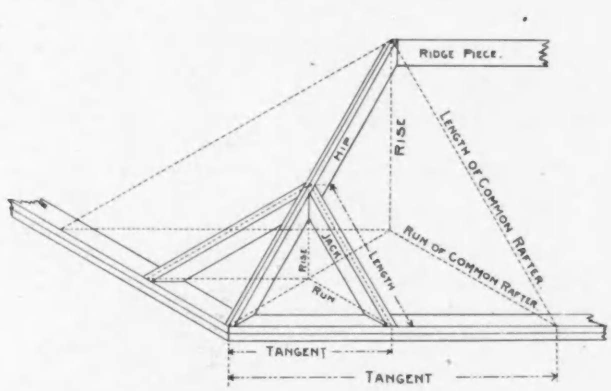
JOS. H. NEEL.

Answer: The easiest way to estimate the labor, and one that is practical, is to estimate rough work by the thousand feet of lumber, and the finishing a per cent of the cost of the mill work, thus: Estimate the labor of framing dimension lumber at eight to ten dollars per thousand feet, board measure; sheathing, eight dollars per thousand; flooring, twelve to twenty dollars, according to kind; siding, twelve to twenty dollars, according to kind, whether narrow or wide, or mitered corners or not; shingling, one dollar and one-half per thousand; cornice and belt courses, two to four cents per member per lineal foot; porches, one to one and one-half dollars per lineal foot for labor; finishing, thirty to thirty-five per cent of the cost of the mill work. Mill work includes the sash, doors, blinds, casing and base and all moldings. Nails per thousand feet required are about as follows: Framing, twenty to twenty-five pounds twelve to sixteen penny; sheathing, eighteen to twenty pounds eight penny; siding, fifteen to eighteen pounds six penny; flooring, twenty to twenty-five pounds eight penny nails; shingling, four pounds per thousand shingles. I. P. HICKS.

Side Cut of the Jack

We have before us three inquiries of how to obtain the side cut of the jack with the aid of the steel square. Without mentioning names we will answer all at once.

The question may seem very simple to the majority of the readers and it is as far as the square cornered building is concerned, but very few understand the true principle involved. We dare say most every one would say without hesitation, "Take its run and length on the members of the steel square and cut on length or they may say take the run and length of the common rafter which gives the same result and gives it correctly, provided the sides of the roof are



of the same pitch and the corner is at right angles, but as a matter of fact the run has nothing whatever to do with this or any other shaped corner. What then? It is the tangent.

In the right-angled corner with an even pitched roof, the seat of the hip or valley rests at an angle of 45 degrees from the plates and being at the half way place the run is equal the tangent and for that reason the run has been given the credit which rightfully belongs to the tangents. Practically all of the books on the subject of framing with the aid of the steel square that have come under our notice make this fatal error and those that do not, fail to give the cause and effect. We say fatal because the would-be learner is thrown off of the track and his further progress beyond the ordinary hip roof with such teachings is effectually blocked.

The general rule is, take the length from the corner of the plate to the seat of the jack (which is the same as the tangent) to scale on one member of the steel square and the length of the jack on the other. Cut on the length. The illustration shows the parts to take on the square. This rule applies to any kind of a corner or pitch. If one side is steeper than the other, then the respective sides must be treated in like manner, but separately. A. W. WOODS.

Kerfing a Riser

To the Editor: New Oxford, Pa.

Will you please tell me how to get the distance between and depth of kerf, to kerf a riser for the first step of a stairway; also how much must be kerfed to bend the riser the required slope? G. H. ROTH.

Answer: In Fig. 1. the distance AD the outside of the riser is longer than BC the inside. When kerfing, enough must be taken from the inside to take up this difference in the lengths. There must be no binding or it is apt to strain

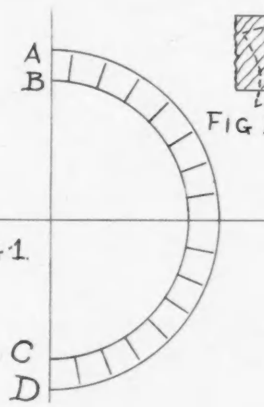


FIG 1.

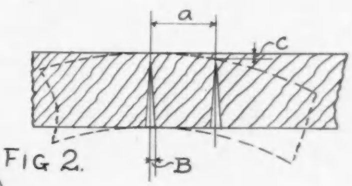


FIG 2.

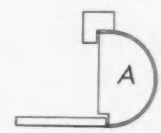


FIG 3

the fibers in the face of the wood, and if too much is taken out in kerfing the curved part of the riser will be weak. When the distance between the kerfs is two or three inches a V shaped cut must be made, but it is better however to have the kerfs closer or they show on the face. No rule can be given that will cover all cases as the spacing of the kerfing depends upon the kind of wood and also upon the thickness of the stuff. The workman must depend largely upon his own judgment for the different cases as they come up. A fairly good ratio between the radius of the curve and the distance between the kerfs is 1 to 8, that is the spacing of the kerfing about one-eighth of the radius, not over that and less if possible. In Fig. 2. A is the distance between the kerfs and B should equal C. If it is desired to do the kerfing with one saw cut then by taking C equal to about half the width of the cut of the saw, the distance between the kerfs is approximately determined. When the radius is small it is advisable to do away with the kerfing in the manner shown in Fig. 3. A is a solid block or one built up and cut to fit the curve. The riser, where the curve begins, is cut down to about three-sixteenths of an inch and glued to the block A which is fastened to the floor. LEWIS R. STEINBERG.

Making Hollow Building Blocks

To the Editor: Hart, Mich.

Would cement poured in moulding sand the same as you pour iron in casting make good hollow building blocks, or would there be danger of damp walls? I heard that it would make them stronger and more moisture resisting, but would like your advice. HERBERT C. HARTWELL.

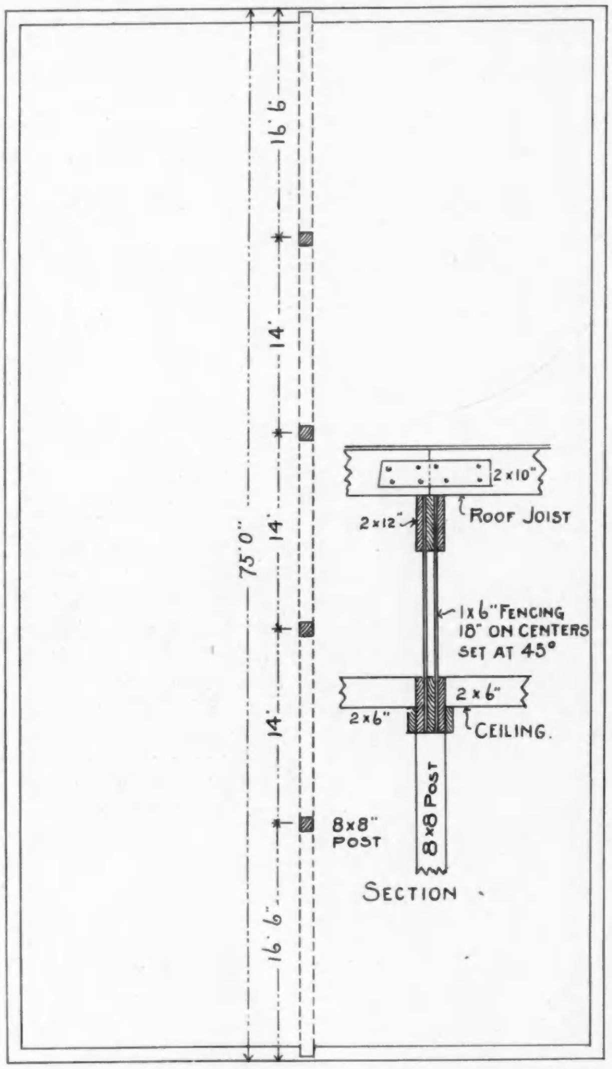
Answer: To make concrete blocks in moulding sand same as casting iron has advantages and disadvantages. The Stevens system, sometimes known as the litholite process, is made in this way, but fine crushed sand is better than moulding sand, as the latter will prevent proper seasoning. Its color is bad, as a proportion of the moulding sand always adheres to the stone. In making stone by pouring, the mixture must be mixed continuously and rapidly to prevent settling of the heavier particles to the bottom, which would not make a uniform stone. Poured stone is more damp proof than dry tamped stone for a period only, but in two to three years the dry tamped stone will excel, while in strength it excels dry tamped stone only for a period of about six months, assuming that both have been properly made. FRED W. HAGLOCH.

Supporting a Ceiling

Equality, Ill.

To the Editor:

A patron of mine wishes to build a one-story store building forty-three by seventy-five feet, all in one room. Ceiling joist will be two by twelve, using ten by ten or twelve by twelve pine



columns made of two by ten or two by twelve pine. Will they be of sufficient strength, and how far apart should they be to support the ceiling joist and roof through the center? The outer walls will be of brick, roof of iron. J. H. GODFREY.

Answer: We will answer the above by submitting a floor plan showing the arrangement of the posts and girder. For the latter we recommend building a lattice truss girder made by two by twelve-inch joists, as shown in the section. The lattice to be of fencing plank set on eighteen-inch centers and at an angle of forty-five degrees. The upper chord to have a fall or pitch of not less than five-eighths of an inch to the foot. On the sides of the lower chord a two by six is spiked to receive the ends of the ceiling joists. For the roof joists we show two by ten, which set on twenty-four-inch centers will be sufficient for a span of this width. We would recommend using eight by eight dressed yellow pine for the posts. A. W. WOODS.

Nailing to Concrete Blocks

To the Editor: Farragut, Iowa.

When nailing in cement blocks, would it be mechanical and good work to nail in the blocks, or should there be wood blocks and strips put in the wall? J. G. SMITH.

Answer: Cement blocks made with wood blocks moulded on the interior side are successfully used to nail interior finishing, but I favor the use of granulated furnace slag instead of sand in making that part of the block to which you wish to nail to. FRED W. HAGLOCH.

Concrete Blocks for Foundation

To the Editor: Staatsburg, N. Y.

I would like to know if hollow concrete blocks below ground make a good foundation for a frame building. Is a block eight by eight by twenty large enough? Is crushed stone from three-quarters to one inch in size too large to put in blocks of that size, and in what proportion would you put them? Building is twenty-two by thirty. WM. BRANGAN.

Answer: Hollow concrete blocks make an ideal foundation wall, and for basements less than twelve feet in height a wall eight inches thick is sufficient for supporting a two story frame building. Size of blocks is a matter of taste, but proportion deals with strength, viz.: no block should be longer than four times its height or less length than one and one-half times its

Send Your Name Today For This New Book

It's FREE

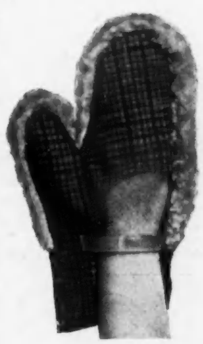
See Our Free Polishing Mitt Offer Below

Enlarged edition, beautifully illustrated from life

A recognized authority on wood-finishing.

It will really pay you to get this book before you finish or refinish any more wood.

This new book "The Proper Treatment for Floors, Woodwork and Furniture" will give you more good practical ideas for your business than you could ordinarily get in a year's time. It will correctly answer the important and often perplexing question: How can I best finish floors, woodwork and furniture and keep them in perfect condition? Other similar questions are answered, too—some probably you do not now think of. Simple directions are given to economically produce all the latest finishes in oak, ash, birch, maple and pine. Explains how pine can be finished almost as beautifully as hard wood. Tells when and how to use dyes, paste wood filler, crack filler, paint and varnish remover, etc. This information is the result of over 23 years in the wood-finishing business. This book is sent **free** by the manufacturers of



JOHNSON'S PREPARED WAX

"A Complete Finish and Polish for all Wood"

It produces a distinctive, lasting and artistic finish to which dirt and dust will not adhere. It does not crack or peel off. Heel marks and scratches will not show. Johnson's Wax contains more polishing wax than any other. That is one reason why it covers the most surface (one pound covers 500 square feet), gives the best, most lasting and artistic finish with the least effort. Try it and see.

Free Polishing Mitt Offer. We would like you to use our new mitt when polishing with Johnson's Prepared Wax, and will send you one **free** (prepaid) if you will send us a label from a one-pound can, or larger, of Johnson's Wax. To remove label place can in steam or water.

SPECIAL. We are large manufacturers of ornamental hardwood floors and will be pleased to send you upon request our free catalogue, showing many beautiful and new designs. Hardwood floors are far ahead of other floors—they are sanitary, durable, attractive and in demand. Don't delay—write us today. We carry a large stock and can ship promptly, anywhere.

Johnson's Prepared Wax is sold by all dealers in paint. ½-lb. can, 30 cents; 1 and 2-lb. cans, 60 cents per pound; 4, 5 and 8-lb. cans, 50 cents per pound. If your dealer will not supply you, send us his name and 60 cents (stamps or silver) and we will ship you prepaid a pound can of Johnson's Prepared Wax, and include one Johnson's Polishing Mitt and the book illustrated above—both free. Or, if you prefer, simply write and get the book absolutely free—but don't forget the label. Ask for edition A C B 8 and send today.

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

"The Wood-Finishing Authorities."

height. I always favor the blocks that are two to three times as long as high, the following being my standard: Six inches high by sixteen inches long; eight inches high by twenty-four inches long; nine inches high by twenty-four to thirty-two inches long; twelve inches high by thirty-six inches long. Crushed stone that pass a three-fourth or inch ring are good for strength, but make a rough appearing stone. The best proportion is cement one part, sand three and one-half parts and crushed stone one and one-half parts.

FRED W. HAGLOCH.

Preventing Mould on Artificial Stone

To the Editor: Laingsburg, Mich.

Can you enlighten me as to the cause of artificial stone turning white and looking mouldy on the outside? I have the blocks all ready to build a model cottage, and they are doing this. I have been told that it is because I built my blocks in a face down machine and faced the blocks with half an inch of one to two cement and sand, to get a smooth and watertight surface. If this is wrong kindly let me know.

WM. H. BENSON.

Answer: Artificial stone will discolor or become spotted with mold (efflorescence) from various reasons, viz.: uneven moistening, too much lime in the cement, too much sunlight and air drafts in drying. This can be removed with a wash consisting of one part muriatic acid, twenty parts wheat flour and sufficient water to make a good paste. Apply with a whitewash brush and remove next day with cold water and brush. Facing blocks with one part good Portland cement and two parts sand is very acceptable, but the process of making stone has much influence on the durability and appearance of the product. FRED W. HAGLOCH.

Preventing Dampness

To the Editor: Malberry, Ind.

I am about to frame a barn, and to do away with a wall one inside post would set on a concrete pillar; the floors of barn are to be made of concrete and the post would set a little below level of floor. Would there be any danger of post drawing dampness? Would like a little information on such work. WM. W. LEHR.

Answer: Little danger of post drawing dampness, but to be safe cover concrete pier after it is hard and dry with a heavy coat of a mixture of one part Portland cement (dry), one part white lead (dry) and three parts coal tar; mix well and apply with heavy brush. This mixture is superior to tar paper for many purposes, but usually more expensive. Both wood and concrete water troughs coated on the inside with it have held without decay or leak for the past five years to my certain knowledge. FRED W. HAGLOCH.

Draining Concrete Floor

To the Editor: Sutallee, Georgia.

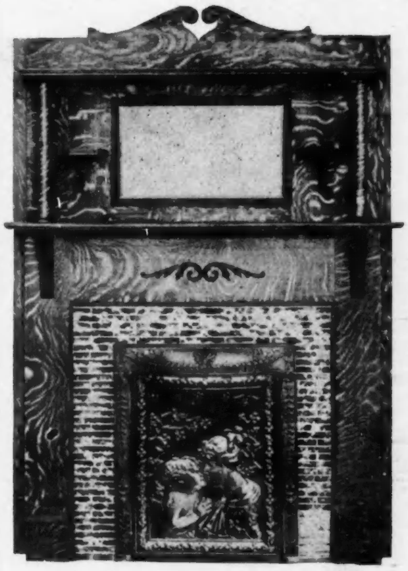
I want to build a store house twenty by fifty feet, as near fire proof as possible, on firm dry red clay. Can I put concrete or cement on this clay for a floor and would it be durable? I have plenty small flint rocks. Which would be cheapest, concrete or brick walls? Which is best and most durable? Could I use metal joist and cover?

JAMES MAYHUGH, M. D.

Answer: A concrete floor made in plates not exceeding twenty-eight square feet each and four inches thick will be sufficient, unless your location is subject to water, then you must provide drain to prevent frost. Draining concrete can best be done by first making a footing of gravel, broken stone or brick bats to a depth of six inches, with sufficient slope to a drainage point and tile from there to sewer.

FRED W. HAGLOCH.

A BARGAIN



Oak Mantel, handsomely figured with veneered quartered oak columns, beveled *plate* mirror, polished and rubbed finish, tile facing (slabbed) and steel summer front, delivered anywhere.

$18.00

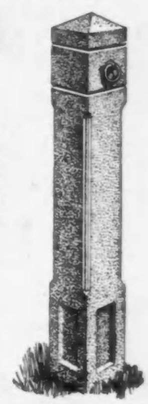
Other designs and woods at equally low prices.

We carry a stock of over 200 mantels in 50 designs, in all kinds of woods.

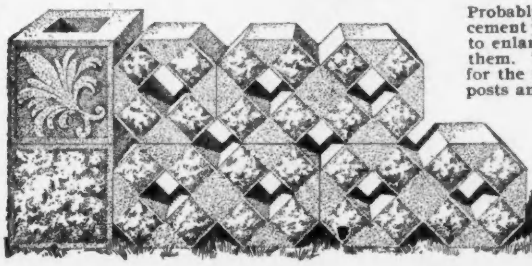
Send *to-day* for our 40 page Catalogue.

Address, *Department "M"* **THE A. W. BURRITT CO.,**
"The Mantel Folks,"
349-473 Knowlton Street, BRIDGEPORT, CONN.

THE CROUCH SYSTEM



THE SAND PALLET BEATS THEM ALL



Probably 10,000 persons contemplate engaging in the manufacture of cement posts or cement building blocks this year. Many more propose to enlarge their plants or perfect their equipment. You are one of them. The **cost** is an item of importance. Before buying a machine for the manufacture of cement building blocks, porch blocks, fence posts and hitching posts, write for my new catalog and learn about the **Sand Pallet** and the **economical** system of making them.

By using the **Sand Pallet** you cut out the cost of wooden or metal pallets. This item alone will save you $200 to $500 on a small outfit to make 150 blocks per day. This amount is more than I ask for an outfit to make 25 varieties and sizes of stone, posts, lattice and piers. Besides this, the other kind of machine costs more than mine. You will be **right** when you adopt the Crouch System.

J. M. KEITH, 1190 West 4th Street, Des Moines, Iowa.

Solid Steel Body

The Furnace for the Builder

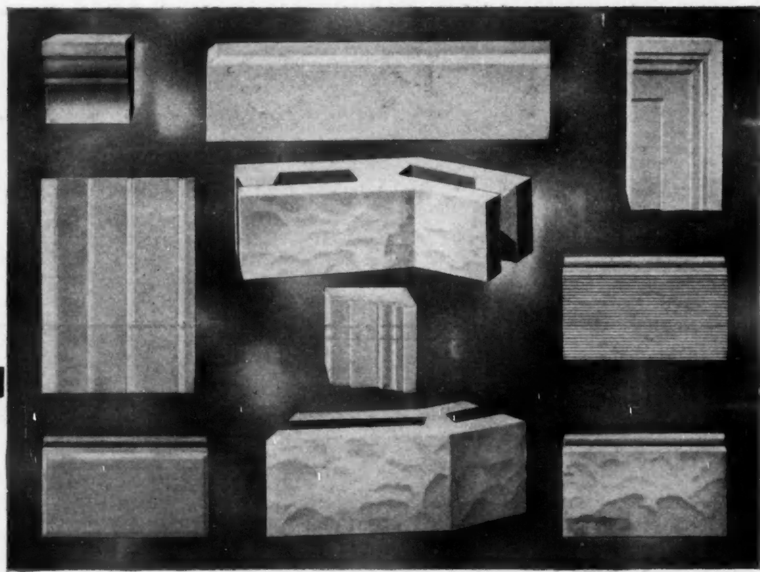
Because of its simplicity, its scientific heating principles and its success. Because it is as easy to set as a stove.
The pioneer of all steel furnaces—riveted like a boiler, dust tight and gas proof. No packed joints or cracked fire pots to leak gas into the air chamber. Being of steel it radiates heat quickly and the indirect radiator doubles its radiating capacity. Investigate the

LENNOX TORRID ZONE FURNACES

and send for a 40 page illustrated catalog and submit pencil sketch of plans for an estimate from our heating engineer. **TORRID ZONE** hot air furnaces are now sold from Pittsburg to Denver and from Canada to Texas. We sell direct to the contractor or consumer where we do not have agencies established.

THE LENNOX FURNACE COMPANY, Marshalltown, Iowa

Sectional View



Cement Blocks Made With a Battjes Machine

NINE TIMES IN TEN the waiting game is a losing one—*GO IN TO WIN*—repairs cost money. Cut out the repairs.

A BATTJES CEMENT BLOCK MACHINE will turn out more cement blocks in a year at a less cost for repairs than any machine on the market today.

You can test it for speed, test it for simplicity, test it for durability, and you can do it at our expense.

More information for a postal, you'll find it in the "Corner Stone," a book of valuable information on cement block construction.

The BATTJES BUILDING MATERIAL CO. GRAND RAPIDS MICHIGAN

THIS MANTEL $24.00

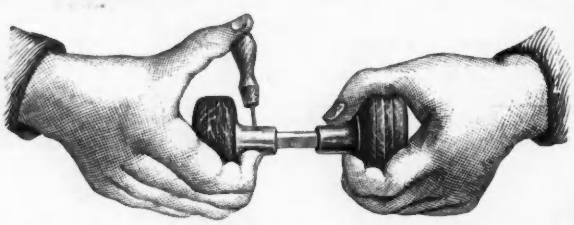
Golden Oak, 82 inches high, 5 feet wide. Includes enamel tile hearth and facing, 20-inch oxydized finish combination grate with summer front.

Catalogue E Free—Mantels $20.00 up. Our handsome large 72 page Catalogue for 10c postage

CALHOUN MANTEL & TILE CO.
KANSAS CITY, MO.

Tile Floors
AND
Bath Rooms

Send Sketch of Space for Prices



ROBERT'S SCREWLESS SPINDLE DOOR KNOB

Strength (tested to 400 lbs.) No Screw or Washer. Self adjusting. Fits any thickness of door. Any Standard Escutcheon. No tool required, an Awl or Small Wire Nail will answer. A Great Labor and Time Saver, at a Price of the Ordinary Capped Shank Knob. Every Knob Guaranteed. It cannot work loose.

MANUFACTURED BY
LAANNA MANUFACTURING CO.
Factory, Laanna, Pa. Office, 3614 HOWELL ST., PHILADELPHIA, PA.

SLATE WE HAVE WHAT YOU WANT

In Roofing Slate, Slate Blackboards
Structural and Plumbers' Slate

SATISFACTION GUARANTEED IN QUALITY AND PRICE

ASK FOR DELIVERED PRICES

J. K. HOWER, Station C., **Slatington, Pa.**
H. J. KICHLINE, Sales Agent

PATENTS Valuable and Salable Patents Promptly Secured. Advice as to Patentability and Commercial Value Free. :: :: Write for Inventor's Hand Book.

Shepherd & Parker, Patent Lawyers

"During the past ten years Mr. Shepherd, of Shepherd & Parker, has obtained for us a great many important patents. We have no hesitation in heartily recommending him to any one having need of the services of a patent attorney. HALLWOOD CASH REGISTER CO.

Mr. Parker on Nov. 1, 1903, resigned his position as an examiner in the U. S. Patent Office to enter this firm. Address, Dietz Bldg., WASHINGTON, D. C.

SLATE! SLATE!! SLATE!!!

Black Boards for Schools - - - - Roofing Slate for Houses

Are you going to build a home? I trust you are, and that you will put on it for a Roof (one of the most important things about a house) **SLATE**, which is always CLEAN, FIREPROOF and BEAUTIFUL. Write for prices, and I will tell you all about **SLATE.**

DAVID McKENNA, SLATINGTON, PA.

HERE IT IS AT LAST!

WHAT?

The Coryell Cement Block Machine

The only machine in the world that will make a block that will build an absolutely hollow wall. We guarantee the machine, and guarantee your walls to be damp, frost, and fire proof. Let us tell you about it in our catalogue, which can be had for the asking.

Write, The Kells Foundry & Machine Co.

82 N. Main Street : : : : : ADRIAN, MICH.

WHO MANUFACTURE AND SELL THE MACHINE

CEMENT BRICK

BE YOUR OWN BRICK MAKER

LARGE CAPACITY — 5,000 BRICK PER DAY

SKILLED LABOR UNNECESSARY. SIMPLE AND INEXPENSIVE

Seaman's Cement Brick Machine Co.

23 Fountain Street . . . . Grand Rapids, Michigan

WAGNER No. 40 ROOF BRACKET

Patent Applied For

CAN BE USED FOR BOTH SHEATHING AND SHINGLING

It has the Safety Hook

Write for Circular

WAGNER MFG. CO., Cedar Falls, Iowa.

Portable Steel Frame Buildings

For Summer Cottages, Galleries, Churches, Stores, School Houses, Shops, etc. Made in any size with steel frames, sheet-iron roofs, sheet-iron or wood sidings, single or double walls. Light, strong, substantial and weather-proof. Can be moved repeatedly with ease and without injury.

Write for full information and prices

THE LLOYD IRON ROOFING & PAINT CO.

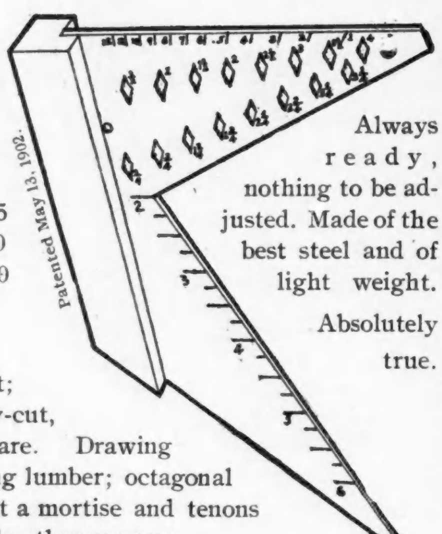
100 West Monroe Street CHICAGO, ILLINOIS

Are You Going to Build?

New Universal Square

Made in three sizes

No.	Inches	
1	6	$0.65
2	10	1.00
3	13	1.50



Always ready, nothing to be adjusted. Made of the best steel and of light weight.

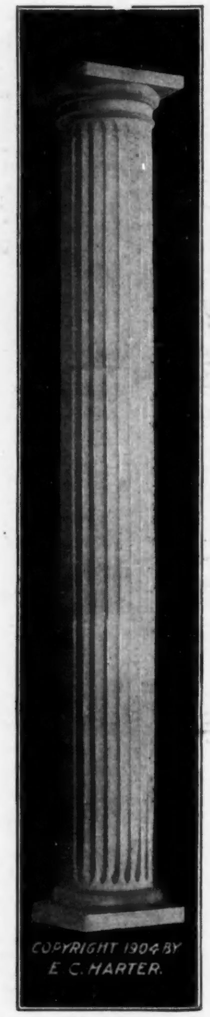
Absolutely true.

Combination Tri; Pitch-cut; Hip and Valley-cut, and Mitre Square. Drawing circles; gauging lumber; octagonal cuts; laying out a mortise and tenons and innumerable other purposes.

For sale at all first class tool dealers.

The Duby & Shinn Mfg. Company, (Inc.)
19 PARK PLACE,
Nelson Building NEW YORK CITY

THE FACE PLATES



of our $25.00 concrete Stone Outfit are all interchangeable. The stone made by it are just as artistic of design and as practical for building buildings as those made on the more expensive machines. We ship to responsible parties on ten days' trial. 411 machines shipped on trial during 1904; only three were returned. If we were selling gold dollars for 90 cents each we could scarcely hope to beat this record. Don't argue—we pay the freight when not satisfactory. Send for our book of instructions for making concrete stone.

CEMENT WORKING MACHINERY CO.

195 LA FAYETTE AVE., DETROIT, MICH.

The R. B. Coltrin Hand Power Mixer

PATENTED FEBRUARY 21, 1905

Van Wert, O.,

June 5, 1905.

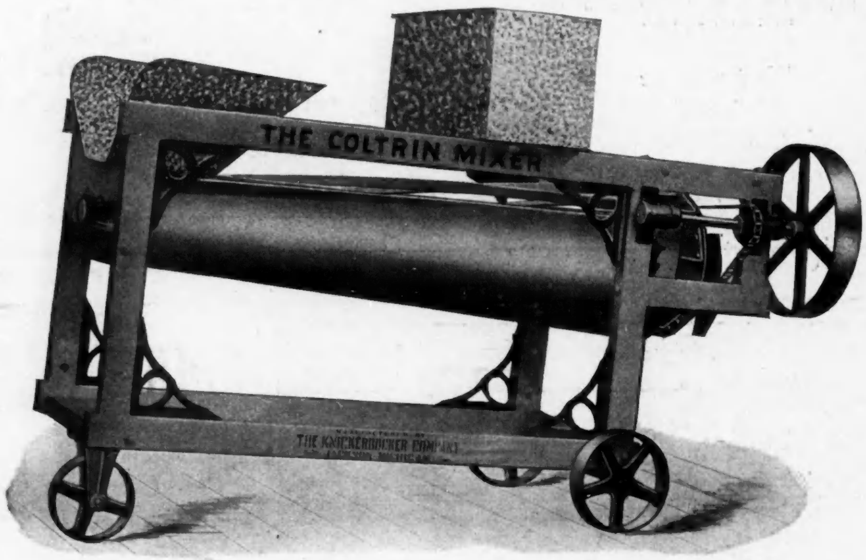
The Knickerbocker Co.,

Jackson, Mich.

Gentlemen:—I started your machine to work a day or two ago, and I find the Mixer is just what I want. Enclosed please find draft for it in full.

Yours very truly,

J. G. Farnam.



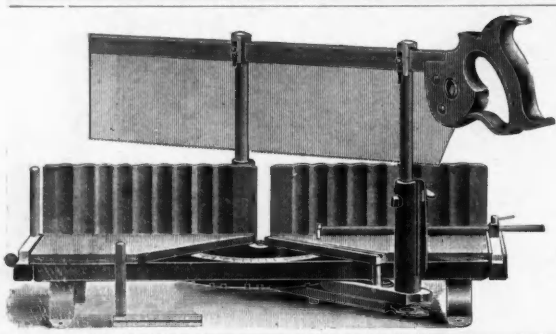
Manufactured Exclusively By

The Knickerbocker Company, Jackson, Michigan

Liberty Street, Near Union Depot

Catalogue No. 2 is now ready and will be mailed on application

Investigation Solicited



GOODELL MITRE BOX

MADE ENTIRELY OF STEEL.

No more breaking. Our Automatic Stops for holding up saw are the simplest, quickest acting and by far the most convenient, the saw being released by simply pressing down on it.

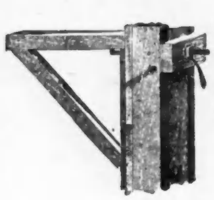
Backs corrugated, allowing clearance for sawdust. Graduated. Gauge for duplicate cuts. Many improvements.

Quality ahead and entirely in a class by itself, and the carpenter that once sees it will have no other.

SEND FOR CIRCULAR O AND PRICES.

GOODELL MFG. CO., Greenfield, Mass.

Scaffold Bolts

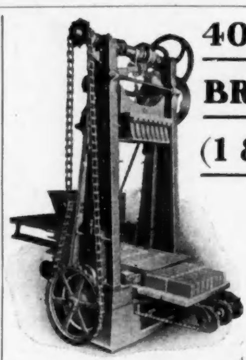


also Structural Bolts, all kinds. Rods, Double and Single Timber Stirrups, Cast Washers, Plates, Turn Buckles, Lag Screws.

Address

Rockford Bolt Works

No. 20 Mill St. ROCKFORD, ILL.



40,000 SAND-CEMENT BRICK or 5,000 BLOCK (18 x 24) PER DAY

Only TAMPING principle power machine made.

We also make an up-to-date mixer.

Write for Catalogue.

CONCRETE MACHINERY CO.

950 Majestic Building, DETROIT, MICH.

We Wish to Get into Correspondence With Every Person Who Reads this Ad.

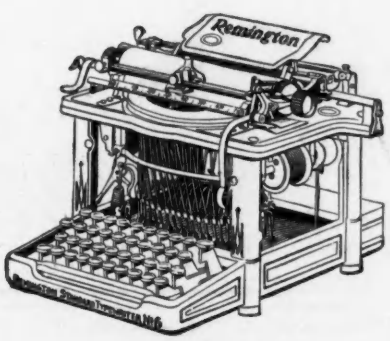
We Manufacture the INTROSTILE The only perfect door bottom appliance known to the building trade. It completely does away with thresholds, closes aperture underneath doors, and does not alter the appearance of the door a particle. You should know about it. Write for Catalogue A. **THE INTROSTILE & NOVELTY CO., Marietta, Ohio**

The PROOF of Remington Supremacy:

It outsells every other Typewriter

The REASON for Remington Supremacy:

It outworks and ❦ ❦ ❦ outwears every other Typewriter

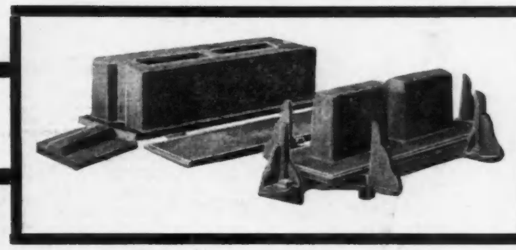


Remington

Typewriter Company

New York and Everywhere

Concrete Blocks! The Clipper Block Machine Produces Them



The Clipper Block Machines are simple, durable, light, strong, accurate, and will produce a great variety of shapes and sizes in hollow blocks, veneering blocks, chimney blocks, pier blocks, circular blocks.

ALL FACE BLOCKS TAMPED WITH THE FACE DOWN.

Rock faced, plain faced, panel faced.

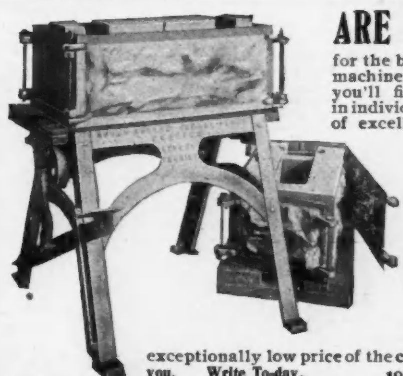
Continuous air space, damp and frost proof.

Machines on the installment plan.

Write for particulars.

THE CLIPPER MACHINE CO.

Address Dept. "A" **Dows, Ia.**



ARE YOU LOOKING

for the best hollow cement stone machine on the market? If you are, you'll find that **our Machine** is in individual and combined points of excellence superior to those costing five times as much. It makes better blocks, more of them and a large variety with one size pallet at 6c for all size blocks. The machine will **pay for itself** at the very start and **save you money** every day in the cost of production. Outfit includes face plates for caps and sills up to 60 inches in length. The exceptionally low price of the complete outfit will **surprise** you. Write To-day.

SUPERIOR CEMENT MACHINERY CO., **183 E. Washington St.**

D. GOODMAN, Mgr. Agents Wanted. **CHICAGO, ILL.**

CARPENTERS

OUR

Self-Setting Planes

Are different from other planes. We can not properly describe them in this space. Suppose you send for circulars, or, better still, send for a plane on 30 days' trial. We will deliver you a Self-Setting Smoothing Plane at any U. S. Postoffice on receipt of three dollars. If you return the plane as sent, within 30 days of receipt, we will at once refund you the $3.00.

GAGE TOOL CO.

Box G. VINELAND, N. J.

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. **228 E. 4th St. WATERLOO, IOWA.**

COMPLETE OUTFIT PRICE **$15.00**
HAND AND FOOT-POWER
MACHINERY

Our No. 7 Scroll Saw is warranted to be made of good material and workmanship, and to saw pine 3 inches thick at the rate of one foot a minute.

Send for Catalogue.

W.F. & Jno. Barnes Co.
74 Ruby St. ROCKFORD, ILL.

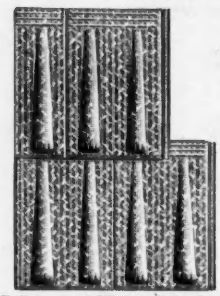
ARTISTIC ROOFING

Endorsed by leading architects.

Storm and Fire Proof.

Can be put on by Carpenters.

Especially adapted for
Residences, Churches, Schools,
And all Buildings with Pitched Roofs.



Galvanized Victor Shingle, Size, 10x14 inches.

Our Galvanized Shingles do not require painting or after care.

Testimonials, Prices and Catalogue showing seven different lesigns, free.

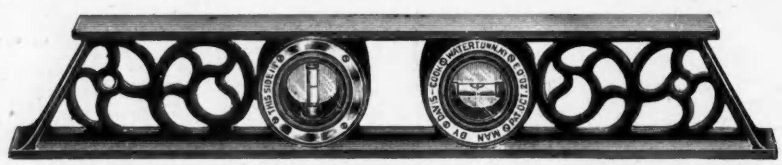
Durable, Medium Weight.

Moderate in Price.

MONTROSS METAL CO., 19 Erie Avenue, CAMDEN, N. J.

GOOD WORKMEN MUST HAVE GOOD TOOLS

Start Right.
See that your kit contains a



WOOD
IRON
Aluminum

COOK'S PATENT LEVEL
FOR CARPENTERS, MACHINISTS, MASONS. EVERY LEVEL WARRANTED

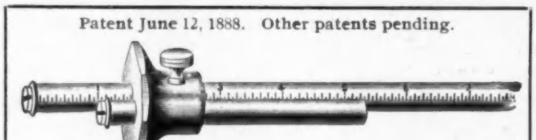
DAVIS & COOK
13 High Street WATERTOWN, N. Y.

OF ALL DEALERS, OR CATALOGUE ON REQUEST

ALL CARPENTERS RECOGNIZE THE ADVANTAGES OF

Barrett's Improved Combination Roller Gauge

Patent June 12, 1888. Other patents pending.



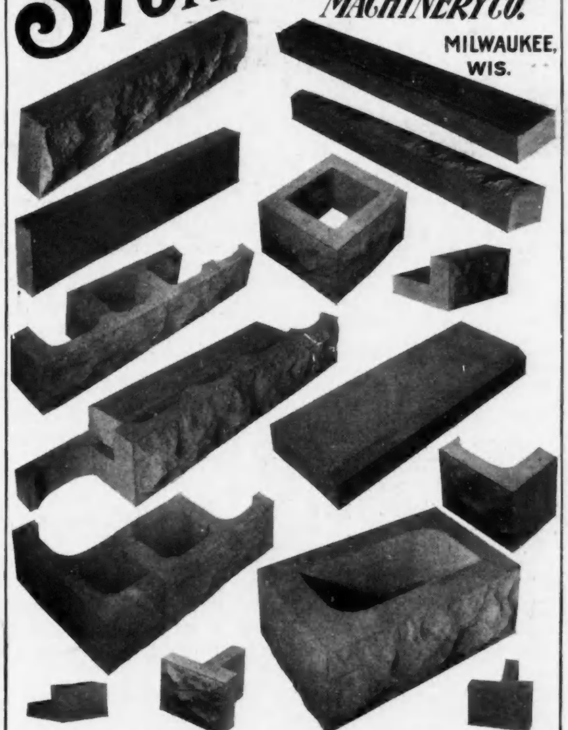
over all others. It is quickly adjusted with only one screw direct from the center, fastening both beams in their proper place. A simple device holds the beams in position while being adjusted. Accurately made and finely finished. Insist upon having the improved style adjusted by one screw.

The Leavitt Machine Company
Sole Manufacturers *Orange, Mass., U. S. A.*

CONCRETE STONE

MADE BY NATIONAL BUILDING BLOCK MACHINERY CO.

MILWAUKEE, WIS.

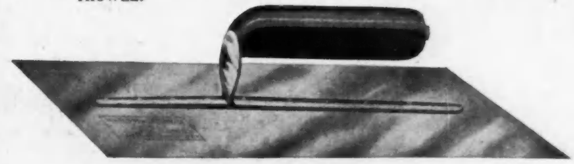


211 GRAND AVE., MILWAUKEE, WIS.

BEST MADE

GENUINE MARSHALLTOWN TROWEL.

Plasterer's Mitering Trowels, Aluminum Hawks and Darbies, Hand-Forged Brick Hammers and Brick Layer's Scutch. Beading Tools for Stone Range and Cement Block Work.



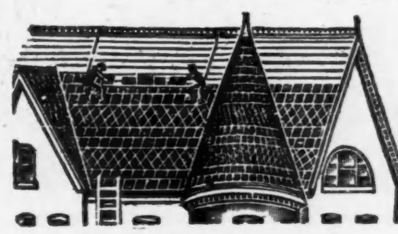
Catalogue on Plasterer's Tools.

Marshalltown Trowel Works

801 East Church St., Marshalltown, Iowa.

SLATE SLATE

GENUINE BANGOR



Roofing

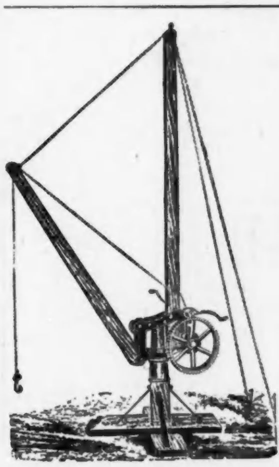
Blackboards

Structural

Write us before ordering elsewhere.

The Bangor Slate Co.

Miners and Mfgrs. BANGOR, PA.



DERRICKS

of all descriptions, for all purposes, from . . $35 up

Special derricks for handling

Cement Hollow Blocks

The finest derrick for this purpose made.

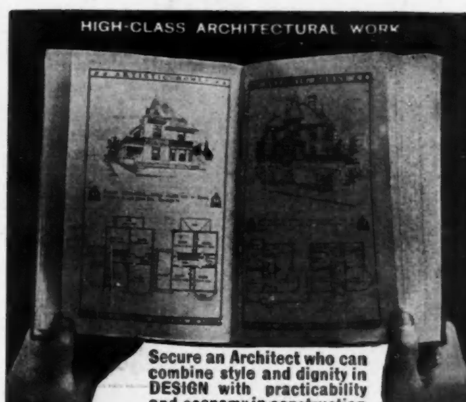
MATERIAL ELEVATORS

Chains, Sheaves, Tackle Blocks and Rope

Write for catalog and prices.

NATIONAL HOIST & MACHINE CO.

460 W. 22d St., CHICAGO, ILL.



ARTISTIC HOMES

This handsome 1905 Edition-de-Lux will be sent for $1.00, post-paid. It is the largest and best-printed book of moderate-cost house plans

—PUBLIC BUILDINGS—

NOTE.—If you take an interest in "A City Beautiful" send me full particulars of any important buildings which are to be built in your city in the near future.

I have designed churches, schools, libraries, theatres, stores, hotels, banks, etc., all over the U.S., and have a special department for the planning of residences. Book of 32 Churches, 25c.

HERBERT C. CHIVERS

216 N. 7th —CONSULTING— St. Louis

ARCHITECT

CUSTOM MADE FLY SCREENS

Our work is far superior to the usual output of local mills and has a style and finish not obtainable from those who do not make a specialty of screens.

For outside screens we use the identical finish of the outside of Pullman cars.

The best grades of Wire Cloth, enameled, galvanized, genuine bronze, etc. Fastened by tacks or by the "lock-strip" process.

Intending purchasers may have free by mail samples of woods, finishes and wire cloth and copy of catalog and price list. Agencies in many cities. Special terms to contractors and builders.

THE A. J. PHILLIPS CO. Fenton, Mich.

23 Years Experience. 3 1-2 Acres of Floors.

CONTENTS FOR AUGUST, 1905

INDEX TO ADVERTISEMENTS, AUGUST, 1905

We Guarantee the Reliability of Our Advertisers

None but reliable advertisers will be admitted to the columns of THE AMERICAN CARPENTER AND BUILDER.

We will not knowingly accept advertising from firms which will not give full value to our subscribers.

Great care is exercised in investigating the standing of all firms whose announcements are admitted to our pages, and no questionable advertising will be accepted.

If you fail to get from an advertiser what you were led to believe you would get by his advertisement, write us about it and we will see that he does as he agreed to do.

If we find that our confidence in an advertiser has been misplaced, we will do all in our power to rectify matters.

American Carpenter and Builder

THE NEW HERO

IS THE BEST FOR

COUNTRY RESIDENCES
LARGE BUILDINGS
and
COMBINATION
HEATING

All Cast Iron

Portable or Brick Set. Four Sizes.

OUR WATER ATTACHMENTS CAN BE USED IN ANY FURNACE

SPECIAL CATALOG

Warm Air Only, or **Combination of Warm Air and Water.**
It has a **DEEP ASH PIT with TRIANGULAR GRATE BARS, that have no Cog Wheels or Bolts.**
The **DEEP CORRUGATIONS of FIRE POT and DOME** increase the radiating surface fifty per cent, and double the strength of the casting.
The LARGE FEED DOORS are a great convenience.
The DOME and RADIATOR are each made in one piece. They cannot leak gas.
This is not a cheaply constructed furnace. It can't be made better. Will last a life time.
Send us your plans and we will tell you what it will cost to heat your building by the most approved method.

Chas. Smith Company, Manufacturers

40 Dearborn Street, CHICAGO

FREE—Complete Specifications for House Painting

covering outside and inside painting, new and old work, each on a separate sheet.

These specifications are thoroughly up-to-date, practical and accurate in every detail. They have been prepared with the co-operation of leading painters in each of our great cities and are perhaps the most satisfactory specifications of the kind available. Every architect, builder and painter should have a copy. Carefully followed they insure satisfactory results.

Sent free of charge, upon request, from any of our branches. . . . Be sure to mention this paper.

NATIONAL LEAD COMPANY

(Largest Makers of White Lead in the World)

NEW YORK BOSTON BUFFALO CLEVELAND CINCINNATI CHICAGO ST. LOUIS
PHILADELPHIA (John T. Lewis & Bros. Co.) PITTSBURGH (National Lead & Oil Co.)