AMERICAN CARPENTER AND BUILDER

WASHINGTON'S HOME AT MT. VERNON

JULY, 1905 Price 20 cents

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. JULY, 1905. No. 4.

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.

A MAN can find ideas between the handles of a wheelbarrow as well as between the pages of a book, but the inspiration to look for them is not so strong.

A CHANGE is sometimes essential to a workman bettering his condition, but there is a big difference between making a change and getting the job-changing habit.

THE man who is allowed to come to work a few minutes late for a time soon falls into the habit of being late, and becomes a demoralizing force for the other employes.

EVERY man should take an interest in the work in which he is engaged. It is utterly impossible for a man to do good and honest work unless he does this. The man that drones the whole day through, never caring whether he does it right or wrong, doing only what he is obliged to to keep from being censured by the boss, is always a poor workman, and can never be relied upon when good work is needed. Simply working for work's sake is a poor motive. One must not expect promotion under such conditions.

Architects and Public Affairs

SELDOM do we hear of an architect holding office and very rarely is the name of one mentioned in connection with anything political.

It is not because the members of the profession are not intelligent enough, but rather because, as a rule, they are exclusive. They would greatly help every community if they would give the public the benefit of their knowledge along the line of public improvements and in beautifying their city.

Improve the Streets

THE average man is very apt to think when he buys a piece of property that if he keeps his lot in good condition he has done his duty. This is not so. Let every man, whether he owns a house or rents it, go into the street in front of his home and see whether it is in the same satisfactory condition that he expects in his parlor. In too many towns the dilapidated condition of the streets gives strangers a poor impression of the place, and it is not to be wondered at.

The Farm Bath Room

EVERY farm house should have a bath room. Why city houses are all supplied with bath rooms and farm houses, generally speaking, left without them, is a mystery. The bath room on the farm costs no more than the bath room in the city and the water supply should cost less. The water supply in the average city house probably costs about $8 a year. Eight dollars in the country would pay the interest on the cost of a wind mill or a tank which would supply water not only for the house, but for the stock as well.

A bath room may be had where there is no water pressure, by simply arranging a wash boiler with a

faucet on the back of the kitchen stove with a hose or gas pipe attached to the faucet to lead the water into the bath tub in another room. An improvised bath arranged in this way will pave the way for a better arrangement, because, when once enjoyed no farmer is willing to do without the luxury again.

To Prevent Fires

THE fact that America leads the world in destruction of property by fire is something we cannot be proud of.

Hasty, reckless construction is the chief cause. It is due to this age of breathless haste, when it is the builder's object to complete the work in the shortest possible time. This results in the use of unseasoned wood, which in a few months shrinks and leaves great gaping open spaces, which, together with poorly constructed chimneys, make the buildings a menace to human life.

Another cause is that owners can obtain insurance on these buildings, although at an increased rate. The companies should refuse risks on badly built structures. They should demand a certain quality, and if the structure does not come up to the standard, to refuse the risk at any price.

A Setting That is Wrong

WHEN one is obliged to thread his way gingerly through a drawing room that is filled to the overflow with easels and statues and busts and spindle-legged tables and fragile chairs and obtrusive footstools, in danger every second of stumbling or knocking something over, things are wrong with that setting.

Another mistake is to have too little light. Why darkness and gloom should be sought in any portion of a house where people must live, has always been to me an unsolvable problem. Mysterious corners are in order in a cob-webbed attic or an underground cellar, but they are seriously out of place in a pleasant room into which visitors are ushered, and which is supposed to be a rallying spot for the family.

Light does no harm. Although the strong rays of the sun may somewhat impair the first freshness of upholstery, yet they tone down crudeness of color, and in the end are an improvement.

Importance of Good Plumbing

LAST month we published the first of a series of articles on plumbing, as we feel that good plumbing is one of the most vital factors in completing a house. A poorly constructed sewer connection is as dangerous, if not more so, as a poor flue, because the gases from decayed matter are sure to carry disease and death with them. It is, therefore, important that the carpenter and builder give as much attention to the plumbing system to be installed as they would to the heating apparatus.

In this series of articles the defects of many of the present systems will be shown and the best ways in which they can be remedied. The writer, W. R. Marshall, has had a long experience in the plumbing business, and the articles are the result of many years of labor in experiments and scientific research.

The language, as in all of our other articles, will be simple so it can be understood by all of our readers and the ideas conveyed will be practical so they can be used.

The Noblest Art

EVERY carpenter and builder should be proud of his occupation, as it is his craft that constructs and beautifies the cities, villages and homes. It takes a master mind to plan the wonderful structures which are being erected around us, making them capable of safely housing hundreds and often thousands of people. Do these people ever stop to think of the immensity of the building they occupy, and of the time, labor and ability it must take to create out of nothing the plans for such a housed city. The carpenter and builder, therefore, should feel as did Henry Wadsworth Longfellow, when he said:

"Ah, to build, to build! That is the noblest art of all the arts.
Painting and sculpture are but images,
Are merely shadows cast of outward things
On stone or canvas, having in themselves
No separate existence. Architecture,
Existing in itself, and not in seeming
A something it is not, surpasses them
As substance shadow."

The Living Room

EVERY house has some room which is used to a greater or less extent as the living room. This is the place where the family is accustomed to gather in the evening, where the children do their studying or reading and the parents discuss the things which are of interest to them. In the majority of houses the living room is also used as the library, and if the books are properly arranged on low book shelves it will give the room an air of refinement and culture.

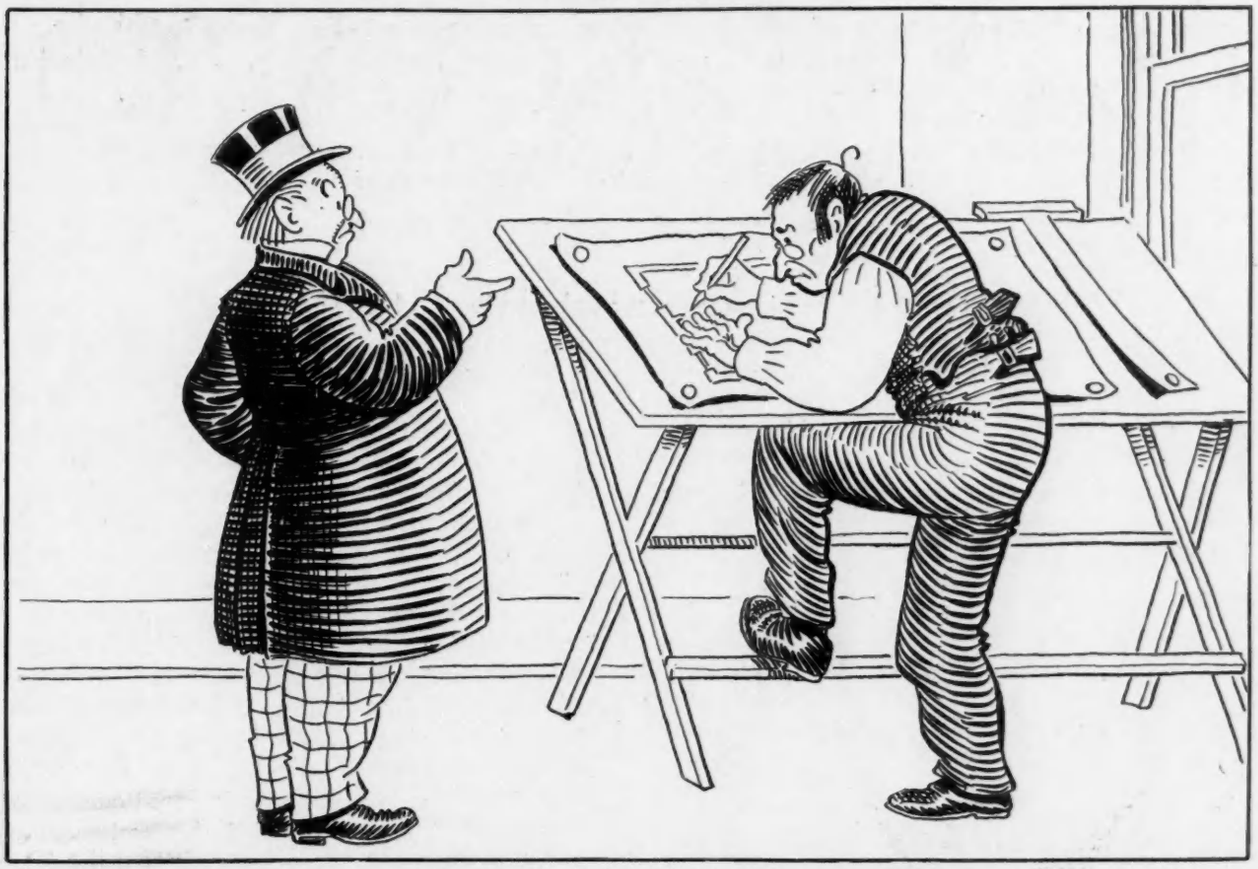
This room should be the largest in the house and have the best outlook, having, if possible, a southern or western exposure. This will make it bright and cheery during the winter when it is mostly used.

If possible, the living room should have a large, open fireplace, built so that logs can be burned.

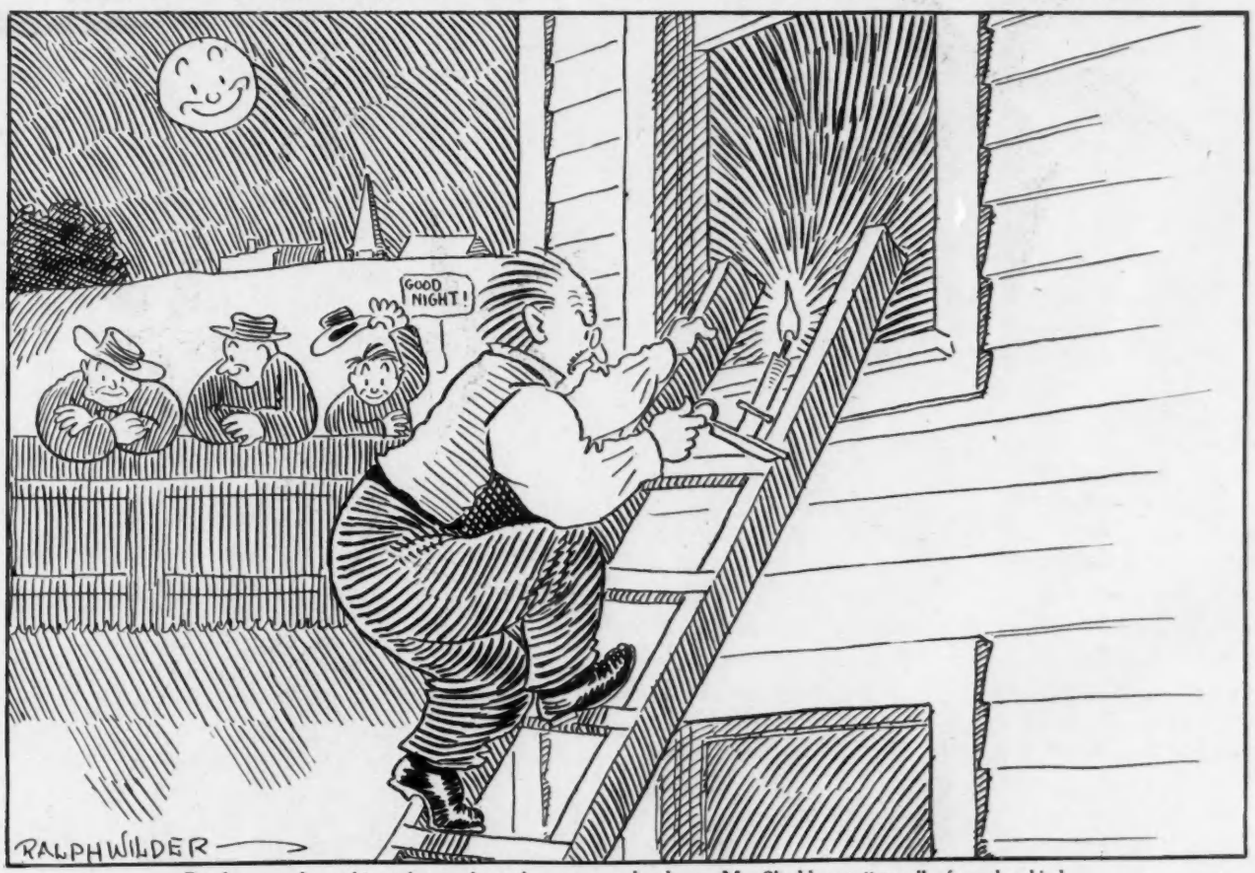
A log fire gives the entire room a cheerful, homelike appearance, and will make it a place that is inviting to all the members of the household.

The small additional expense incurred in fixing up an ideal living room is more than accounted for by the comfort derived therefrom and by keeping the children at home by your own fireside.

MR. SKADDS' STAIRS.



Mr. Skadds: "I want you to pay particular attention to the front stairs—I want a sort of grand staircase—something imposing."



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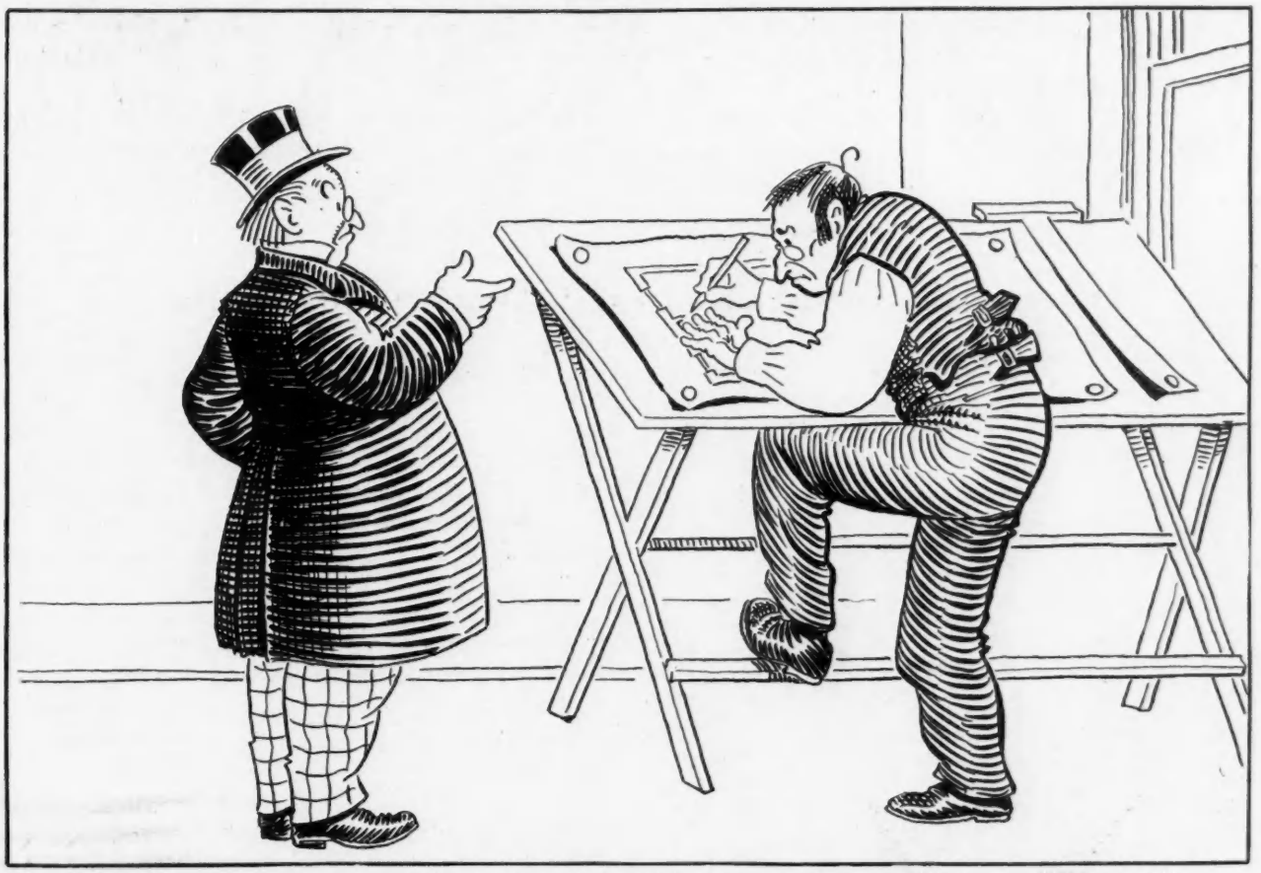


Mr. Skadds: "I want you to pay particular attention to the front stairs—I want a sort of grand staircase—something imposing."

But because the architect forgot about the necessary headroom Mr. Skadds got "stares" of another kind.

STEEL SQUARE

ALFRED W. WOODS

The Steel Square and Its Possibilities

IV. SHOWING HOW TO LAY OUT ANY POINTED STAR AND THE FIGURES TO USE—ALSO HOW THE TANGENTS ARE OBTAINED ON THE STEEL SQUARE FOR ANY ANGLE

IN OUR last article we said we would show other methods of obtaining the five-pointed star with the aid of the steel square, but we wish to impress on the reader's mind that what we say of the five-pointed star is just as applicable to the six, seven,

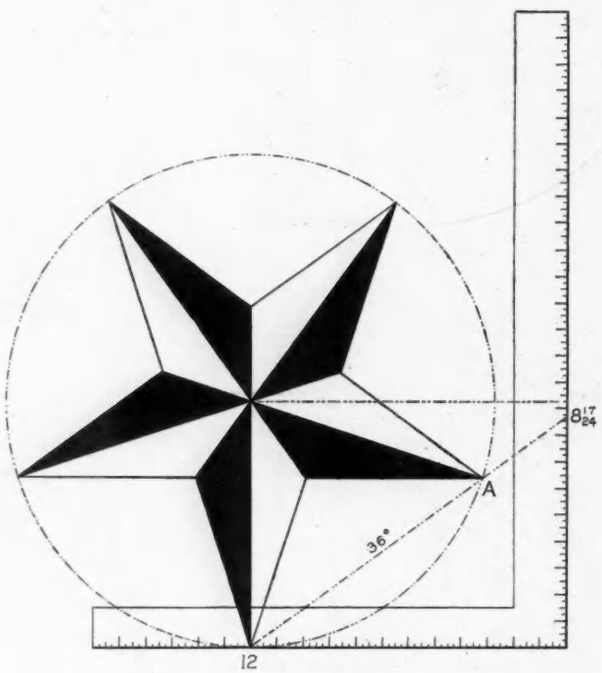


FIG. 16.

eight, nine, or any other pointed star. The figures to use on the steel square may be readily found in Fig. 4 of the May number. However, this only applies to those whose number of points or sides will divide 180 without a remainder.

The heptagon and octagon are among this number. Their quotients are 22½ and 25 5-7, with tangents 4.97 and 5.78 respectively. Their values in common fractions are 4 23-24 and 5 19-24, and are the figures to use on the blade for their miters, the latter giving angle. There is a whole lot of other information to be gained from these proportions, but as we are talking on miters and angles we will confine our remarks to that part for the present.

Our object is to thoroughly cover the subject of miters, angles, etc., before we take up roof work, because the reader will then be better able to grasp the subject. Another point we wish to make is, that we are giving the readers this information, so to speak, on the square. That old square of yours is good enough provided the angle is at 90 degrees and the markings on the outer edge are correct. That is all we use, and it is all that is necessary in connection with that unseen but ever present factor "degrees." The two are inseparable and when their relation to each other is once understood, the things that can be wrought are seemingly unlimited.

We have at present enough work maped out at the rate we are going to cover a period of several months. If we fail to touch on some particular point at the time

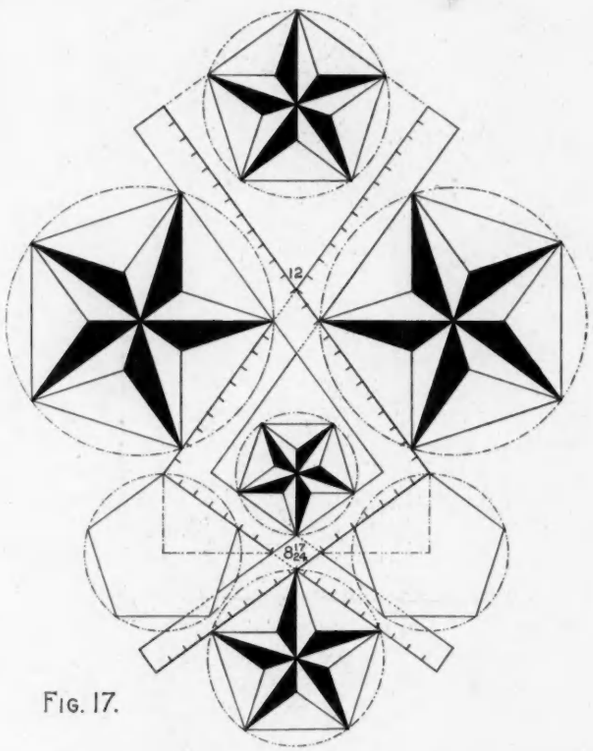


FIG. 17.

that the reader thinks we should, just be a little patient and we will get around to it by and by. We cannot give them all at once, for the same reason that the

will show later on when we get into roof framing.

In all of our work we reckon the degree lines rising from twelve on the tongue and recording the tangents on the blade, as shown in Fig. 4 of the May number.

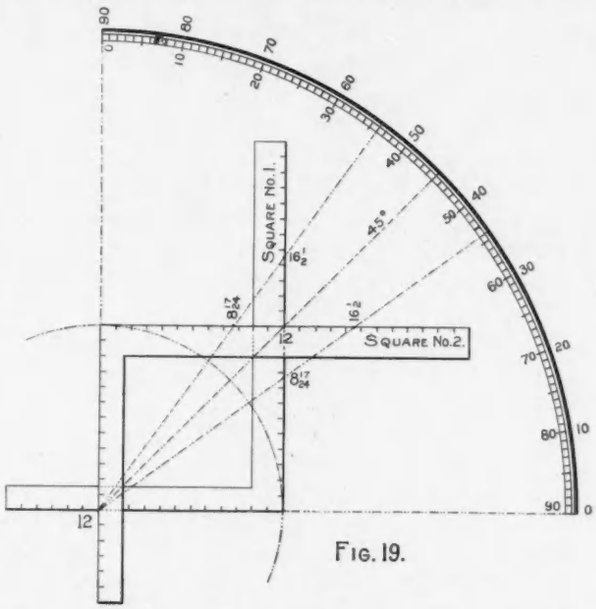


FIG. 19.

The tangents cease at 45 degrees, which is at 12 on the blade. The degree lines above this point are called co-tangents, but since they leave the blade at 63 degrees and 26 minutes, or 26 degrees and 34 minutes from a perpendicular line set at 12 on the tongue, it would require a square with a blade fifty-seven feet,

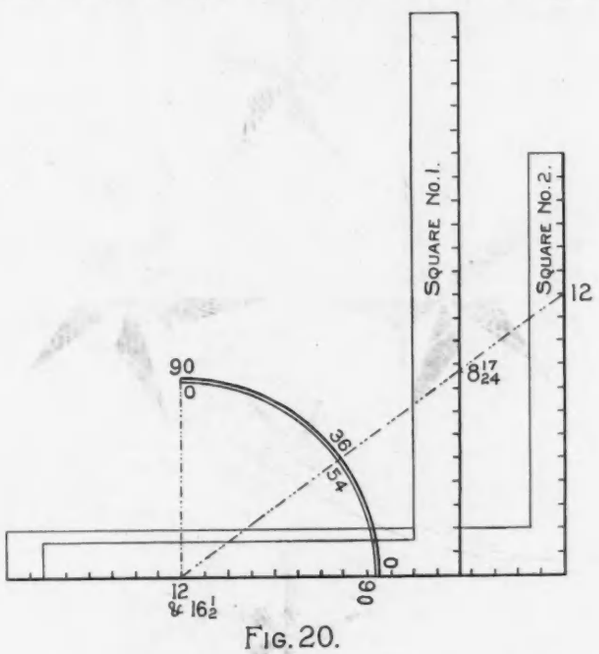


FIG. 20.

three and one-half inches long to catch the 89th degree, and it would still be one degree from perpendicular, and that one degree would run the co-tangent into many hundreds of feet and end in the infinite. The co-tangents on a square, if it could be of such proportions, would give just the same cuts above 12 on the doctor who may carry medicine in his little case for all the ills of mankind cannot give a little of all, at one time, for it would produce a bad effect. So give us time and we will promise the best and that at the proper time.

In Fig. 16 we show the 36 degrees in connection with the square. We wish to make a star with a circumscribed diameter of sixteen and one-half inches. At a point directly above twelve on the tongue we set off the radius, eight and one-fourth inches. This will be the center from which to describe the circle, touching at twelve on the tongue, and at the intersection of the degree line, as at A, will be the distance apart that the points will be on the circumference. It is then an easy matter to draw the cross lines that form the star.

In Fig. 17 we show two squares with the blades and tongue intersecting at the figures that give the pentagon miter, and as will be seen, all of the angles form

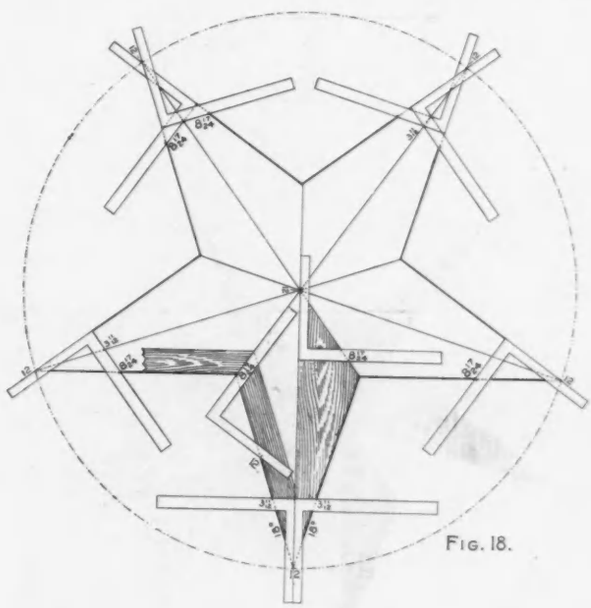


FIG. 18.

part of the pentagon. The stars are shown in connection with the same to further illustrate the accuracy of the illustration.

In Fig. 18 the lines are at 18 degrees on the square at the lower point of the star, and as will be seen, gives the miter for a frame star shape, the tongue giving the angle. From this it will be seen that the tongues of these squares are in a direct line with the center of the star. The squares at the top are set at 36 degrees, with their tongues in line with the 18 degree lines from the two lower squares, and form the angles for other parts of the star.

It will be seen that a star-shaped figure can be systematically framed either in the solid or in part, as shown, and that without first laying out a full-sized diagram, and the ten pieces will fit to their respective places. The figures 12 and 8 17-24 also furnish the basis for framing a root of this shape, and the general rule that applies to this, applies to all angles, as we

blade, as the tangents would below that point, but the cuts would be reversed on the square.

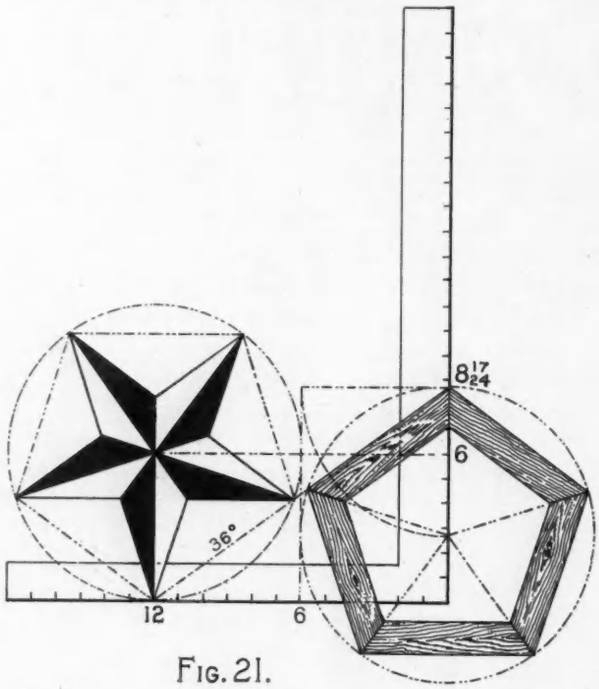


FIG. 21.

In Fig. 19 we have tried to make the subject of tangents and co-tangents clear by the use of two steel

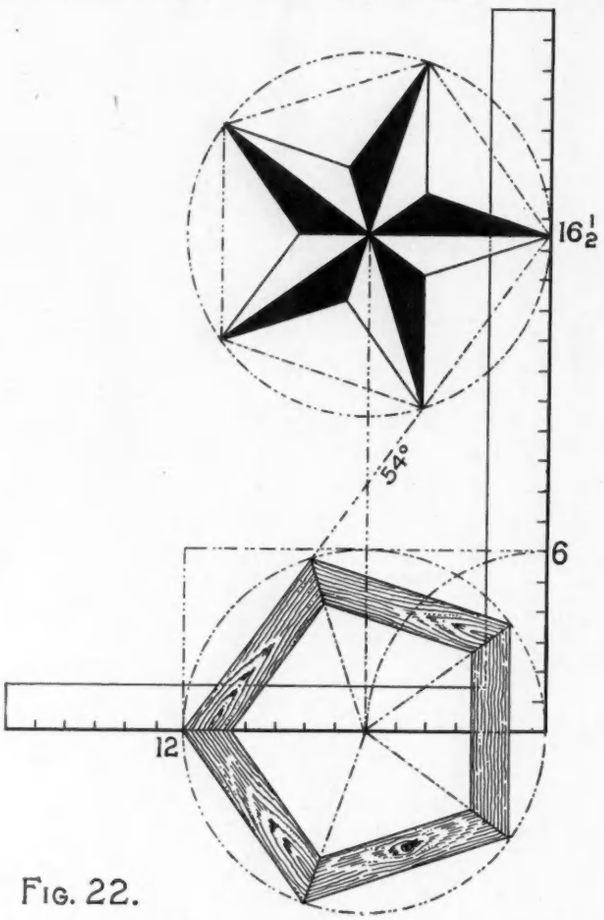


FIG. 22.

squares, placed as shown in connection with the quadrant. The blades and tongues intersecting at 12 and 12. Now, since a tangent is simply a straight line touching the side of a circle, we let the blades represent the straight lines intersecting a circle described from 12 on the tongue. Reading from the bottom up, the 36-degree line passes at 8.72 (8 17-24 inches) on the blade of square No. 1, and from this back to the heel is the tangent. Now, referring to square No. 2, what was 36 degrees on square No. 1 is 54 degrees, and passes at 16.51 (16½ inches), and from this point back to the heel is the co-tangent. Both squares give identically the same cut, in other words, what the tongue gives in one, the blade gives in the other. If we read the degrees from the top to the right, we have the same thing, only reversed on the square.

The 45-degree line, being at the half-way place on the square, remains unchanged. To illustrate this point a little further, we show two squares in a different position, as shown in Fig. 20, using the same figures on the squares as in Fig. 19 for the 36 and 54-degree line. Taking the squares separately, we show in Fig. 21, using the 36-degree line, the pentagon miter on the blade and the pentagon star resting at 12 on the tongue; while in Fig. 22, using the 54-degree line, the reverse is shown. In both of these illustrations the pentagon frame and star are inclosed in a circumscribed diameter of 12 inches, but they could be of any desired size.

A Carpenter Driving a Nail

How many hammer strokes does a carpenter use in driving a nail?

Perhaps not one carpenter in a thousand or one layman in ten times that number can tell, or ever thinks of it, says the Chicago Tribune. The truth of the matter is this: The carpenter takes seven strokes in driving a nail into ordinary wood and twelve regular strokes and two finishing strokes in driving nails into hardwood.

These figures are furnished by a man who works at night, and sleeps—or tries to sleep—by day, and whose bedroom window opens out upon a flat building in course of erection. He figured the average number of hammer strokes for nine mornings, and, having learned them, moved to a hotel until the new building is completed.

He discovered that the carpenter drives an average of three nails a minute in soft wood and a fraction under three in hardwood. At this rate he would drive 1,440 nails a day in soft wood, if he keeps up the gait steadily, and 1,282 in hardwood. He would give 10,080 hammer strokes in soft wood and 20,160 in hardwood.

"Fills the Bill"

We like the magazine and think it "fills the bill" with the carpenter and has lots of information for us. —Beebe Lumber Co., Hampton, Iowa.

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 FOUNDATIONS TO THE DELIVERY OF THE HOUSE TO THE PAINTER

STONES used for building purposes differ from bricks in being of unequal shape and size; in consequence of which considerable care must be taken in order to obtain a good bond. Bonding, as in brickwork, is the arrangement of the stones to overlap each other so that no continuous vertical joints occur. The unevenness of the stones, except in the case of cut stonework, also necessitate thicker mortar joints than are required in laying up brickwork.

To guard against fracture being caused by settlement, the length of the blocks should not, in the harder class of stones, exceed four or five times, nor the breadth be more than two or three times, the thickness. In the softer kinds of stone the length should not exceed three times, nor the breadth be more than one and one-half times, the thickness.

All stones should be laid on their natural bed; that is, laid on that plane of division along which the stones are split when obtained from the quarry. A neglect of this precaution very often causes the stones to split.

Fig. 15 shows a wall with the stones laid up random rubble. Stones of all shapes and sizes are used and for that reason require considerable skill in laying, as their irregular surfaces make them difficult to bed and bond. Proper bonding requires the insertion of through stones (marked T. S.) at intervals of four or five feet in the length of the wall, and about every eighteen inches in the height of the wall. An equally good substitute for a through stone, is a stone extending from the inside of the wall three-quarters the thickness of the wall, and overlapping another stone extending from the outside of the wall three-quarters the thickness of the wall. Through stones and three-quarter stones should be of sufficient thickness to prevent fracture through settlement of the wall. Fig. 16 shows a section through the wall.

Fig. 17, at A, shows uncoursed squared rubble, and, at B, shows squared rubble built up to courses. Both of these arrangements are superior to random rubble. In both cases the wall is built of rectangular stones with squared ends. In the latter case, the wall is brought to a level every fifteen to eighteen inches.

Fig. 18 shows a wall built up of field stones. This kind of a wall is used principally in the picturesque cottages and country homes.

Fig. 19 shows an elevation and section of coursed ashlar. Ashlar is a facing of stones, never less than four inches thick, used to cover walls of brick or rough stone, to which it should be securely anchored. Foundation walls, where ashlar is used, should be made of sufficient thickness to carry superstructure, independent of the ashlar unless the ashlar be at least eight inches thick and bonded into the backing, in which case it may be counted as part of the thickness of the wall.

CELLAR WINDOWS

Plate VIII takes up the construction of an ordinary cellar window in a stone wall. The sash is hinged at the top with heavy wrought iron butts and arranged to swing in. It is secured in place, when closed, by a catch on bottom rail, and, when open is secured with a hook on cellar ceiling or beams.

Fig. 20 shows the elevation; Fig. 21, the section, and Fig. 22, the plan.

Fig. 23 is a section through the head of the frame. The staff bead is sometimes omitted, but, as it makes a better finish at the junction between wood and masonry, hiding the roughness of stonework where it takes up with the wood, it is desirable to use it.

Fig. 24 is a section through the jamb. The "lug" is a piece left on the ends of head and sill and built into the wall to secure the frame in place.

Fig. 25 is a section through the sill. Stone sills near grade do not require a drip. The inside of the wall is finished in cement.

Figs. 26 and 27 show the head and sill of a window with an iron guard and a window screen outside of the sash. The iron bars are let into the head and sill about an inch.

The man who is too good for his job has a job that is too good for him.

If all would work a little, none would be overworked.

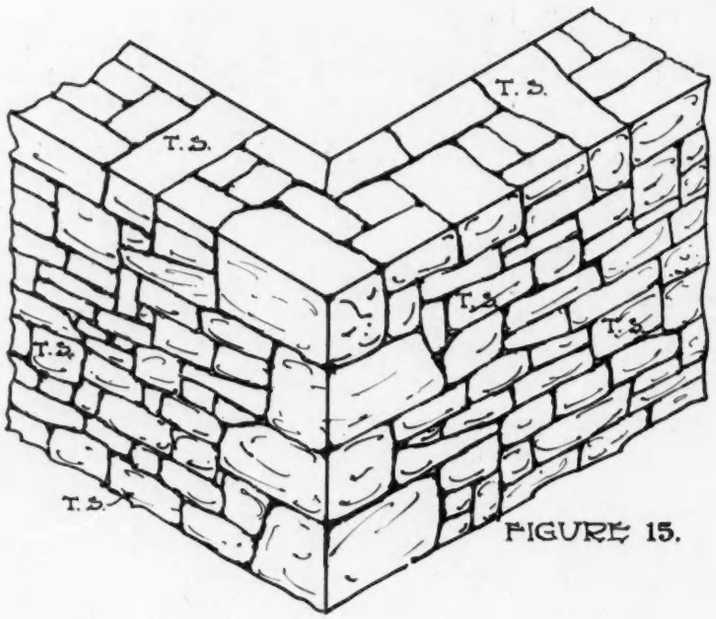
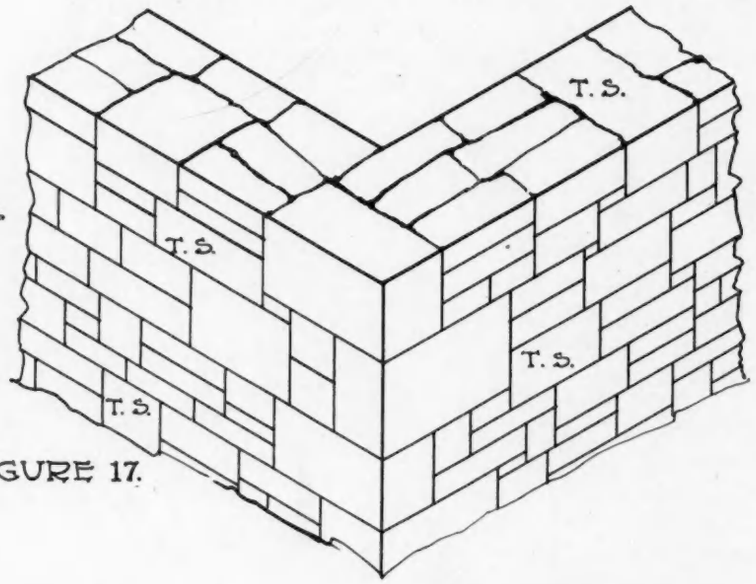


FIGURE 15.

FIGURE 16.



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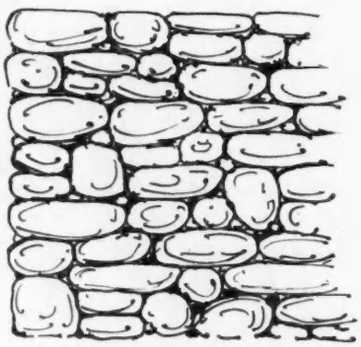


FIGURE 18.

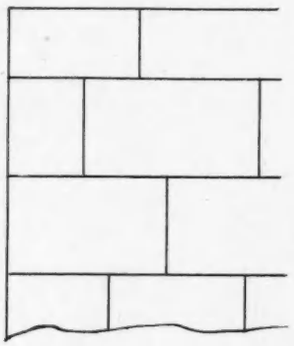
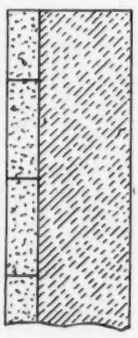


FIGURE 19.



SECTION.

PLATE VII.

BUILDING CONSTRUCTION.

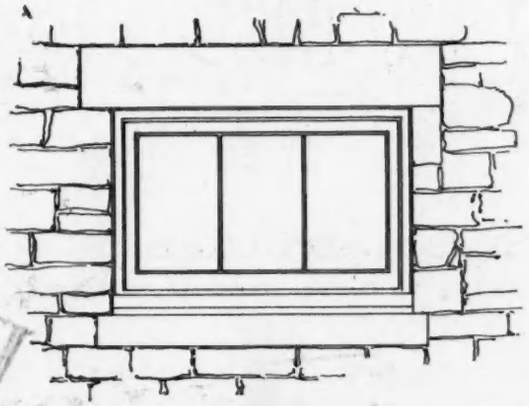


FIGURE 20.

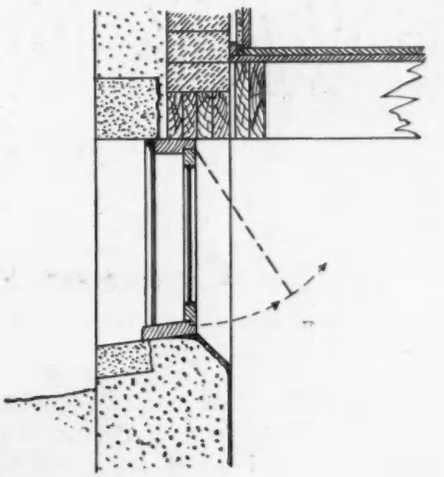


FIGURE 21.

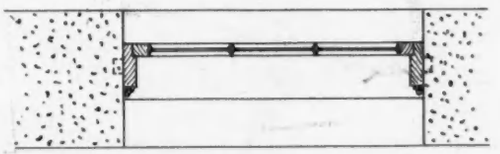


FIGURE 22.

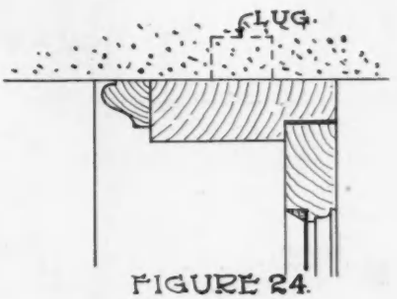


FIGURE 24.

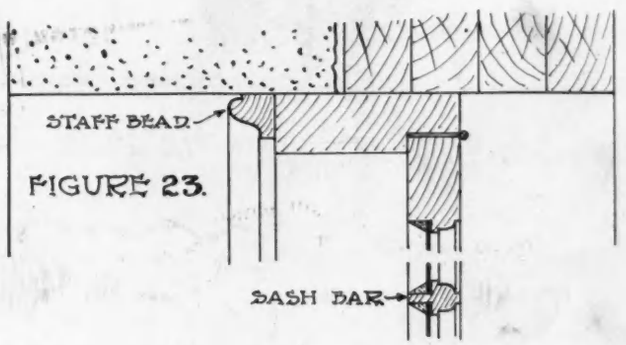


FIGURE 23.

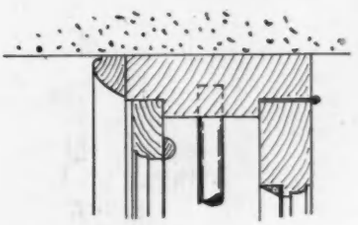


FIGURE 26.

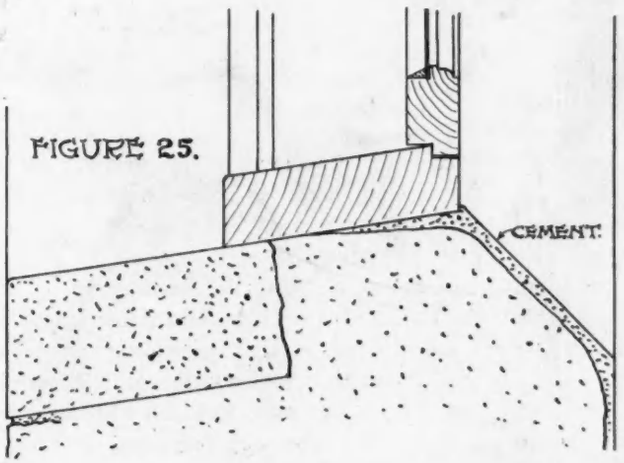


FIGURE 25.

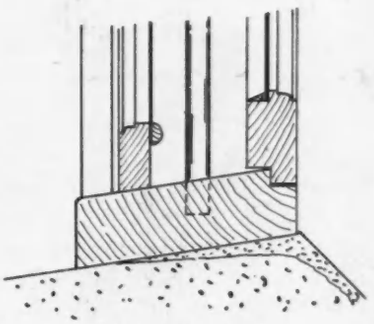


FIGURE 27.

PLATE VIII.

BUILDING CONSTRUCTION.

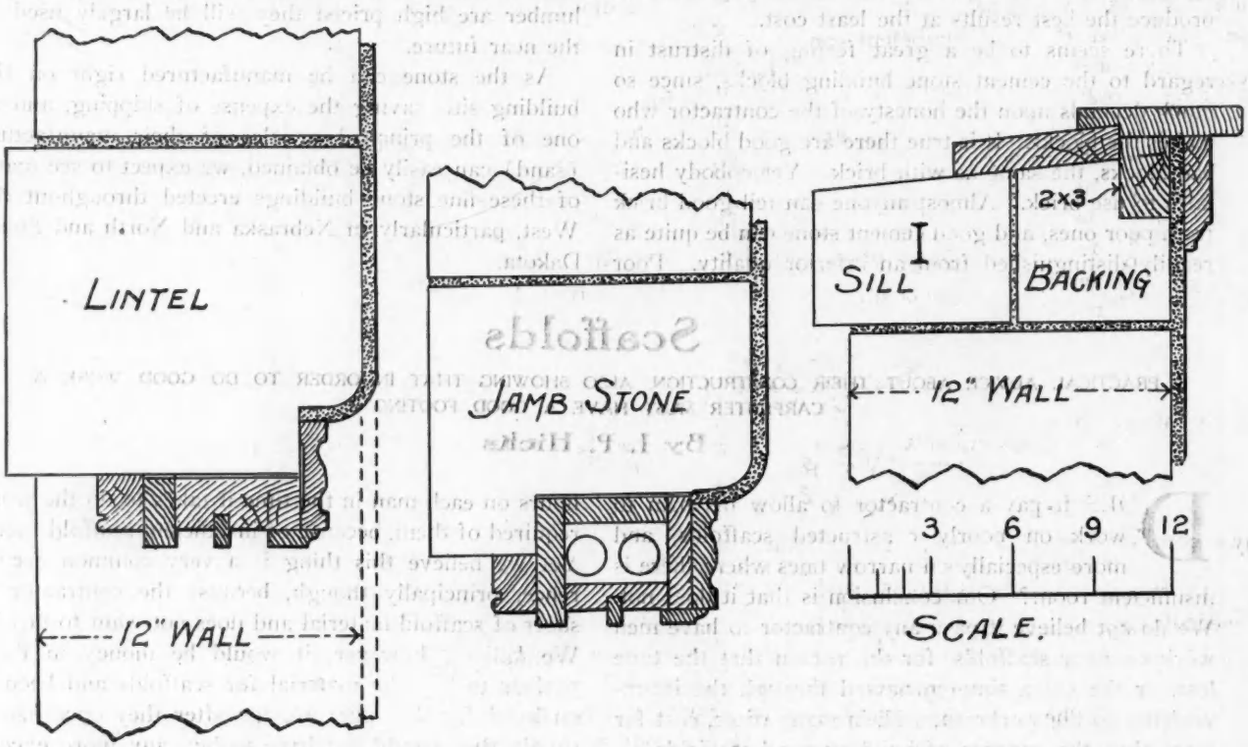
FRAMING A HOUSE

I. P. HICKS

Cement Block Construction

SPECIAL MENTION BEING MADE OF WINDOW SILLS AND HOW TO FASTEN WOODWORK TO CONCRETE BLOCKS—ADVANTAGES IN USING ARTIFICIAL STONE

THE DRAWINGS which accompany this article represent some practical details of construction in connection with the use of hollow cement building blocks. The sketch represents a twelve-inch wall which is considered of sufficient thickness



for any ordinary two-story building, such as school houses, halls, etc.

In hollow block construction only a thin coat of plaster is required, and this can be applied directly on the blocks without furring and lathing of any kind. One of the most essential things is to provide some means by which the interior finish can be securely nailed in place.

In the drawing, the backing stone which is shown back of the sill is recessed so that a piece of wood two by three inches can be put in; this forms a good nailing for the stool and apron of the window frame. The window sill which is marked "sill" can also be made of cement, and in case of long sills, they can be greatly strengthened by bedding a steel I bar, T bar or channel bar in the mold when the stone is molded. Even round bars could be put in, but we believe greater strength would be secured by putting in I or T bars. These can be had in suitable sizes for this kind of work and would add to the strength of the artificial stone when used for sills and lintels, and would not increase the cost of the stone to anywhere near the price of natural stone.

Note the shape of the jamb stone. This stone has the inside edge next to the window frame molded with a round edge, so that it can be plastered right up to the frame, thus making a neat window finish. The lintel is also recessed, to finish with a head casing and a rounded corner coming down to the casing. By this method the top of the frame is made to correspond with the sides, and the finish is complete. If the lintel was not recessed there would not be room for a head casing, and I think all will agree with me that

a window frame without a suitable head casing looks very much as if something was lacking and the finish was not complete.

Since artificial stone can be so readily molded into any shape desired, it seems to us a big mistake not to get the requirements in each particular place where they are to be used and mold them into the shape desired. Of course each particular shape will require some modification in the mold, but any ordinary mechanic can readily fix a mold to produce just what is wanted. For some special shapes the mold can be constructed entirely of wood, it is not necessary that molds for cement blocks be made of iron. Where only a few stones are wanted of special design, a wood mold will answer every purpose. If, however, anyone desires to engage in the manufacture of cement stone building blocks, it will undoubtedly pay them to obtain the best machines and molds made for this purpose, for in this business, as in all other kinds of business, those who have the best equipment can produce the best results at the least cost.

There seems to be a great feeling of distrust in regard to the cement stone building blocks, since so much depends upon the honesty of the contractor who makes the blocks. It is true there are good blocks and bad blocks, the same as with brick. Yet nobody hesitates to use brick. Almost anyone can tell good brick from poor ones, and good cement stone can be quite as readily distinguished from an inferior quality. Poor cement stone, like poor bricks, will break and chip off very easily, and apparently have but little strength. If the stones are hard and strong when they are being laid no fear need be entertained, for they get harder and better with age, and a stone a year old will be much stronger than one two or three weeks old.

All makers of cement stone, if they wish to continue in business, should produce a good article, for the public will not long be deceived in the quality of these blocks. People learn to determine what is good and what is bad in all kinds of building material, and they can readily learn to tell a good cement block from a poor one, and in a short time we expect to see this material used with the same confidence as any other building material. Not long ago hard wall plaster was looked upon with suspicion, but now it is almost universally used and has proved to be far superior to lime and sand as a plastering material. The cement building blocks will prove their value as a building material, and in localities where brick and lumber are high priced they will be largely used in the near future.

As the stone can be manufactured right on the building site, saving the expense of shipping, and as one of the principal articles of their manufacture (sand) can easily be obtained, we expect to see many of these fine stone buildings erected throughout the West, particularly in Nebraska and North and South Dakota.

Scaffolds

PRACTICAL ADVICE ABOUT THEIR CONSTRUCTION, ALSO SHOWING THAT IN ORDER TO DO GOOD WORK A CARPENTER MUST HAVE A GOOD FOOTING

By I. P. Hicks

DOES it pay a contractor to allow his men to work on poorly constructed scaffolds, and more especially on narrow ones where there is insufficient room? Our conclusion is that it does not. We do not believe it pays any contractor to have men work on poor scaffolds, for the reason that the time lost, or the extra time consumed through the inconvenience to the workmen, will, in many cases, cost far more than the expense of building good scaffolds.

No man, however good he may be at climbing and moving around, can accomplish much, working from a scaffold which has only one piece, six or eight inches wide, for a footing. The workman who is compelled to work on a scaffold of this kind will naturally consume considerable time in looking for a safe place to step, for he will be compelled to guard every movement he makes, and when it comes to sawing boards on this kind of a scaffold he is at a very great disadvantage.

The building of a good or poor scaffold is only a question of a very few minutes, and it surely cannot pay a contractor to save twenty minutes on two men in building a scaffold, and then lose from one to two hours on each man in the time it takes to do the work required of them, because of insufficient scaffold room. Yet we believe this thing is a very common occurrence, principally though, because the contractor is short of scaffold material and does not want to buy it. We believe, however, it would be money in their pockets to buy the material for scaffolds and keep it on hand for that purpose, for after they once had a supply they would not have to buy any more except to replenish the natural loss from wear and tear, which, under ordinary conditions, should not be very large.

We believe that the folding scaffold brackets are a good investment. With them a large amount of lumber is saved in building scaffolds, also time in putting them up, and a large saving in breaking and splitting of boards, for the lumber does not have to be nailed and renailed until it is worn out and wasted. It will pay contractors to be a little more up-to-date and adopt modern methods of doing business. Anyone having a watch to repair would not think of taking it to a blacksmith, neither can a carpenter do a day's work on a scaffold fit only for a rope-walker.

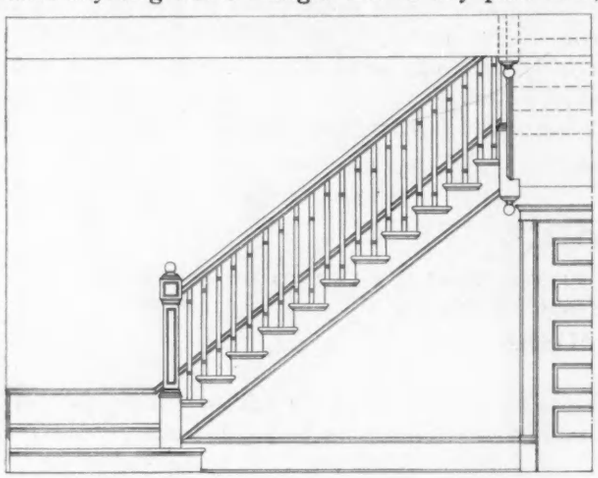
PRACTICAL CARPENTRY

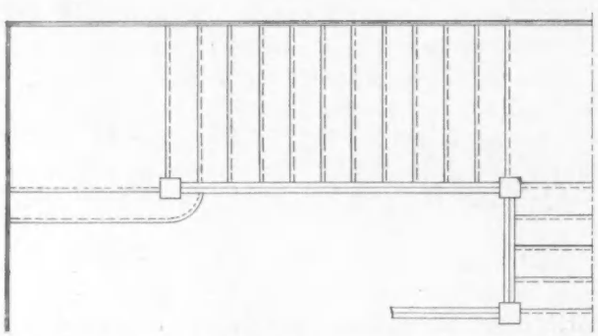
Constructing an Ordinary Stair

KIND OF HAND-RAILING DEPENDS ON FINISH OF STAIR HALL—POSITION AND USE OF THE NEWEL—VARIOUS DETAILS OF CONSTRUCTION

By Lewis R. Steinberg

IN THE accompanying sketch, the different points that are covered in this article are shown as they occur in actual practice. A hand rail of some kind is necessary on all open stairs, whether it is one simple run or a very elaborate and complicated stair. Anyone handy with tools may get out and fit a rail such as is shown in our sketch, but when the stair takes anything but a straight line in any part of it,





and as a result a rail with the same outline, the problem becomes more difficult. However, a good mechanic who understands the principles of hand-railing, and these will be taken up in a later article, will have no trouble in getting out the most complicated piece of hand-railing.

The rail is the most important part of the stair as far as its appearance is concerned. But the rail alone cannot be used to make the stair attractive. Everything in the room in which the stair is located should be in harmony with it. It would be very out of place to put an elaborate railing on the stair when the finish in the stair hall is plain, and on the other hand a well-finished stair hall should have the stair finish of the same grade.

In the ordinary dwellings the stairs are placed more or less as shown in the sketch plan. In the more costly houses where restriction to a simple plan is not so necessary the variation of the stairs is almost without limit. If the hall is long and narrow the stairs may be put in the full length without landings, otherwise when there is not room for one straight run, landings must be used. It will very often be found convenient to have a landing one or two risers above the floor, as shown in the sketch, and then if it is necessary, another near the top.

The newel at the bottom may rest directly on the floor, or the first step may be carried around it, and the second riser then joins the face of the newel. The string and the railing and also the risers at the landings should be on the center line of the newels. Where treads or risers occur at a newel they should be housed the same as in the string. When the space under the stairs is enclosed by a wall coming up under the face string, no other support is necessary, but where this space is left open it is well to extend the newel from the landing down to the floor to act as a support at this point. When this is not necessary because of other means of support, the newel is stopped off just below the string with an appropriate drop. At the top, the newel may project below the ceiling with a similar drop, and receive the string on one side and the trim of the well-hole on the other side. The rail about the well-hole should be similar in design to that on the stair. Where the rail joins the wall it is better to put a half newel against the wall to receive the rail.

In the plainer stairs the balusters are set upon the floor or treads at regular intervals. A bottom rail may be used to receive the lower ends of the balusters. Where these are of a more elaborate design or when pierced panels are used this should always be done. If the span is very long the bottom rail should be

blocked up in some manner, so as to give the proper solidity to the rail. Where paneling is used this may not be necessary as the panels will stiffen the rail sufficiently. The rail may join the newel on the bevel or by using a goose neck the rail joins the newel with a square cut. At the lower end the rail may join in the same manner by turning the end up as it approaches the newel.

The mouldings on the rail may be carried around the newel so that it has the appearance of the rail being divided and wrapped about the newel. This is usually only done on round newels, as they could receive the rail in no better manner. On square newels a flat surface is left at the height of the rail for it to fasten to. This should be just below the cap or the top finish of the newel. Below this square surface a sunken panel should be introduced and should reach down to the base of the newel. The sketch will show more clearly how the finished newel will appear.

The turning on the balusters may run parallel to the rail and string or they may be run horizontal and rise with each tread. The turnings at the top may be parallel to the rail and at the bottom horizontal, that is, parallel to the tread. This last method requires that the balusters vary with their positions. A glance at the sketch will make this clear.

A carpenter may get up a very good design for a stair by selecting the material from the stock book of a sash and door mill. However, where an architect is employed the details for the stairs are or should be furnished and the builder will then have no trouble in following out the design.

Setting Studding

SHOWING DIFFERENT WAYS IN WHICH IT CAN BE MADE, ALSO HOW TO MAKE A PARTITION CORNER TO PREVENT PLASTER FROM CRACKING

By Dwight L. Stoddard

IT IS indeed a simple thing to set studding and yet it is surprising how many mechanics, and many of them good ones, set them apparently without any thought. This causes them a good deal of bother and work, as it results in the plaster cracking in the corners.

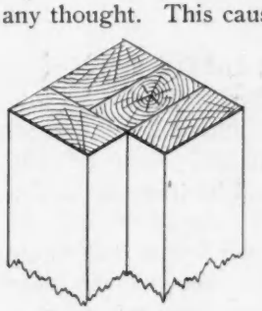


FIG. 1.

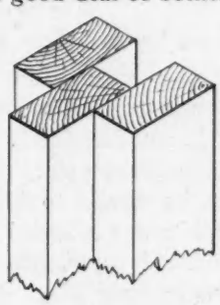


FIG. 2.

Fig. 1 shows a corner post made out of four studding, or the center one can be made out of short pieces, almost any carpenter knows how to make one—yet apparently few know how to make one practically as good, in less time and less lumber by nailing them together.

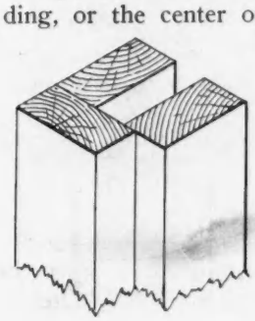


FIG. 3.

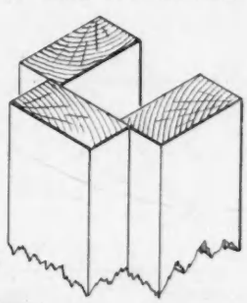


FIG. 4.

Fig. 2 shows an easy way and would be all right if the thickness of two was the exact width of one, but many times they are not, and so it is better to nail them together as in Fig. 3. I have made them this way for years and I consider them a very good corner.

Fig. 4 makes the best partition corner I know of. It is made much easier than one with blocks nailed in between two studding and then one nailed on the blocks, and my observation has been that it does not crack the plastering.

Fig. 5 is practically the same as Fig. 4. It is made for partitions which are made the flat way of the studding.

Fig. 6. While it is not quite as good as the ones just mentioned, it does very nicely, especially if one is running short of studding. It is simply to nail a sheathing board on the back.

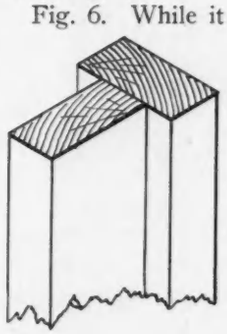


FIG. 5.

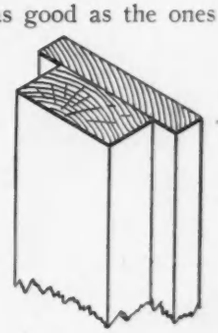


FIG. 6.

Fig. 7 carries out the same idea in double joist under partition for floors as Fig. 6 does for receiving the lath and plaster. This saves the necessity of nailing pieces on to the sides of the joists to receive the ends of the flooring.

If you wish to make the joists rigid this may be

done by nailing three-inch blocks in between, as shown in the illustration. It is better to nail the blocks to one of the joists first and then nail the second joist to these blocks. This makes it just far enough apart to spike the studding on top in a good and substantial manner.

Fig. 8 shows a very good way to construct a corner

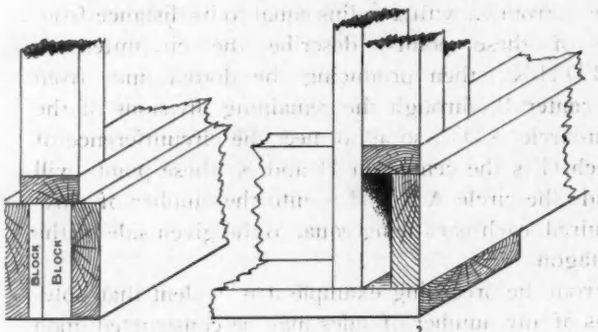


FIG. 7. FIG. 8.

post in connection with a box sill. Nail a studding flatwise on top of the joist at the sides of the building on which to rest the studding. Set the end joist in just enough to receive the end studding making a good strong and tight job.

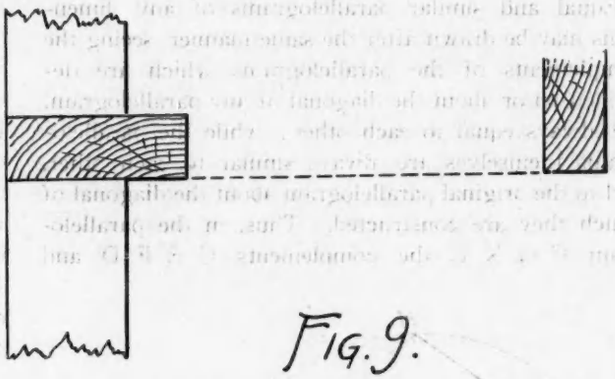


FIG. 9.

Fig. 9 shows a very good way to make the top of the end studding by putting on a two by six for a plate. This should be set with its lower edge even with the bottom of the ceiling joists. This makes a solid angle and prevents the plaster from cracking.

The Making of a Practical Carpenter

III. FULL EXPLANATION AND ILLUSTRATIONS SHOWING HOW TO CONSTRUCT FIGURES COMMONLY USED BY BUILDERS—ALSO HOW POLYGONS OF ANY NUMBER OF SIDES CAN BE CONSTRUCTED UPON A GIVEN STRAIGHT LINE

By Frank F. Addison

IN THE first two articles, we have given the names and illustrations of the different geometrical figures a carpenter is liable to meet in the course of his work; the next step is to learn how some of the various figures are constructed.

Suppose a line is to be divided into any number of

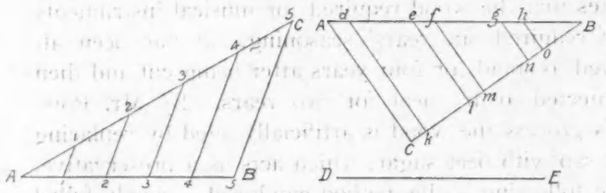


FIG. 18. FIG. 19.

equal parts; let A B, Fig. 18, be the given line and you wish to divide it into five equal parts. From the point A draw the straight line A C, forming any angle with A B. On the line A C, with any convenient opening of the compasses, set off five equal parts toward C; join the extreme points C B; through the remaining points, 1, 2, 3 and 4, draw lines parallel to B C, cutting A B in the corresponding points, 1, 2, 3 and 4; A B will be divided into five equal parts as required.

There are several other methods by which lines may be divided into equal parts; they are not necessary, however, for our purpose, so we will content ourselves with showing how this problem may be used for changing the scales of drawings, whenever such change is desired. Let A B, Fig. 19, represent the length of one scale or drawing, divided into the given parts Ad, de, ef, fg, gh, and hB; and D E the length of another scale or drawing required to be divided into similar parts. From the point B draw a line B C equal D E, and forming any angle with A B; join A C, and through the points d, e, f, g and h, draw dk, el, fm, gn, ho parallel to A C; and the parts Ck, kl, lm, etc., will be to each other, or to the whole line B C, as the lines Ad, de, ef, etc., are to each other, or to the given line or scale A B. By this method, as will be evident from the figure, similar divisions can be obtained in lines of any given length.

To describe a rectangle or parallelogram having one of its sides equal to a given line, and its area equal to

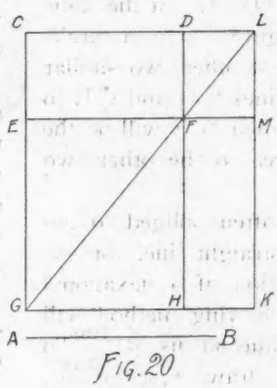


FIG. 20.

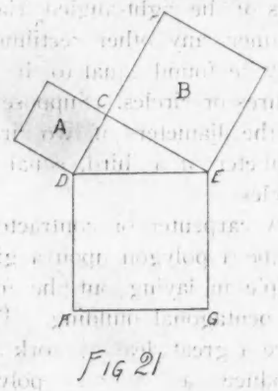


FIG 21

that of a given rectangle. Let A B, Fig. 20, be the given line, and C D E F the given rectangle. Produce C E to G, make E G equal to A B; from G draw G K parallel to E F, and meeting D F produced in H. Draw the diagonal G F, extending it to meet C D pro-

duced in L; also draw L K parallel to D H, and produce E F till it meets L K in M; then F M K H is the rectangle required.

Equal and similar parallelograms of any dimensions may be drawn after the same manner, seeing the complements of the parallelograms which are described on or about the diagonal of any parallelogram, are always equal to each other; while the parallelograms themselves are always similar to each other, and to the original parallelogram about the diagonal of which they are constructed. Thus, in the parallelogram C G K L the complements C E F D and

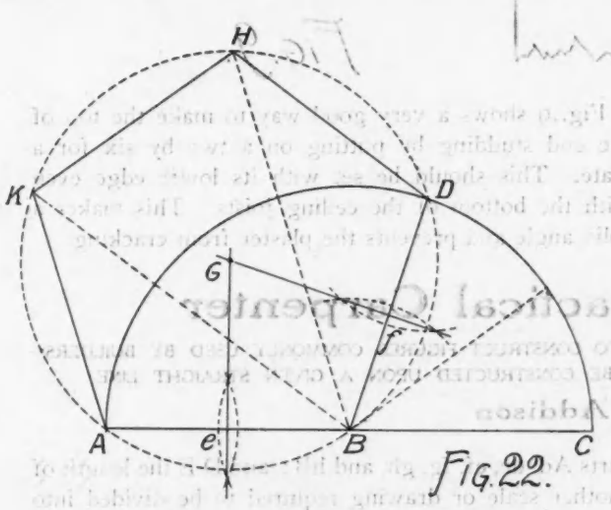


FIG. 22.

F M K H are always equal, while the parallelograms E F H G and D F M L about the diagonal G L, are always similar to each other, and to the whole parallelogram C G K L.

Let us suppose you have two squares and wish to construct one square equal to the two that you have. Let A and B, Fig. 21, be the given squares. Place them so that a side of each may form the right angle D C E; join D E, and upon this hypothenuse describe the square D E G F, and it will be equal to the sum of the squares A and B, which are constructed upon the legs of the right-angled triangle D C E. In the same manner, any other rectilineal figure, or even circle, may be found equal to the sum of other two similar figures or circles. Suppose the lines C D and C E to be the diameters of two circles, then D E will be the diameter of a third, equal in area to the other two circles.

A carpenter or contractor is often obliged to describe a polygon upon a given straight line, for example in laying out the foundation of a hexagonal or pentagonal building. The following method will save a great deal of work and time on his part. To produce a regular polygon draw A B to C, Fig. 22, so that B C may be equal to A B; from B as a center, with radius B A or B C, describe the semi-circle A D C; divide the semi-circle into as many equal parts as there are parts in the required polygon, which let us say in this case to be five; through the second division from C, draw the straight line B D, which will form another side of the figure. Bisect A B at e, and B D at f, and draw e G and f G perpendicular to A B and B D; then G, the point of intersection, is the center of a circle, of which A, B and D are points in the circumference. From G, with a radius equal to its distance from any of these points, describe the circumference A B D H K; then producing the dotted lines from the center B, through the remaining divisions of the semi-circle A D C, so as to meet the circumference of which G is the center, in H and K, these points will divide the circle A B D H K into the number of parts required, each part being equal to the given side of the pentagon.

From the preceding example it is evident that polygons of any number of sides may be constructed upon the same principles, because the circumference of all circles, when divided into the same number of parts, produce equal angles; and consequently, by dividing the semi-circumference of any circle into the number of parts required, two of these parts will form an angle which will be subtended by its corresponding parts of the whole circumference. As all regular polygons can be inscribed in a circle, it must necessarily follow, that if a circle be described through three given angles of that polygon, it will contain the number of sides or angles required.

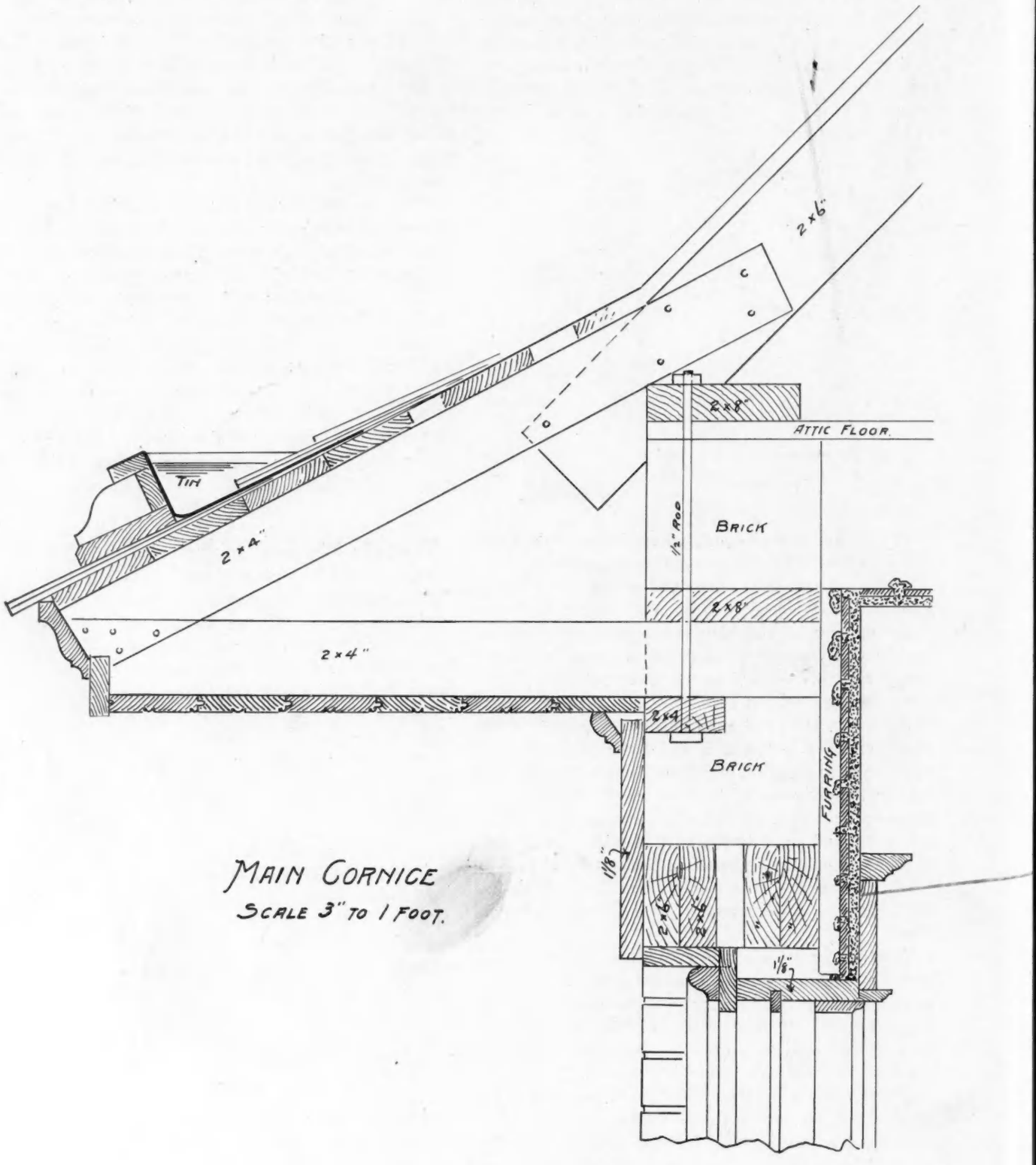
French Method of Seasoning Wood

W. P. Atwell, United States consul at Roubaix, France, reports a new process for wood seasoning, invented by Mr. Powell, an Englishman. Mr. Atwell states that the wood required for musical instruments has required six years' seasoning. It has been allowed to stand for four years after being cut and then subjected to dry heat for two years. By Mr. Powell's process the wood is artificially aged by replacing the sap with beet sugar, which acts as a preservative. The following is the method employed: Newly felled wood is laid on a wagonette, which is rolled into a huge cylinder, the interior of which is provided with pipes. Either hot or cold water, as occasion requires, may be introduced into these pipes. The wood having been placed in the cylinder, the latter is supplied with sugar or saccharine, and the wagonette, with its burden of wood, is rolled into a special room, where it is dried by currents of hot air. After being cooled again, the wood, properly seasoned by the sugar, is ready for use. It is said not to spring or gather dampness, and to be proof against destruction by insects.

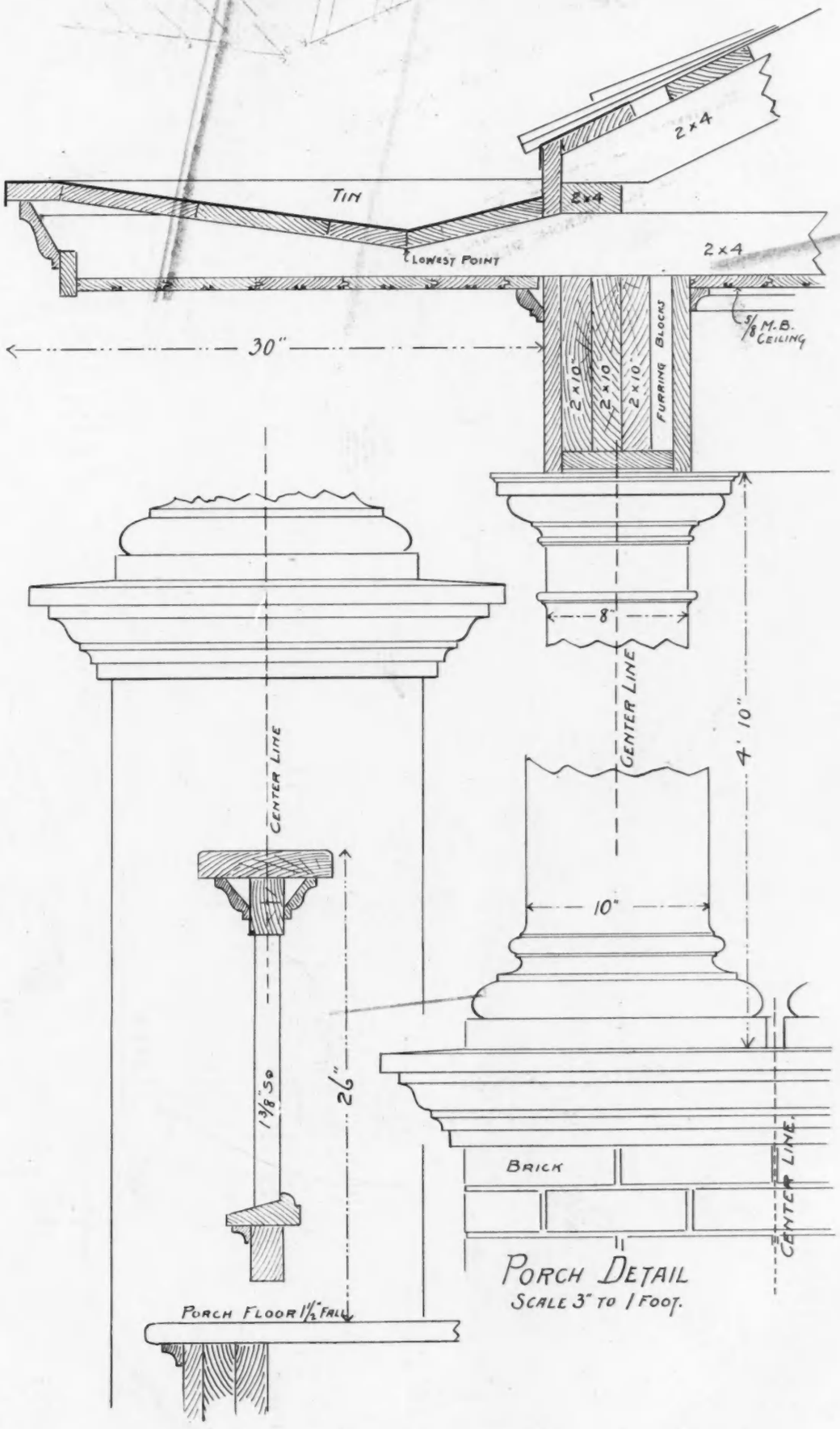
It takes a sharp pencil, sometimes, to figure out and correctly estimate cost in mill work, but the question that keeps a man awake most nights is not so much what it costs as how to get the price for it.

Details of Construction

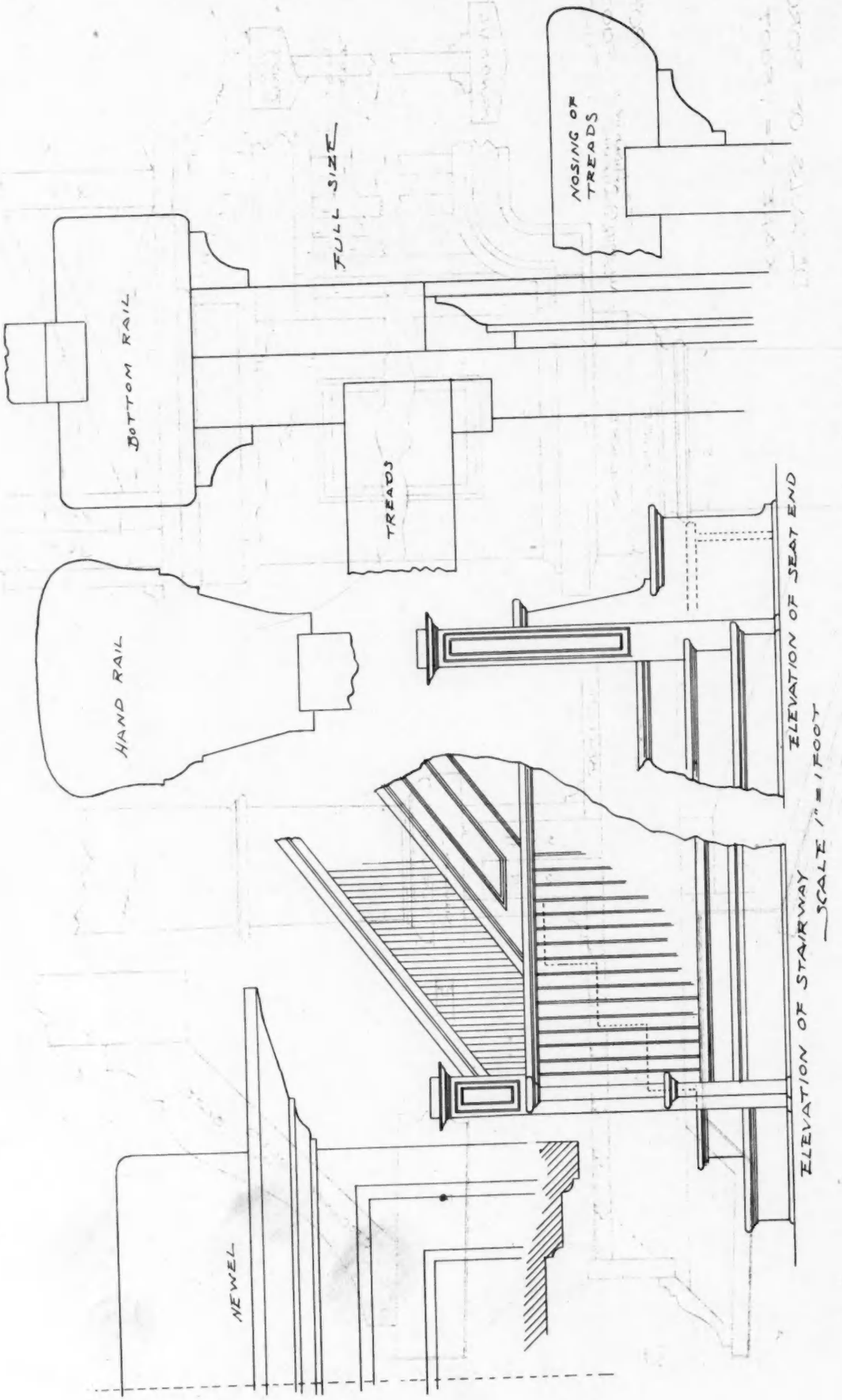
FROM MONTH TO MONTH WE WILL PUBLISH UNDER THIS HEAD DRAWINGS SHOWING THE DETAILS OF INSIDE AND OUTSIDE TRIM, INCLUDING PORCHES, CORNICES, WINDOW AND DOOR FRAMES, PANTRY CASES, STAIRS, CABINETS, SIDEBOARDS, ETC.

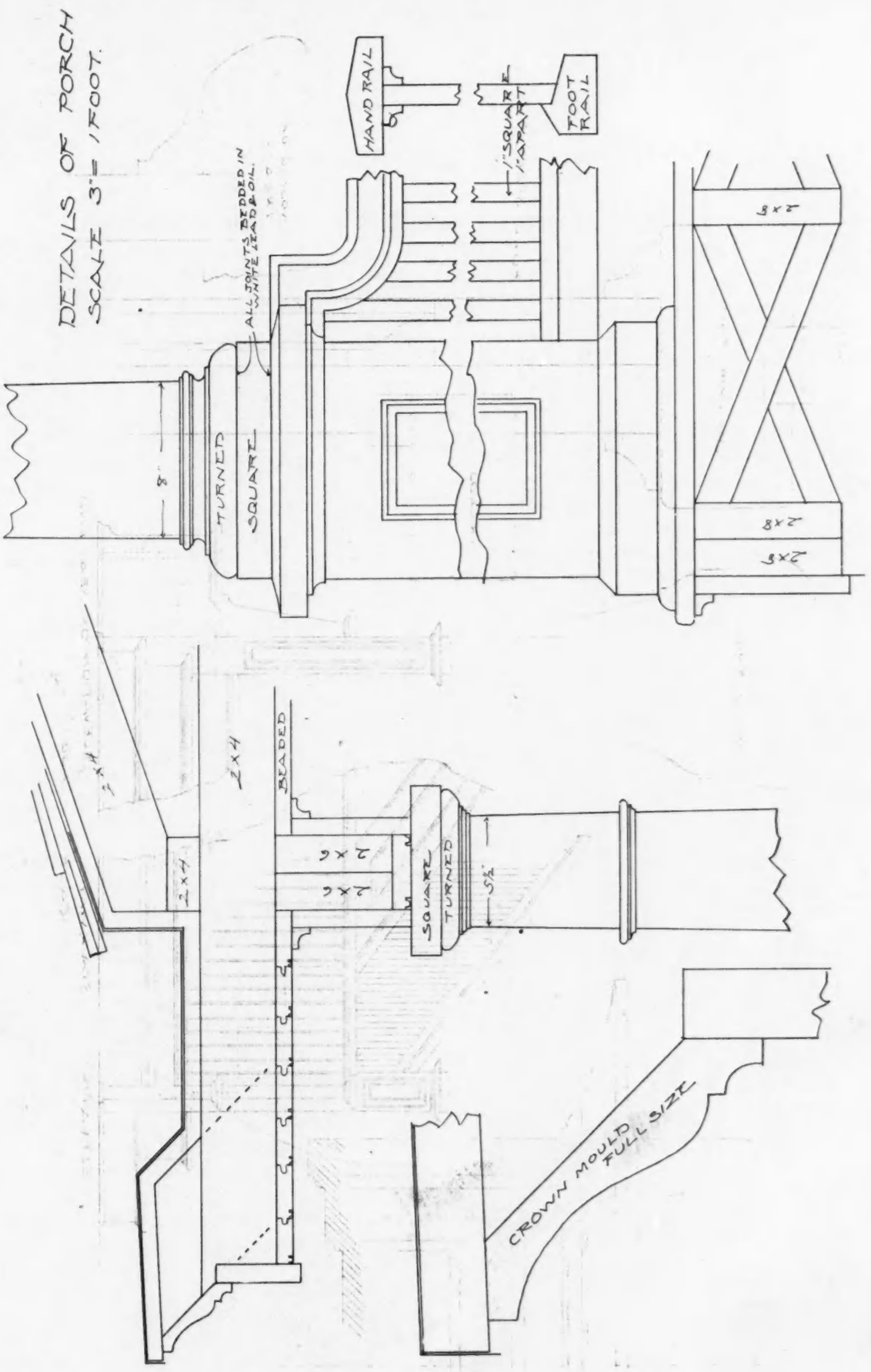


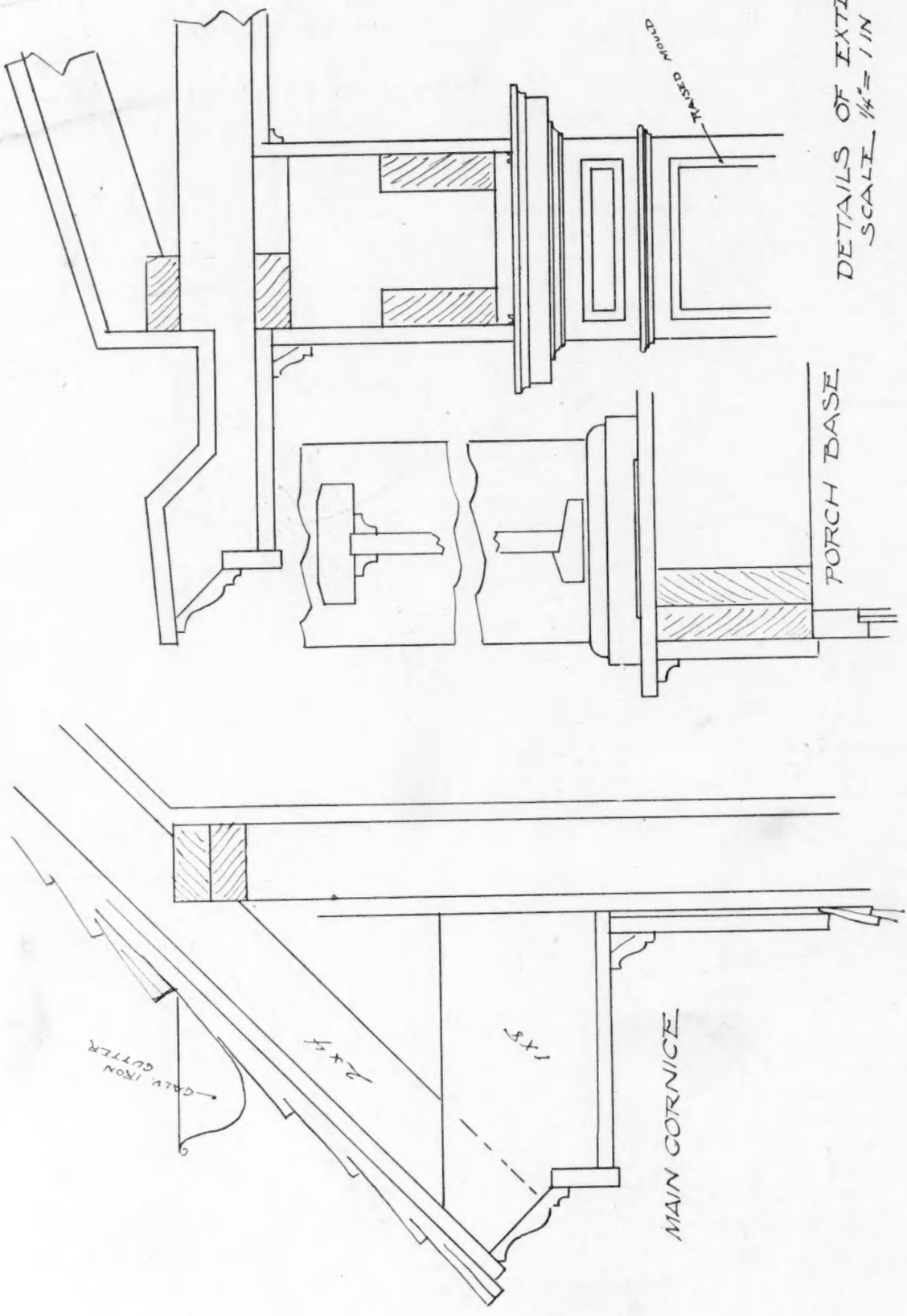
MAIN CORNICE
SCALE 3" TO 1 FOOT.



PORCH DETAIL
SCALE 3" TO 1 FOOT.


FULL SIZE
NOSING OR TREADS
BOTTOM RAIL
TREADS
HAND RAIL
ELEVATION OF SEAT END
ELEVATION OF STAIRWAY
SCALE 1" = 1 FOOT
NEWEL


DETAILS OF PORCH
SCALE 3" = 1 FOOT.
HAND RAIL
FOOT RAIL
1" SQUARE
1" APART
ALL JOINTS BEDDED IN WHITE LEAD & OIL.
8"
TURNED
SQUARE
2 x 8
2 x 8
2 x 8
2 x 4
2 x 4
BEADED
2 x 2
2 x 2
SQUARE
TURNED
5½"
CROWN MOULD
FULL SIZE


DETAILS OF EXTERIOR
SCALE 1/4"= 1 IN OR 3"=1FT.
MATCHED MOULD
PORCH BASE
MAIN CORNICE
2 x 4
1 x 8
CAST IRON GUTTER

Planing Mill Work

J. Crow Taylor.

Properly Running a Rip-saw

MUCH TROUBLE IS CAUSED BY HAVING TOO MUCH SPEED AND BY SAW BENDING IN THE CUT — CONDITIONS UNDER WHICH BEST WORK CAN BE OBTAINED

A SHORT while ago I called at the establishment of a prominent builder and found the proprietor and one of his helpers having all sorts of trouble with a little rip-saw. They were ripping some two-inch oak plank into smaller dimensions and both were sweating and working like beavers while the saw was alternately producing sawdust and smoke. After worrying through a plank or two it dawned upon the proprietor that he ought probably to put on another saw for this class of work, and while he was doing this I made a little study of that machine, and also did some thinking about general rules for bringing to order a refractory saw. This task brought to mind what my friend said about the automobile. He said, "When you have trouble with an automobile, nine times out of ten your sparker is not working, or your gasoline is failing to flow." There is no direct connection between an automobile and a rip-saw except that there is a sort of double rule of this kind that applies to the saw, too. In other words, nine times out of ten when there is trouble with a rip-saw it is either running too fast or the saw blade is binding in the cut.

Just a little study of the machine in this case furnishes plenty of evidence that the trouble was caused by both too much speed and by the saw binding in the cut. The machine was an iron frame rig of modern pattern, and appeared to be in excellent condition, and was, in short, such a machine as one would naturally select for doing neat work of not too large proportions. The machine was electrically driven and speeded rather high, which made the saws cut clean and neat, but this together with the fact that some of the saws were thin really served as a handicap to operations when the work to be done was of a coarse, heavy nature. The saw this builder was trying to cut his oak plank with was a very thin, fine-toothed saw, closely set for doing neat work, which was naturally out of its element when it was put to plowing through two-inch green oak. He took this saw off and put on another one, one of the thickest he had in the shop, and though it pulled rather heavy and made the work very slow, it did it without any serious trouble. It did not dawn on this builder, however, that with slower speed he could probably have done the work just as well with a light saw, especially if it had sufficient set to clear the blade. The trouble was, he had never made a close study of saws, considering, as many do, that the operation of the rip-saw is a very simple thing and does not require any special study or skill. This is a mistake that many make, and for the benefit of those who may be making this mistake and don't know it, the following little study in rip-saws is presented.

SPEED OF CIRCULAR SAWS

There are various troubles that come from time to time in the operation of circular saws, and it is a little difficult sometimes to point out which is the worst trouble of the lot, but generally speaking, the greatest trouble that besets the operation of circular saws, both in quantity and quality of ailments, comes from too much speed. The normal speed of circular saws, as given by saw manufacturers is generally based on a periphery or rim speed of ten thousand feet per minute, which reduced to revolutions of the various sizes of saws gives the speed for each, that is, the number of revolutions each size saw should make per minute to travel ten thousand feet.

SPEED OF CIRCULAR SAWS RUNNING TEN THOUSAND FEET PER MINUTE

72	inch	530	revolutions
68	"	560	"
64	"	600	"
60	"	640	"
56	"	700	"
52	"	750	"
48	"	815	"
44	"	890	"
36	"	1,080	"
32	"	1,225	"
28	"	1,400	"
24	"	1,630	"
20	"	1,960	"
16	"	2,450	"
12	"	3,260	"
10	"	3,920	"
8	"	4,600	"

BAD EFFECTS OF HIGH SPEED

This is what we might call the maximum speed, and to operate saws successfully at this speed requires a man skilled in the work, if the operation is to be carried on without serious trouble from time to time. Even then there are many operators who contend that this speed is too high, and nine thousand or even

eight thousand feet rim speed is enough under ordinary conditions. This high speed and the centrifugal pull generated by it tends to expand the rim of the saw, making it touchy and limber, so that it will only stand up and do its work when in the very pink of condition, that is, when it is perfectly sharp and the corners full, so that the blade will clear the cut freely. The least bit of rubbing in the cut at this high speed generates heat which adds to the expansion already set up and starts the saw waving and snaking at an alarming rate, and frequently results in accidents. These troubles can be, and are guarded against by hammering the saws, that is, expanding the centers, so that when this high speed is reached and some expansion sets up in the rim the saw will be stiff instead of limber. This work though calls for a skilled man and is beyond the ken of the average operator of rip-saws, and while one may have saws hammered up at the saw factory for any speed desired, they soon run down under incompetent handling until the work must all be done over again, or else the saws will not run satisfactorily. For this, and a number of other reasons, it is much better to run saws at a lower speed. In fact, it is decidedly better to run a saw too slow than to run it too fast. In that case we only have a possible reduction in the volume of work done, while if running too fast, we not only endanger the volume but the quality of the work.

SAWS RUN TOO FAST

Now, this talk about running too fast is not given as an abstract idea, but because of the fact that probably seventy-five per cent of the saws in operation in this country are being run too fast to-day. It begins at the sawmill where the man with a little mill thinks to do more work by increasing his speed, and it continues through the larger mills and into practically all wood-working establishments. Just who, or what is responsible for it all is difficult to say, and we might probably just as well lay it up against the fact that we Americans are a rather swift people and are not satisfied with well enough, but always want to do better and do it in less time than anybody else. With this kind of atmosphere surrounding us it is no wonder that Tom Jones wants to run his saw faster than John Smith is running his, and so it goes, with nobody apparently realizing that there is a limit beyond which it is not wise to go. We have gone our pace in saws all right, and now the more experienced wood-workers are realizing that less speed and more care in manipulation of wood is necessary to success, as wood is getting scarce and valuable, and at the same time purchasers of wood-work are getting more critical and want quality more than quantity.

OTHER CAUSES OF TROUBLE

Next to the running saws at too high speed, the most prolific cause of trouble in operating circular saws comes from the saw binding in the cut. When saws are running at too high speed we frequently have this trouble, too, but we also have it at times when saws are not speeded too high, due generally to being insufficiently set. Sometimes, however, it is due to lack of alignment, and at other times it is the result of having too much saw exposed for the work being done. The first thing a man should do to any rip-saw is to see that it is set wide enough to clear the blade, and to get this set, it is nearly always advisable to swage or spread the ends of the teeth, and it is very seldom satisfactory to spring set them as we do with the hand rip-saw. A saw in operation does its first wearing on the corners of the teeth, and if the saw is set by springing the teeth when it wears a little, the tooth must be sprung out a little more and the final result is the narrowing of the teeth at the point and the forming of a heavy, slick shoulder that is not conducive to either light or good work. The only practical way to guard against this wearing off at the corners is to keep the saw-teeth perfectly square and swage the points for set. Then when your corners wear down or get rounding, you can swage them again and spread them out enough to square up and make the right shape on the point again. This, of course, uses up a saw more than spring setting but you get more satisfaction out of using it, and that is what we are after. And, by the time a saw is used up you not only get more satisfaction, but you get more work out of the saw.

SAWS USUALLY TOO LARGE

While it is absolutely essential, if you want to do good work and do it in a satisfactory manner, to have set enough in your saw-teeth to clear the blade nicely, it is not always necessary to do as much spreading on the points of the teeth as some may think. In other words, you can assist in this work by reducing the amount of saw-blade employed to the smallest dimensions consistent with the work. The best way to do this is to use saws as small as possible, that is, saws that will just reach through the work nicely, as by this means you obtain the minimum in width of saw-blade necessary to the work. When this is not practical, when the saws in hand are all larger than is necessary, the next best thing is to raise the table or lower the saw, depending on which of the two is made adjustable, until just enough of the saw extends above the table to do the work. If you should have a rig in which neither of these may be done, that is, one in which there is no means of adjusting either saw or table, you can make an improvement by having a false top or part of a top to go on the saw table, which, of course, has the effect of raising the working surface of the table up just to the extent of the thickness of this false top. The false top need not be any wider than is necessary for the work in hand and can be fastened to the table by hand-screws or clamps if you do not care to bore holes and make bolts for this pur-

pose. This may all sound like going to a lot of trouble to reduce the area of saw in use, but it is really not so much trouble as a saving of trouble.

Many a rip-saw operator makes his first mistake by buying his saws too large anyway, usually buying them so that they will reach the heaviest work they may possibly have, thinking that they will do the lighter work just as well or even better than smaller saws, while the fact of the matter is, the smaller the saw the better work you can do, and you can do it on the closest possible set, so that the work is smoother and nicer every way than if made on a larger saw where it becomes necessary to put a coarse set in the saw to clear the blade. If you have some heavy work to do, enough to justify, it is all right to buy a large heavy saw for that purpose, but if you have much light work to do, it is equally necessary from a good business standpoint to have smaller saws to do the work, for the smaller saws in addition to doing the work better and nicer, require much less power and prove more satisfactory in every way. To sum the matter up short, what you should keep in mind is to run the smallest saw possible for the work in hand, and if the smallest saw you have extends up through the work two or three inches you should raise the table or lower your saw until it just clears through the top nicely. There are a number of other pointers about using a rip-saw, in fact, there is more to be said about this machine than any other simple machine on the whole list, but this is enough for one time.

Plans of Concrete Cottage

SHOWING THREE ELEVATIONS WITH COMPLETE FLOOR PLANS WITH THE DIMENSIONS OF THE DIFFERENT ROOMS—SUBSTANTIAL, PRACTICAL AND MODERN

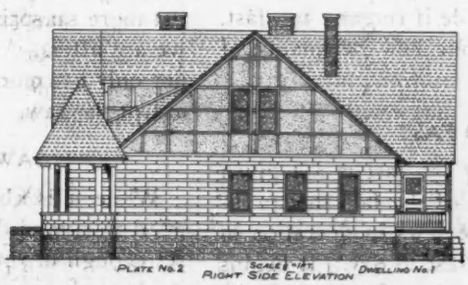
By Fred W. Hagloch

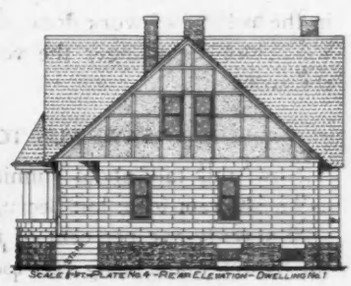
This plan can be constructed with blocks made on any machine which makes blocks 32 inches long, 9 inches wide and 4½ inches high.

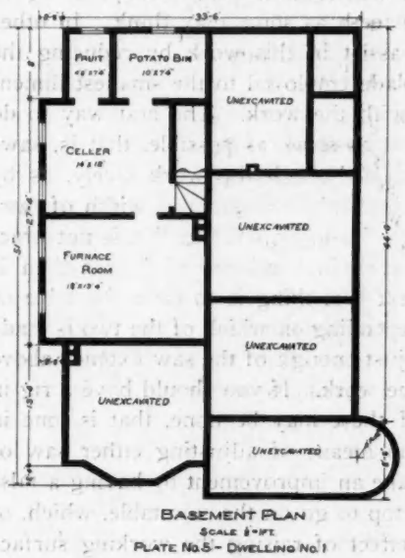
Using Cleveland, Ohio, as a basis, this building will cost as follows: Slate roof, hardwood interior finish, polished oak floors in four rooms, complete plumbing, exterior of walls waterproofed, $4,275. If a shingle roof, natural oil yellow pine interior, selected pine floors, with plain plumbing and waterproofed walls are used the cost will be $3,580.

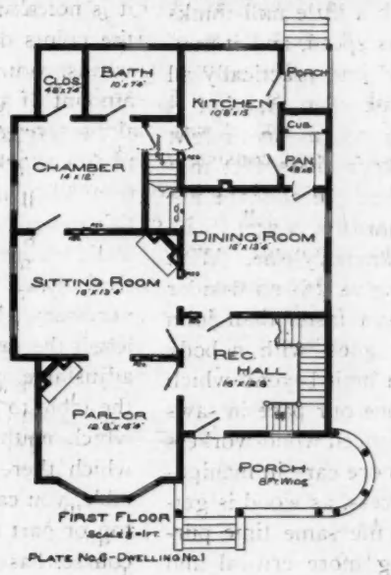
These prices are based on a purchase price of concrete blocks at forty cents each, but those having their own machine can save from $380 to $440 on the above cost.

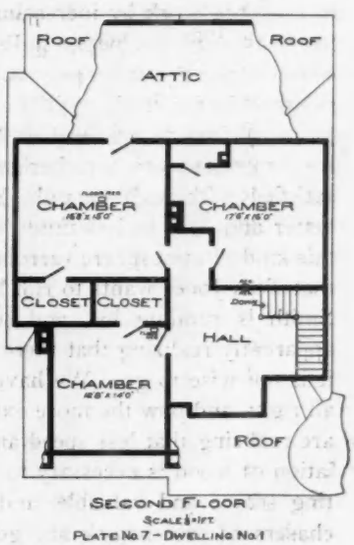
The plan has all the desirable features of a substantial, practical and modern cottage.











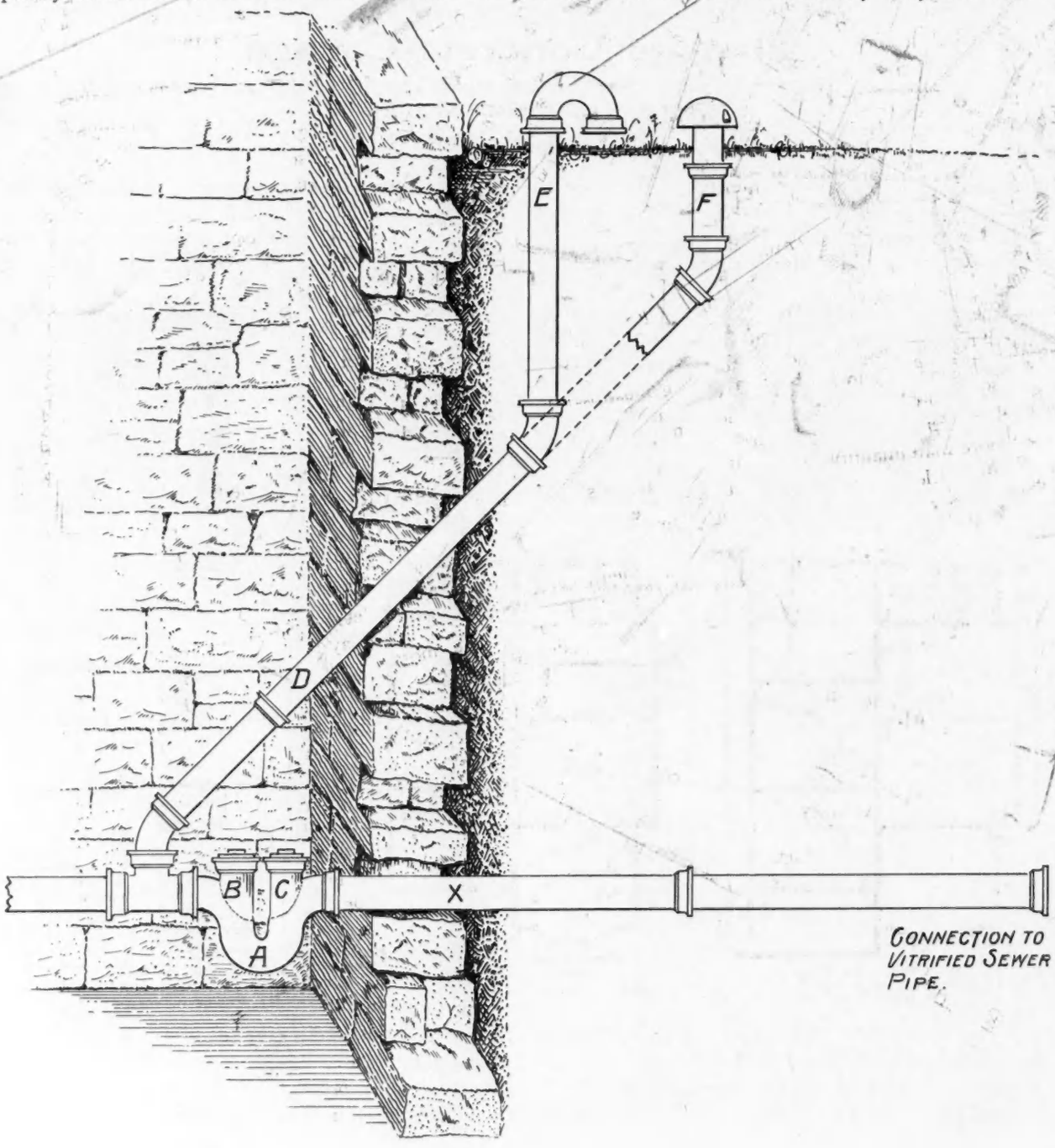
Plumbing

WM. R. MARSHALL.

Plumbing and Its Development

A MODERN AND EFFICIENT DRAINAGE SYSTEM, GIVING THE SIZE AND KINDS OF PIPES AND VALVES TO USE—MOST ADAPTABLE FOR A RESIDENCE

IN THE drainage system illustrated, we have a very excellent one for a residence. The fittings as shown are standard stock articles, and consequently reduce the cost to a minimum. In the ordinary residence, a four-inch pipe is sufficiently large enough to carry away all of the sewerage. A drainage pipe must not be so large, that the ordinary flow of water will fail to float and carry away the refuse



CONNECTION TO VITRIFIED SEWER PIPE.

which ordinarily accompanies water. The pipe should be laid to grade, or a fall of one foot in forty feet. Care should be exercised to allow a large enough opening in the wall where the pipes pass through it, and especially over them, to allow for settling of the wall without touching them.

Extra heavy cast iron soil pipe, weighing thirteen pounds to the foot, coated inside and out with hot asphaltum, should be used in all cases for house drainage.

At "A" we have what is called a double-vent opening running trap. By caulking a four-inch brass ferrule, with a brass-trap screw ferrule, into the hub at "C," we have the opening which gives free access to the drainage system on the sewer end. Care should be taken in making this joint, and a good grade of spun oakum should be packed around the ferrule, with an iron yarning tool. The hub should then be run full at one pouring with soft moulten lead, and then thoroughly caulked with a blunt caulking iron, which will make an absolutely air-tight joint. The trap-screw cover should be screwed tightly into the ferrule with a good pliable gasket. It is very necessary that this joint be hermetically sealed—as pipe "X" will constantly be loaded with sewer-gas from the main sewer, and any defective work at this joint will allow it to escape into the basement unobserved. The vent opening at "B" is treated in the same manner, giving an opening which permits easy access to the trap.

The vent pipe "D" is run at an angle of forty-five degrees, and the extension "E," which is run to the surface in this particular instance, is run close to the foundation wall, and the elbow caulked on the top of the pipe, which prevents a possibility of any sticks, stones or other debris getting into same and retarding a thorough circulation. In order to have this drainage system properly vented, the fresh-air inlet pipe should be the same size as the drain pipe. Where it is impractical or impossible to run this fresh-air vent up close to the foundation wall and turn it over as shown, it can be run as shown by dotted lines "F," and when placed in the yard the inlet pipe can be capped with a regular vent-cap fitting. Care should be taken in placing this fresh-air inlet, so that the chances of having it knocked off and broken will be as small as possible.

The extension piece in all cases should be long enough to permit of the opening in the vent-cap being, at least, eight inches above the ground. In the sketch we show the sewer or drain pipe above the floor. In cases of this kind rests or supports should be provided at an interval of five feet, or in other words at every joint, to prevent same from sagging and breaking the joints. When placed underground the top of opening "B" and "C" should be on a level with the flooring. In case of a shallow sewer in the street, the piping can be suspended from the ceiling, with a good heavy hanger supported by a joist clamp or ball-bearing swivel joint, which will permit the hanger being shortened or lengthened after the pipe has been hung. This is very advantageous, as it permits leveling up the run to grade, after being hung.

Papering a Room

Remember a double roll of paper contains seventy square feet when you wish to ascertain the amount required for a room, says the Housekeeper. Walls that have never been papered should be covered with size. This is made by adding six quarts of hot water to one-half pound of glue which has been softened by standing all night covered with cold water. Walls that have been painted should be gone over with ammonia water —one part of ammonia to six parts water. Board ceilings must be covered with cloth before papering.

To paper the ceiling cut as many strips as will be necessary to cover it and leave long enough to allow about two inches, taking care to make the pattern match. Draw a chalk line across one end of the ceiling sixteen inches from the wall as a guide for hanging the first strip which goes between this line and the wall and will lap down on the side a little. Lay the strip on a table, apply the paste evenly, fold both ends toward the center, making them meet and being careful that the ends are even. Trim the paper with shears. Unfold one end, commence at the side and start the strip straight by the line, smoothing it down as you go with a brush. Keep the rest of the paper in front of you, letting it hang over a roll of paper which you hold in your left hand.

After the first strip is on the rest is easy. The last strip must also lap down on the side wall. Cut the paper for the side wall long enough to come under the border a little. Begin to lay it at the side of a window or door. Unfold the top of the strip, put in position, then work downward. Lay on each strip in the same manner, put on the border, and the work is done.

The following is a good recipe for paste: Take one and one-half pints of flour, rub smooth in a quart of cold water, add four quarts of boiling water and let boil slowly, stirring constantly ten minutes. When cold, stir in one tablespoonful of powdered alum. Never use warm paste and make it quite thin.

Durability of Wood

Some interesting experiments have been made to ascertain which wood lasts the longest. It was found that birch and aspen decayed in three years, willow and chestnut in four years, maple and red beech in five years and elm and ash in seven years. Oak, Scottish fir and Weymouth pine decayed to the depth of half an inch in seven years; larch and juniper were uninjured at the end of seven years. In situations so free from moisture that they may be practically called dry the durability of timber is unlimited. The roof of Westminster hall is more than 450 years old.

Heating a Home

GRADUAL DEVELOPMENT FROM THE OPEN FIRE-PLACE AND STOVE TO THE PRESENT DAY HOT WATER, STEAM AND OTHER SYSTEMS FOR WARMING THE HOUSE—WHY THE HEATING APPARATUS OFTEN CAUSES TROUBLE

FROM time immemorial fire has been used as a means of furnishing heat for the home. That its use will be continued there is no doubt, notwithstanding the idea, that electricity will take its place, advanced by those who forget that electricity is itself generated and transmitted from fire by a necessarily wasteful process, which makes such a proposition unlikely for many years to come.

In olden times the fireplace occupied a prominent place in architecture, usually of commodiously large proportions, designed to provide not only for comfort but a means for cooking. Indeed it was not an uncommon occurrence at Christmas time to roast an entire ox before the fire, afterwards to be cut and eaten in the warm glow of the open fire place, where

> "The Baron's retainers so blithe and gay
> Were keeping their Christmas holiday."

Hence, because of its association, the fireplace will be retained for many years, if not for its utility, then in a modified form as an ornament. Our sturdy New England ancestors turned their backs (so to speak) upon the open fireplace on account of the waste of fuel. They refused to saw wood for its accommodation and instead placed an iron box in the center of the room to be warmed, and this box warmed the air of the dwelling instead of drawing the air up the chimney from the doors and windows. It was found to be more economical and incidentally relieved the older people of cold backs. This box or stove has been improved from time to time. Its pieces are now beautifully carved and molded. The fit of its various parts are accurate in the extreme. Its mountings and ornaments added to such features as the self-feeding draft regulators, means for circulating the air in the room, etc., have excited the curiosity and admiration of foreigners to such an extent, that the American stove of today is not only a home utility but a work of art of which no American need be ashamed.

Heating is to-day of greater importance than most of us are aware. Our homes are larger, we demand the greatest convenience consistent with economy, our public and private institutions are enlarging to an enormous extent, factories and combinations of factories cover large areas and are often provided with heat from one central plant. Hence the intelligent manager or owner of such an institution finds it to his advantage as a matter of economy in the first cost and operation to be guided by the intelligence of a competent engineer, that he may purchase and apply such an apparatus as may best suit his requirements.

The present methods of heating are generally known as: Stove heat, hot air furnace heat, hot water, hot blast, steam heat, each having its advantages and disadvantages, modifications and appliances suitable for various purposes. Each also being amenable to certain fundamental principles that should guide in its adoption and application, such, for instance, as the size of the building to be heated, its character, location, the use to which it may be applied, character of fuel to be used, its arrangement, the temperatures required, etc., which the writer will endeavor to present to the readers of this journal in a manner intended to not only interest, but to add to the general information of its readers. Of the art of cooking it is said that in order to cook good things "one must be provided with good things to cook with," which is also true of heating and perhaps every other business. In other words, first learn the art as far as practical. This information can be gained from the honest manufacturer of any good form of apparatus, also information as to the proper appliance of the devices he may manufacture, as it is reasonable to suppose that being the manufacturer he must have intelligent knowledge of the thing he makes. In large installations, however, a combination of apparatuses is sometimes required. In such cases information as to the art can best be obtained from those who make such installations a business.

An intelligent architect with reference to the subject of heating, says, "There is no part or appliance of the home or any building that deserves consideration more than the heating apparatus, for without heat there is discomfort and annoyance. My observations lead me to the opinion that fully eighty per cent of the work put in is not only uneconomical and expensive to keep

in repair, but soon becomes an absolute nuisance." It may therefore be reasonable to ask "Why is this?" Should you ask the owner you will find he either blames the device itself, the man who sold it, or the man who put it in, and perhaps all of them. The information he received on this subject before making his purchase was probably in the shape of pointers gained from his neighbors and friends, most of whom have had their own experiences and are ready to propound a cure as readily as if it were a case of rheumatism. His best pointer was probably received from Jones, who recommended a Brown apparatus. Hence when the agent arrived whose duty it was to sell the goods, the owner was promptly furnished with a low price and exceedingly abundant guarantee that the apparatus in question was exactly what it was. When it failed to do the work expected of it the owner probably tried every prescription advised by his friends, with the usual result—failure. The writer was called upon to prescribe in a case of this character last winter and was assured by the owner that he had staid up all of two nights during the cold spell "to make the blame thing work." Investigation verified his statement, also that the apparatus which in its original form might have served a good purpose had been so misapplied, fixed and battered, that the only possible remedy was the same as prescribed for the Irishman's gun.

Another case: A board of directors representing a public institution, well meaning, who occupied the positions as trustees because of the honor of the position, not on account of the work involved, their duties therefore being in the nature of a pastime, passing resolutions to do things, whereas in their private business they would have demanded of their employes a specific stated performance, which they were fully able to comprehend in all its details, but in this case they resolved to be guided by the opinion of one whom, if their common sense had been exercised, would have been found wanting in the elements of the work to be performed. The result of all this was a bad job.

Still another case: A committee appointed to install a heating plant. They ask at the appointed time to receive bids—on what, they do not dwell at great length, more than that it is to do heating. They receive the bids (all kinds). The business being of a public character, it is decided to award the contract to the lowest bidder on his own specification. The result of this is that the aforesaid committee can recite weird details of how they have been imposed upon and deceived by others, when as a matter of fact they received just what might have been expected.

Contrast these methods with the management of one of our well-known institutions who mark out the duties of every employee. The manager of this institution, himself, some twenty-five years ago planned and installed a heating plant after carefully studying the requirements. This apparatus is in operation to-day after twenty-five years of service. It is now being enlarged by the most complete and modern methods which the said manager understands in detail before work is commenced. Success will certainly be the result in this as in other parts of the business with which he has been connected for thirty years. His management and intelligence have increased the value of the plant fifteen hundred fold. His is a case of intelligence applied and the other cases are the result of another person's guess.

As a general rule, where a person will find out for himself as far as possible what the construction and application of any apparatus should be with which he is not familiar, and will use his own good sense in the selection based upon information gained from reliable sources, he will seldom fail.

A Novel Balanced Door

A Belgian inventor, Mr. Joseph Henri Dierickx, has recently produced a door which is a radical departure. It consists of two leaves, which are so pivoted that they will swing into partitions as the door opens, leaving an entirely clear passageway. Thus, the new doors partake of the advantages of both the hinged type and the sliding type, while avoiding their objectionable features. The common hinged door has heretofore been considered the most satisfactory type where space allows of its use, because of the ease with which it can be swung open. The sliding door, while it overcomes space objections, is nevertheless not perfect. The rollers on which it travels are too apt to slip off the track, causing the door to stick and jam.

Mr. Dierickx's door is formed of two triangular leaves, which, when the door is closed, meet on a diagonal line of junction. The leaf, which is largest at the top, is pivoted at the lower corner, and the other leaf is swung from a pivot above the center of the doorway. A rod connects the two leaves in such manner that when either one is swung in a certain direction, the other will swing in the opposite direction. Thus, in opening the door, it is not necessary to seize both leaves and move them, for if either leaf is moved into or out of its pocket, the other will automatically move in harmony with it. The two leaves are also so connected that they counterbalance each other, and they are controlled in their movements by suitably grooved guides, in which they travel with a minimum of friction. No rollers are necessary. The peculiar shape of the door is apt to strike one as awkward at first; but this is due mainly to the fact that we have always been accustomed to rectangular doors. There is no reason why a diagonal door should not be as artistically arranged as any other. It will certainly afford adventurous architects an opportunity to develop new and striking designs.

It is the best journal I have ever read.—Chas. Boyer, Piqua, Ohio.

Painting the New House

III. TREATMENTS TO GIVE AND KINDS OF COMBINATIONS TO USE IN COVERING GALVANIZED IRON—TIN ROOFS—CONCRETE BLOCKS—BRICKWORK

SO FAR we have considered only the wooden surfaces of the outside of the house that are usually painted. But there are several other classes of outside painting that need to be separately considered because each requires a special treatment. As has been already stated, there is no one best paint, and the material that, in a given location, will be best adapted for coating a wooden surface will be utterly unfitted for painting the ironwork and will not do at all for painting such surfaces as concrete building blocks or brick walls, each of which not only requires a special material but sometimes needs a preparatory treatment in order to make any paint hold.

PAINTING GALVANIZED IRON

No more puzzling problem is set before the painter than that of painting galvanized ironwork so that it will stay painted. Unless a preparatory treatment is given, almost any ordinary paint will sooner or later, peel off in great sheets, rolling over like so much paper. Whether this is due to a lack of affinity between the zinc that is used for coating the sheet iron and the paint film, or whether it is due to the oil or fat that is used in the process of galvanizing, or whether it is due to some electrical action between the zinc of the galvanized iron and the metallic constituent of the pigment is not clearly known, but the difficulty of painting new galvanized iron is so generally recognized that in many cases it is left unpainted until the action of the weather has caused it to rust, when the paint will cling to the surface. But unfortunately this is merely substituting one evil for another, because once rust sets in, it will go on under the paint and will eventually destroy the iron.

Different methods of preparation have been recommended for galvanized iron, the object of them all being to coat the surface with a thin film of gray oxide of zinc, to which the paint will firmly cling. Washing with a strong solution of common soda or with dilute muriatic acid are both suggested, but the best wash to use is prepared by dissolving two ounces of chloride of copper, two ounces of nitrate of copper and two ounces of sal ammoniac in one gallon of water and afterward adding two fluid ounces of crude hydrochloric acid. This solution must be made in a glass or earthenware vessel to prevent precipitation of the copper salts. After the galvanized iron has been coated with this solution it will assume a black color but on drying over night it will turn a light gray. Upon this surface a priming composed either of pure red lead, or of mineral brown, thinned with equal parts of raw linseed oil and turpentine or a priming composed of half mineral brown and half red lead, ground together dry and mixed by hand with equal parts of raw linseed oil and turpentine, will form a basis upon which any oil paint may be successfully applied. It must be remembered, however, that the priming coat should in no case be thinned with oil **only,** but always with half oil and half turpentine.

Venetian red has also been recommended as a priming coat for galvanized iron—after the preliminary wash has been applied. But no matter whether this or the less expensive mineral brown is used, care should be taken in the selection of any oxide of iron paint for coating ironwork of any kind, to see that it is free from sulphur. Mineral brown is made from a native iron ore, which is roasted and changed into peroxide of iron. For many years it was put on the market under the name "metallic paint," but this last name has also been given to many inferior paints made from the refuse left after the manufacture of sulphuric acid from iron pyrites. Such paints contain a considerable percentage of sulphur, and though they may be offered at a low price they are positively injurious to iron or tin, since the action of the rain or moisture will convert this sulphur into sulphuric acid, which is a powerful corrosive agent. Instances are on record of tin roofs painted with these cheap metallic paints that have been riddled with holes like a sieve in less than a year because of the acid action of the paint, which in this case became an agent of destruction rather than a preservative.

PAINTING TIN ROOFS

The painting of tin roofs is closely allied to the painting of galvanized iron, because roofing tin is composed of thin sheets of iron coated with a mixture of tin and lead. Price cutting has induced the manu-

facturers to increase the proportion of the lead, thus making the quality of the terne plate much inferior to what it was formerly and greatly increasing the difficulty of giving it adequate paint protection. Moreover, in many cases the specifications provide for the tin roof painting to be done by the roofer, instead of by the painter, with the result that this work is very poorly done and the materials used are of the cheapest possible description. Many tin roofs are painted with the cheap metallic paints, described above, mixed with substitute or so-called "paint oils," made largely from rosin and petroleum products. The paint is but a thin wash at best and the protection afforded by it is practically nothing—if it is not worse than useless.

To make the paint of real value the tin roof should be painted with the same care as the rest of the building and a practical painter should be employed to do the work instead of a tinsmith's apprentice. It is, first of all, essential that the tin should have at least one coat of paint upon the under side—two coats are far better—before it is laid upon the roof. The reason of this is that there is always more or less condensation on the under side of every tin roof, and the moisture deposited upon the metal will inevitably cause rusting unless there is an adequate protective coating of waterproof paint. This painting should be done after the tin has been soldered together in long strips ready to be put on the roof, and the paint should then be allowed to become thoroughly dry before the roof is laid.

In making tin plate the sheets are dipped into palm oil and this renders painting very difficult. Moreover the process of soldering adds another difficulty. Many painters and tinners will tell you that it is best to wait before painting the roof until the surface gets a little rusty, in order to make the paint hold better. But no greater mistake could be made because the real object of painting a tin roof should be to prevent it from rusting, while the practice of letting it rust before painting simply encourages it to continue to rust. To get rid of the palm oil is a very simple matter, all that is needed being to sponge off the roof with benzine, when the tin is ready for immediate painting.

Opinion varies somewhat as to what is the best paint for a tin roof, but it seems to be pretty well settled that either Prince's mineral brown or a first quality silica—graphite paint—will give satisfaction. The oil should be more elastic than for painting woodwork, since the expansion and contraction of a tin roof with heat and cold is a factor that must be reckoned with. For this reason either a genuine kettle-boiled linseed oil should be used or, if raw oil is employed, enough fish oil or other non-drying oil should be added to render it elastic, though it should neither be tacky nor so non-drying as to wash off.

PAINTING CONCRETE BLOCKS

The increasing use of concrete building blocks is bringing a new difficulty to the painter because, undoubtedly, many people will insist that their houses shall be painted at once. Concrete surfaces, whether they be building blocks or cemented walls, cannot be successfully painted until the caustic properties of the cement have become neutralized either by time or by the use of a wash which has the effect of changing the chemical nature of the cement. As very few people are willing to wait for a year or two before painting a cement surface, the best thing to do is to sponge the surface with a solution of twelve fluid ounces of oil of vitrol (concentrated sulphuric acid) in one gallon of soft water. This will neutralize any caustic lime present in the cemented surface and turn it into the inert sulphate of lime (gypsum) and also serves to roughen the surface sufficiently to give the paint a better hold. The surface should be well washed with clean water before priming. If the cemented surface is a month or two old the dilute acid wash may be dispensed with, and in its place a solution of two ounces of bicarbonate of ammonia to the gallon of water can be used, in which case the surface can be painted upon as soon as it is dry, although it is better to wait a short period of time.

After the above treatment has been given, in order to exclude moisture, the best plan is to prime with pure, well aged raw linseed oil, giving ample time to dry. This should be applied liberally, in order to stop suction, and then a coat of flat paint should be given, consisting of the pigments required to obtain the desired color, mixed with linseed oil, turpentine and japan drier. If this should dry out unevenly, a second coat must be applied. The work may be finished with any good oil paint or a finishing coat of a good waterproof, gloss enamel, may be given, made of good pigments and a good quality of exterior varnish. Such a treatment as this should keep out moisture effectually.

If the blocks have been self colored, and all that is desired is a wash that will keep out the moisture without materially changing the color, a wash should be applied to the surface consisting of one part of water glass (concentrated silicate of soda) to three parts of rain water. This will slightly darken the surface, but will give it a hardness that resists the weather and keeps out moisture.

PAINTING BRICKWORK

Brick walls may be painted in two ways; either to imitate the effect of pressed brick, or simply to give color with a gloss finish that will be effective in waterproofing the bricks.

If brick walls are to be painted with a gloss finish, four or more coats of oil paint may be used. The priming should be composed of white lead, mixed rather thin with raw linseed oil and a little drier. After puttying, a second coat of white lead paint, mixed a little stouter, should be given, and this should be followed by two additional coats, for which one part of zinc white to three parts of white lead are

recommended, although a first-class job may be made with pure white lead and linseed oil, using, of course, such tinting colors as may be desired. A first-class mixed paint may be substituted for the last two coats if desired, but in any case the first and second coats should be composed of white lead only.

Where it is desired to imitate a red pressed-brick wall, the priming coat should be Venetian red, ground in linseed oil and thinned with raw linseed oil and a little drier. This should be rubbed in well, and the work should then be thoroughly puttied up. For the second coat, one-fourth white lead and three-fourths Venetian red should be used, thinned with two parts of linseed oil and one part of turpentine with a small amount of drier. If a gloss finish is desired, the last coat should be made from Venetian red in oil, mixed with pure boiled linseed oil and a little drier. For a flat brick effect, less turpentine should be used in the second coat and the finish may be made of Venetian red thinned with brown japan and turpentine. If it should be glossy at first it will dry flat in a few weeks. However, it is better, for the final coat, to use one of the prepared flat brick reds made by most paint manufacturers. For other colored bricks, similar treatment is used, making the ground of the appropriate color and finishing with a flat brick color of the desired shade. The joints are afterward penciled in with white lead or lamp black, if the effect of white or black mortar joints is desired.

Selection of Wall Hangings

WALL TREATMENTS THAT ARE OUT OF THE COMMONPLACE—VARIOUS EFFECTS FOR DINING ROOM, BEDROOM, LIBRARY AND NURSERY

By Sidney Phillips

VERY often the attractiveness of the wall papers or the decorations sells a house, and everyone recognizes the fact that, when the wall papers are well chosen and the color scheme is attractive, even commonplace furniture looks better and an air of prosperity attaches to the whole house. Unfortunately many people, especially builders, know very little about wall papers, and when they select them, are

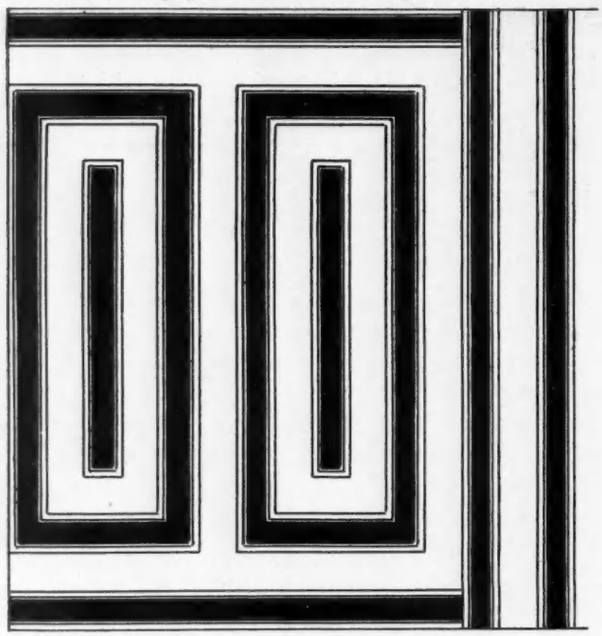


Figure 1

guided by the salesman, who prefers to sell the usual combinations of side wall, frieze and ceiling rather than to suggest something original which will give character and distinction to the house; and they are altogether too apt to choose showy papers rather than quiet and refined. The best decorators, in these days, very seldom use combinations, preferring to make them up to suit the room, and, indeed, many of the highest price wall papers are now made without friezes accompanying them, while many manufacturers make a specialty of separate friezes which can be used with plain

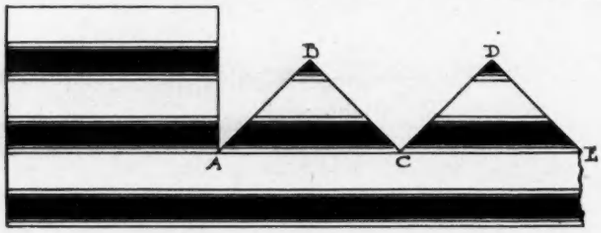


Figure 2

cartridge or ingrain papers, with grass cloths, burlaps or other fabrics, or with two-toned papers either in figures or stripes. Then again many rooms are decorated without friezes, an appropriate pattern being chosen to run from baseboard to the ceiling, using a picture moulding at the angle. This treatment is well adapted to low ceilings, and may either be used with plain or two-toned papers, in which the pattern is very indistinct, with cretonne effects in large florals, or with stripes. Some of the tapestry papers are well adapted to this treatment.

The two-thirds treatment, as it is called, is effective and offers many opportunities for originality. The lower portion of the wall, for about two-thirds its height, is hung with a plain paper, or with a two-toned stripe or a clothy effect in low tones, and this is capped with a picture moulding that should be colored to harmonize with the wall paper. The upper third is usually hung with a paper having a more pronounced pattern and brighter colors than the wall proper, for this upper third is above the furniture and the pictures and hence may properly be given a much more decorative treatment. For example, a bedroom might have a narrow stripe effect in two tones of green for

the lower portion, while a floral cretonne paper with red roses or poppies and green leaves against a white ground would be very effective for the upper third.

The lower portion of the wall, in the two-thirds decoration, is capable of original treatment, either by paneling or by the use of cut-outs from a figured paper so placed as to give a decorative effect.

A striped paper is well adapted to produce a paneled effect, and the method of doing it is much simpler by the paper hanger to get the miters true, which is easily done, for all wall paper is capable of shifting and stretching slightly.

Another pretty two-thirds treatment for a bedroom is made by taking a floral paper and by cutting the top of the breadths irregularly, so that the effect is given of flowers straggling above the general line. This is then used with an upper third of plain paper, the same color as the background of the floral. Of

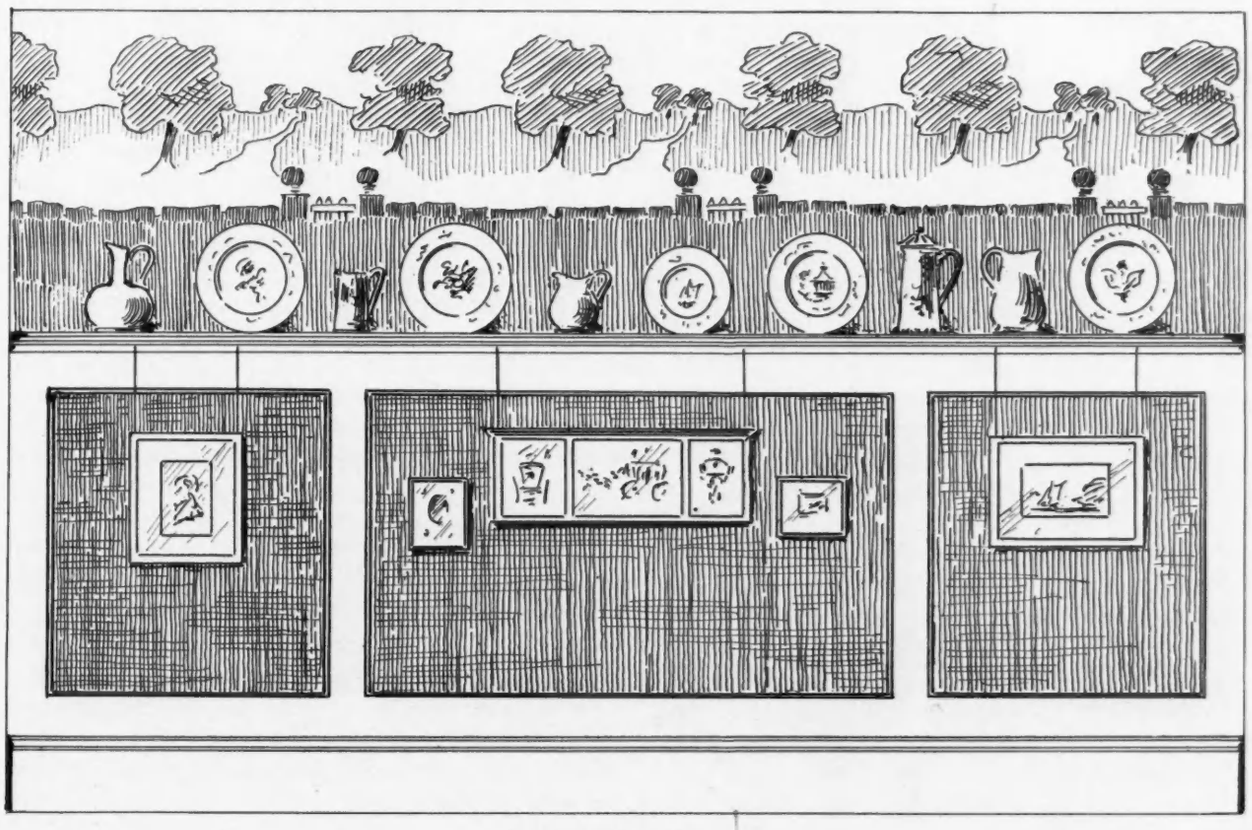


Figure 3

than where the panels require to be carefully laid out by the paper hanger. Fig. 1 illustrates an effect that may be produced by a striped paper to form a paneled dado, or the panels may run the whole height of the room. The paper is first hung as shown on the right, the breadths running vertically from the top line of the dado, which is usually capped by a picture moulding or by a chair or plate rail, down to the baseboard. The finished panels are shown on the left. These are made by taking a breadth of the paper, shown on the left of Fig. 2, and cutting it as indicated by the line A, B, C, D, E, in a saw-tooth pattern, the angles being exactly forty-five degrees. In this case, two stripes are left on the edge of the paper in order to form a top and bottom border to the pattern above and below the stiling of the panels, but there is only need for leaving one stripe, the base and cap being formed by the baseboard and the chair rail or picture moulding. The saw-tooth paper is hung over the paper that has already been hung, care being taken course the upper third in this case is hung first. Sometimes the floral will be used for the whole height of the side wall, and the cut-outs will run out on the ceiling.

Another odd treatment is to run two mouldings round the room, one about two feet below the ceiling and the other the same distance above the baseboard, the space between being occupied by a floral or a tapestry paper, while the upper and lower portions of the wall are hung with a striped paper.

In all of the above treatments the ceiling should be some plain tone, either white or a light tint. In an old house, where the ceiling is apt to be cracked and in bad condition, the irregularities can be concealed by using a moiré paper.

A pleasing dining-room effect is shown in Fig. 3. Here the lower portion of the wall is paneled, using either a plain tint or cartridge paper for the stiling, while the panels are filled with a grass cloth, a burlap or one of the clothy effects in two-toned figured paper

(the pattern usually being very small), which should be darker than the stiling. The joints should be covered with a narrow half-round or rope moulding. A combined plate rail and picture moulding supports such pottery as the owner desires to exhibit and serves as the base for the frieze, which in this case is intended to suggest one of the English pictorial friezes that are printed in low tones and in flat colors without shading and die away into a plain tint at the base that can be continued as far down the wall as desired. These picture friezes can be had in landscape and marine effects or in woodland scenes, well adapted for a library or dining room; in floral designs with landscape backgrounds, that would look well in bedrooms or sitting rooms, and in hunting scenes for dens as well as in pictured nursery rhymes or Noah's Ark animals that would delight the youngsters.

These latter designs are printed in poster colorings and are remarkably decorative. Some of our American manufacturers are also seeing the possibility of these picture friezes and are offering a number of very good and original designs. Doubtless the new season's showing will bring out many more of them.

In the higher priced papers there are, of course, many opportunities for original effects, but the medium grades of wall hangings, in the hands of a man who puts brains into his work, are just as capable of producing results that are new and out of the commonplace. Good taste and a recognition of the fact that cultivated people do not want gilt or other showy paper, but that they want refined and quiet colors that will be an appropriate background for themselves, their furnishings and their pictures, will enable any one, with the exercise of some ingenuity, to produce effects that are original, yet which one will not grow tired of.

The House Beautiful

So-called mission settles are now being offered in what resembles a sofa in shape, with broad arms at each end. This is not nearly so true to the type as the regular settle shape that has sides as high as the back, although some people prefer to have the comfort of these broad arms for reading. Advocates of the true mission settle declare that one should sit in a large chair to read and that a settle is for lounging or reclining. To properly rest one when reclining a settle should be six feet six inches long, to allow for the pillow.

An improved style of mission center table has a lower shelf instead of the cross-bars that were formerly used to stay it.

Dark and light green are far and away in the lead for window shades, with white quite a favorite, too. Sometimes the latter are adorned with one or two bars of insertion and fringe at the bottom.

While tan awnings are the most used, and certainly look well longest, many people, especially those with the exterior of their houses painted in Colonial effect, are using green and white stripes this year. The tendency is to broader stripes, particularly for porch use.

Narrow stripes in two-toned effects in tan and also narrow stripes of green and white and green and tan, the green not being too vivid, are among the popular stuffs for summer slip covers. Dainty flowered chintzes and dimities are also very fashionable among those desiring more exclusive ideas.

Among the handsomest summer portieres are some of French origin in a so-called "shadow" effect. These give a very light, indefinite, impressionistic effect, and consist of the hanging with a floral border and a valance to match that may be bought separately by the yard.

An artistic decorator said recently that where many people fail of effect in their arts and crafts decorative schemes is that they do not properly harmonize color effects in conjunction with the straight line environment. There must be a definite purpose in every room. No matter what room of the house it is, mission ideas can be successfully carried out. For instance, no room should be lighter and daintier than a nursery. If fresh, youthful coloring is employed and characteristic and appropriate accessories are used, even with the straight-line mission background, a nursery can be made to impress one at first glance as distinctly the child's room. And yet many people claim that mission effects are too heavy for any room but the living room or library. The exhibits at St. Louis this summer by foreign experts very truly disproved this.

It is said that "nature" rooms, such as are common in Japan, are a possibility of the future with us. In Japan they have the "autumn" room, the "summer" room, etc. An autumn room, for instance. over there, will have the walls showing the harvest moon in pale gold, dimly veiled by an autumnal mist set in a sky of changing mist. At the base will run a stream, on the banks of which are clusters in wild profusion of rich yellow and white chrysanthemums. The leaves of the trees are in autumn tints, flocks of wild geese appear to disappear in the distance and every detail suggests the season.

Best for the Advertiser

We are well pleased with the results from the AMERICAN CARPENTER AND BUILDER, and it is the best magazine we have yet done business with. More inquiries are coming to us from it than all others put together ,and we shall continue to advertise with you. —Hartwick Machinery Co., Jackson, Mich.

There is a walnut tree in Jackson county, Missouri, which is 7 feet in diameter 5 feet from the ground. It is thought to be the largest black walnut tree in the world.

RESIDENCES

Modern Practical Houses

HOMES WHICH MAY BE ERECTED AT MODERATE COST—DESIGNED FOR COMFORT AND CONVENIENCE—FLOOR PLANS AND DIMENSIONS GIVEN

THE houses illustrated this month are published with the idea of giving the carpenters and builders valuable suggestions in comfortably arranging a home.

House design on page 254 was recently erected at Seymour, Ill., and has proven to be not only very attractive but also very conveniently arranged. The entire house was built of cement, with a shingle roof. The interior is nicely finished with oak and a good heating plant was installed. The cellar which extends under the entire house affords ample space for furnace and fuel room. One of the commendable features of the interior arrangement is the large living room, with its fireplace and bay window. A place for books is also provided for and so can serve the purpose of a library. The bedrooms on the second floor are all provided with closets and the bathroom is conveniently located.

House design on page 255 has many features in the interior arrangement that are pleasing, and go far to make the home convenient and cheerful. The reception hall contains an open stairway of neat design and is connected with parlor by a wide opening. Between the parlor, living room and dining room are also wide openings with sliding doors, and if desired, these rooms can be opened up very effectively. The open fireplace in the living room and the sideboard in the dining room add considerable to the beauty of these rooms. A generous sized pantry and conveniently arranged kitchen are provided with suitable space for the necessary fixtures and a combination rear entrance and cellar way. On the second floor are five good-sized rooms, also bath room, plenty of closets and rear stairway. If necessary, three rooms could be finished in attic. The cellar is large and is partitioned off into laundry, furnace room and vegetable room. This would make a very desirable house for a fifty-foot lot, as the building proper is 27 by 45 feet. The exterior is handsome in design and would be a credit to any locality.

EDITOR'S NOTE.—We publish under the above heading illustrations and floor plans of low and medium-priced practical residences. These plans are not for sale, but are published solely for the purpose of giving ideas and useful information to architects, carpenters, builders and all others who may be interested in building a home.

House design on page 256 is a home which is a credit to anyone. It was built for a large family, and has succeeded in comfortably taking care of them. The large porch with its Corinthian pillars gives the entire house a stately appearance besides affording great convenience to the occupants.

The interior arrangement is such as to make use of all possible space. Here also the sitting room, which is in other words, the living room, is the pleasantest room in the house, as it is the place where the family spend most of their time while at home. The five bedrooms on the second floor are all amply large and connected directly to the hall, which has two stairways to the first floor.

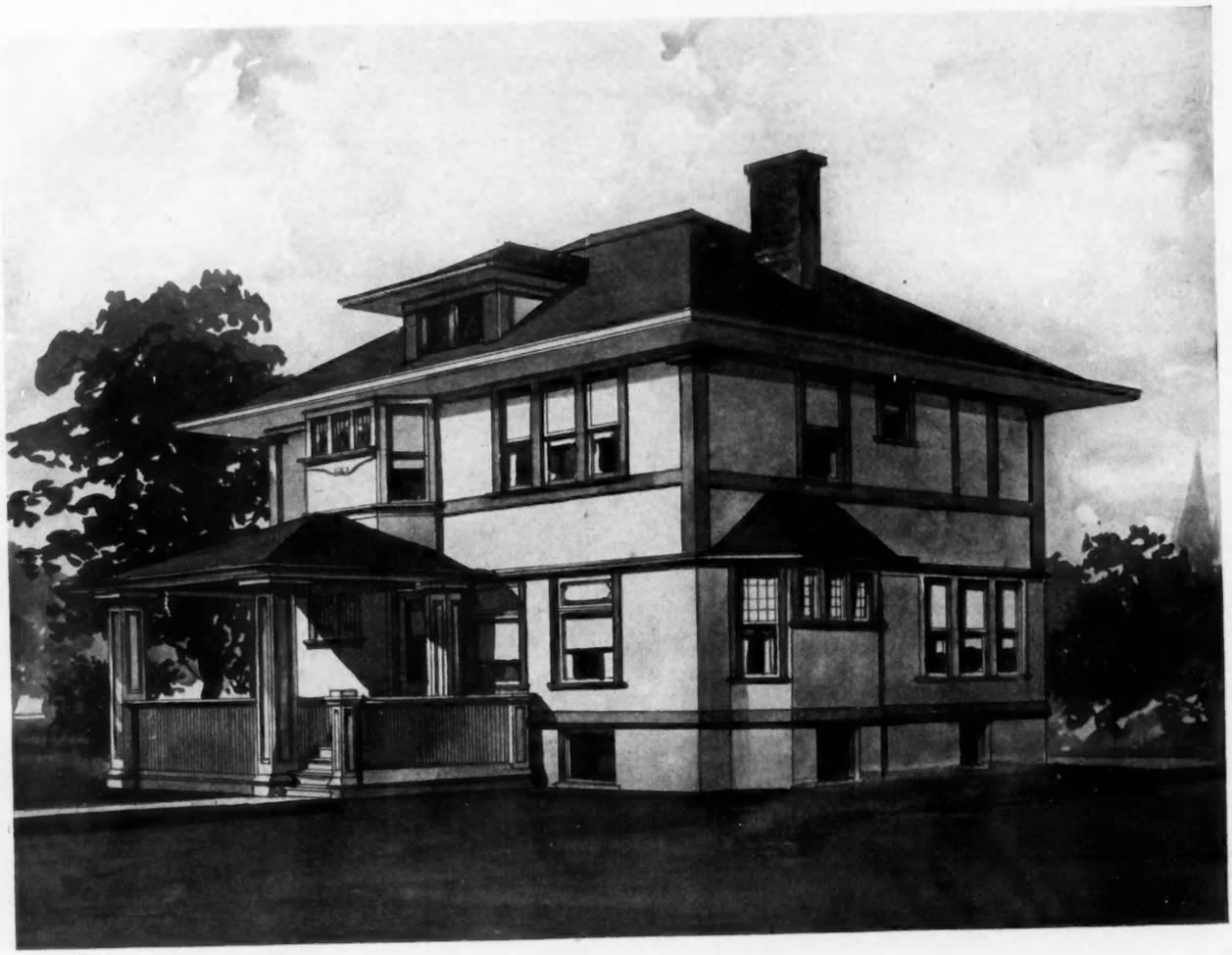
Put a Roof on the Wrong House

A story comes from Louisville, Ky., of a contractor who received a contract for a new roof on a church in that city, and who in his haste to get the work done roofed the wrong structure. This has been equaled in New York by a German builder who erected an apartment-house on the wrong lot. It was in the suburbs and in a semi-detached character, so the thrifty Teuton thought he would save the surveyor's fee, as his house kept well away from the lot line and there was no danger of encroaching upon his neighbor. When he got his roof on he applied to a well-known financial institution for a loan. The bank promptly sent a surveyor, who surprised the old builder by telling him that he had built on the wrong side of the street. Fortunately the owner of the lot was a reasonable individual, so he swapped with the builder, who paid several hundred dollars bonus for the privilege. Hereafter he will employ a surveyor.

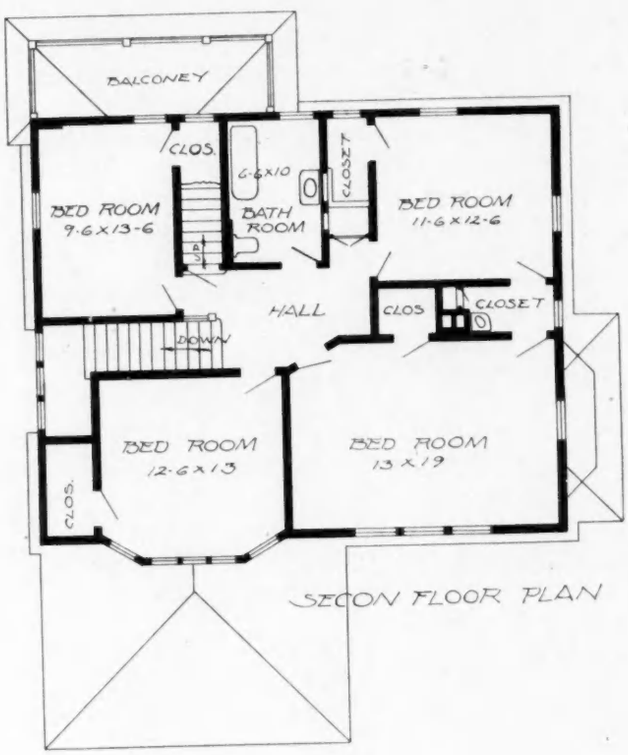
Not Surprised

I am glad but not surprised at your success. Merit, coupled with push, does not generally fail.—P. J. Bergeim, Brookings, S.D.

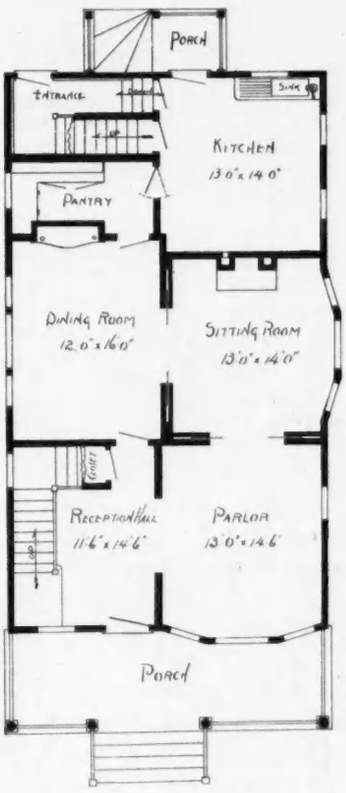
Idaho is said to be the only state that now contains a solid body of pine similar to the white pine of the central northern states. It is a very large tract, and is owned practically by six extensive lumber companies.

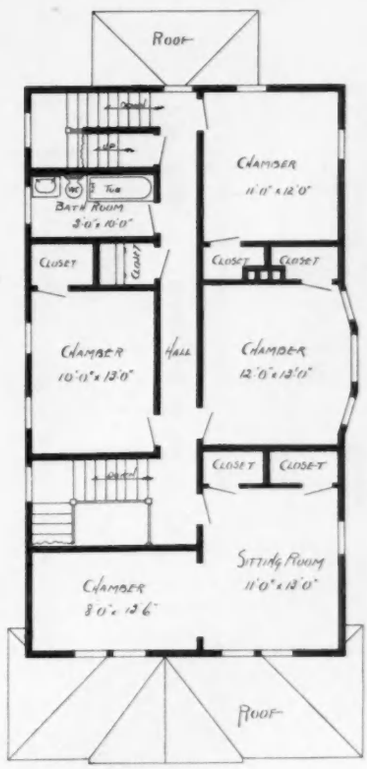


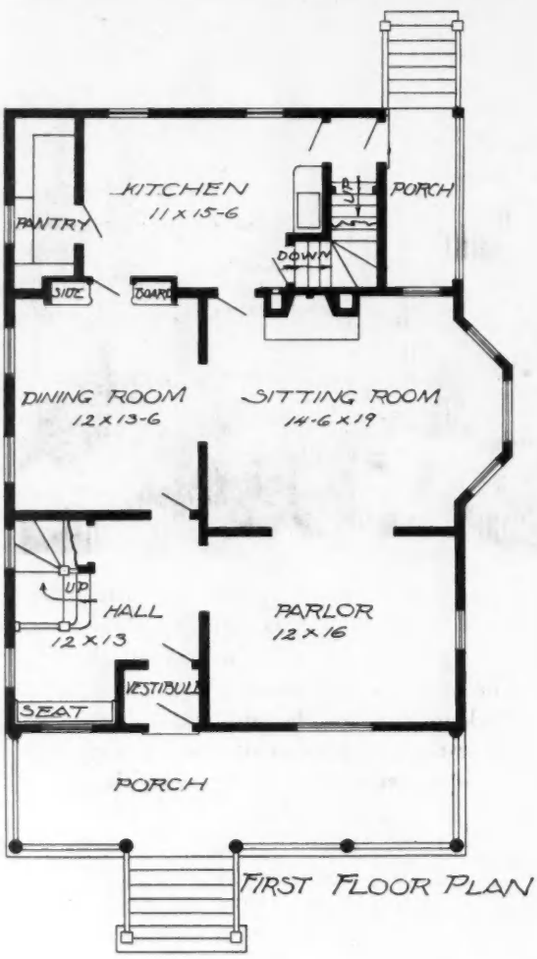
FIRST FLOOR PLAN



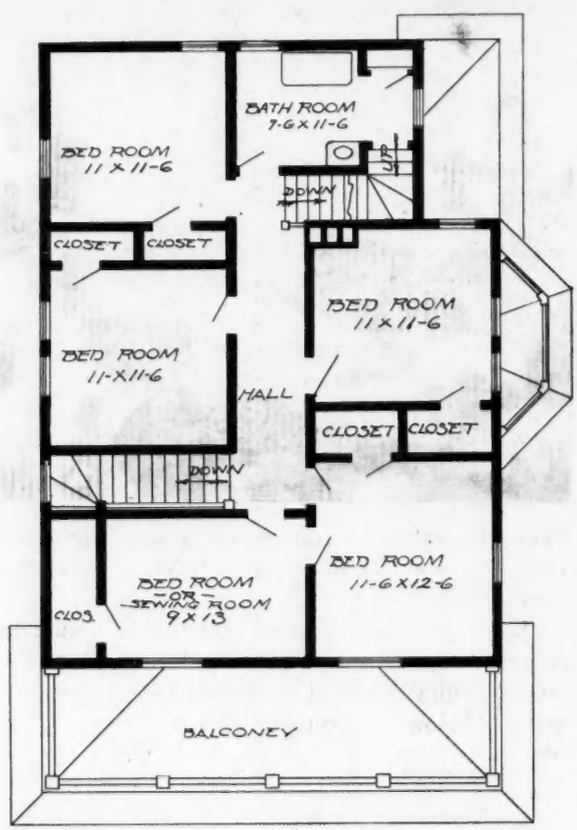
SECON FLOOR PLAN


PORCH
ENTRANCE
SINK
KITCHEN
13'0" x 14'0"
PANTRY
DINING ROOM
12'0" x 16'0"
SITTING ROOM
13'0" x 14'0"
CLOSET
RECEPTION HALL
11'6" x 14'6"
PARLOR
13'0" x 14'6"
PORCH


ROOF
CHAMBER
11'0" x 12'0"
BATH ROOM
5'0" x 10'0"
TUB
CLOSET
CLOSET
CLOSET
CLOSET
CHAMBER
10'0" x 13'0"
HALL
CHAMBER
12'0" x 13'0"
CLOSET
CLOSET
SITTING ROOM
11'0" x 12'0"
CHAMBER
8'0" x 13'6"
ROOF



FIRST FLOOR PLAN



SECOND FLOOR PLAN

FARM BUILDINGS

HENRY H. NIEMANN

A Model Chicken House

A COMPLETE DESCRIPTION SHOWING THE ARRANGEMENT AND CONSTRUCTION OF THE VARIOUS PARTS OF THE BUILDING—ALSO AN ILLUSTRATION OF A HORSE AND COW BARN GIVING FULL DETAILS

IN THE June issue we illustrated a bird's-eye view of farm buildings built on Geo. B. Robbins' farm near Hinsdale, Ill. Its intention was to show the scheme of grouping the buildings to the best advantage, for their various purposes.

Beginning with this article we will write a more detailed description of each of these buildings; taking them in rotation as the numbers appeared on the bird's-eye view we will begin with No. 1, which is the chicken house.

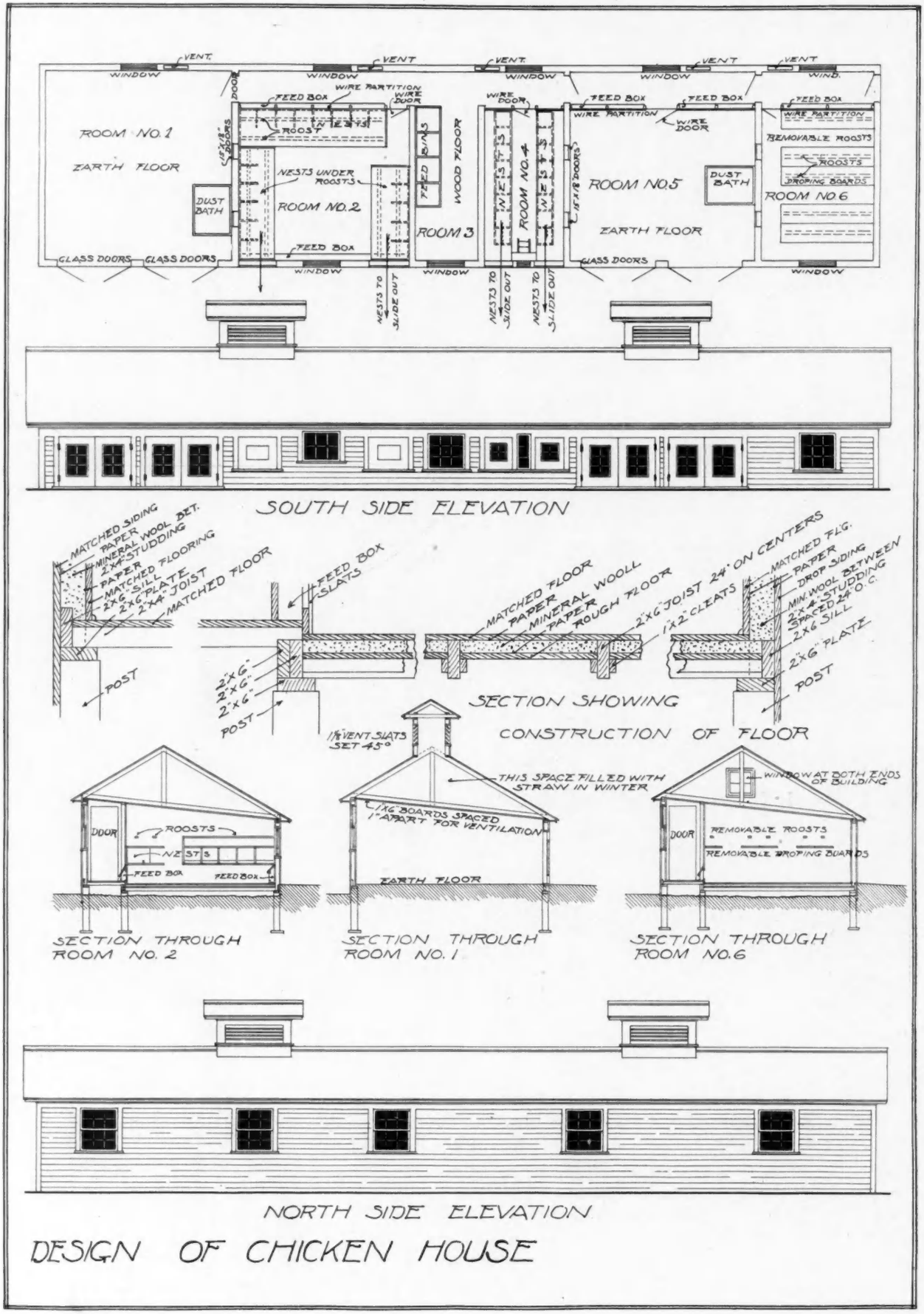
This building is 68 feet long and 16 feet wide, built on a post foundation, which is enclosed with planking covered with galvanized wire cloth to a depth of about two feet below the ground, to check the tunneling of rats, etc.

Almost every lover of poultry has his own ideas as to how the model chicken house should be arranged and constructed, and every chicken house that is not thus constructed may meet with his severe criticism. We will, therefore, not lay stress on any one particular feature of this building but will say that several different ideas have been used which may be explained as follows:

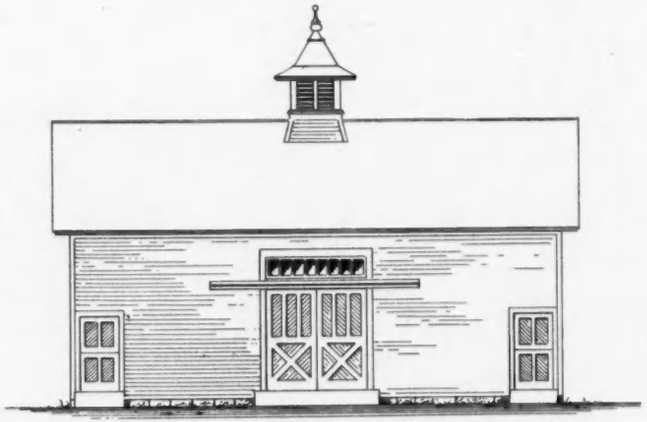
Rooms Nos. 1 and 2 (see floor plan) are used together; room 1 being the scratching room which is used in stormy and winter weather for exercise, and room No. 2 is the feed, nest and roost-room.

The roosts are placed above the nests which have a cover, or roof, pitched so the chickens cannot roost on the nest, but are compelled to get on the roost above. The nests are open in front, having a passage for the chickens, running the full length of each section. The nest sections are removable through doors opposite each section, so they can be easily cleaned and aired; they set on a rack which elevates them about twenty inches above the floor, so the chickens can walk below them where the feed troughs are located, as shown in the section through room No. 2.

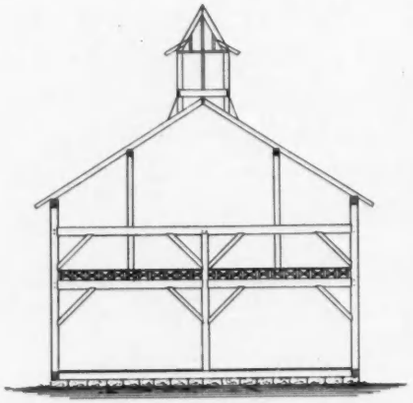
Room No. 3 is a feed room, 5 feet wide, which contains feed bins for grain, meal, etc. To the right


VENT.
WINDOW
DOOR
WIRE PARTITION
WIRE DOOR
FEED BOX
ROOST
NESTS
ROOM NO.1
EARTH FLOOR
DUST BATH
NESTS UNDER ROOSTS
ROOM NO.2
FEED BOARDS
WOOD FLOOR
ROOM 3
ROOM NO.4
ROOM NO.5
REMOVABLE ROOSTS
DROPING BOARDS
ROOM NO.6
GLASS DOORS
NESTS TO SLIDE OUT
SOUTH SIDE ELEVATION
MATCHED SIDING
PAPER
MINERAL WOOL BET.
2"x4" STUDDING
MATCHED FLOORING
2"x6" SILL
2"x6" PLATE
2"x4" JOIST
MATCHED FLOOR
POST
SLATS
2"x6"
MINERAL WOOLL
ROUGH FLOOR
2"x6" JOIST 24" ON CENTERS
1"x2" CLEATS
MATCHED FL'G.
DROP SIDING
MIN. WOOL BTWEEN
2"x4" STUDDING SPACED 24" O.C.
SECTION SHOWING CONSTRUCTION OF FLOOR
1/4" VENT. SLATS SET 45°
THIS SPACE FILLED WITH STRAW IN WINTER
1"x6" BOARDS SPACED 1" APART FOR VENTILATION
EARTH FLOOR
WINDOW AT BOTH ENDS OF BUILDING
SECTION THROUGH ROOM NO. 2
SECTION THROUGH ROOM NO. 1
SECTION THROUGH ROOM NO.6
NORTH SIDE ELEVATION
DESIGN OF CHICKEN HOUSE

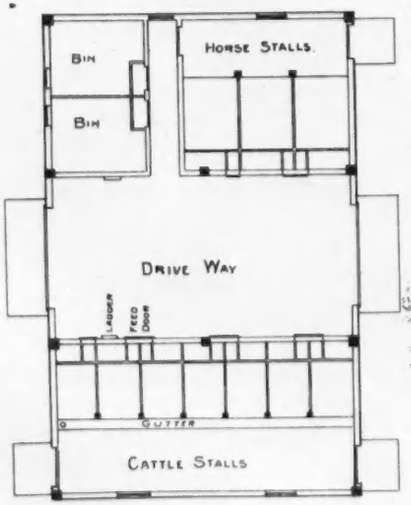
END ELEVATION



SIDE SECTION

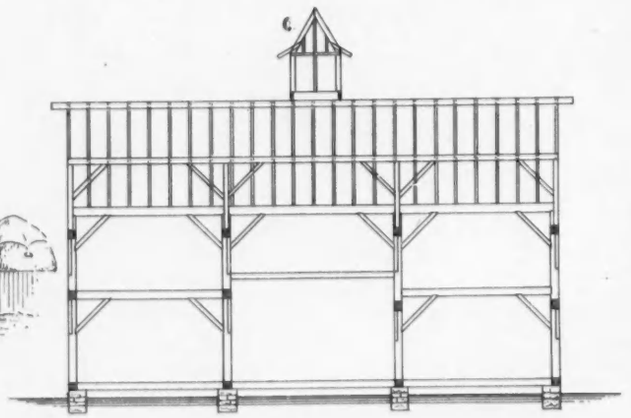


END SECTION.



FLOOR PLAN

PERSPECTIVE VIEW.



SIDE SECTION THROUGH CENTER.

(east) of this feed room are rooms 4, 5 and 6. In this scheme, the nest room, 4, is separated from the roost room, 6, one being to the west and the other to the east of the scratching rooms. This may have several advantages over the idea of room 1 and 2 where the chickens roost and lay in the same room, but it also has some disadvantages, one of which is, that a larger building is required for the same number of fowls.

The nests of room 4 are so constructed that each nest can be taken out separately, or each entire section can be taken out through doors the same as in room 2. In place of the chicken being in view while on the nest, in room 4 the opening of the nests face the wall, having a dark passage for the chickens. By being out of view they are not frightened while the eggs are being gathered, which is done through a small, round hand-hole through the back of the nest. This is covered by a small wooden shutter loosely screwed on over the hand-hole so it will always hang closed. Feed boxes similar to those in room 2, are located along the hallway adjacent to rooms 5 and 6.

Rooms 1 and 5 have earth floors and boxes filled with dust, for dust baths. All other floors are constructed double, with two inches of mineral wool between them for warmth, as shown in the section. All side walls of the building have heavy building paper both inside and outside of the studding, and the space between is also filled with mineral wool.

The space between the ceiling and roof is filled with straw during the winter months, and the ceiling boards are spaced half an inch apart to allow a free circulation of air through the ceiling and straw. This is brought about by having windows at each end of the building, which are controlled by cords. All windows on the north have storm sash for winter. Ventilation shafts are built in the north wall, with slide shutters for admitting fresh air and exhausting foul air in winter, when all windows are kept closed.

HORSE AND COW BARN

The accompanying cut illustrates a horse and cattle barn which is very conveniently arranged and suitable for a small farm. It is designed to accommodate seven cows and three horses, besides having storage room for about thirty tons of hay and large grain bins.

The middle driveway has a width of 16 feet and answers for the shelter of small vehicles as well as a feeding room for the stock. The doors are large enough to easily admit a load of hay, which is hoisted through a trap door above the drive and stored to right and left. The barn is constructed of braced timber having 8 by 8-inch timbers at all corners and under girders, well braced with 4 by 6-inch braces. The panels between the posts are filled in with 2 by 4-inch studding, set 2 feet apart for sheathing and siding. This construction is very durable and well braced to resist heavy winds, besides being very simple and economical.

Eight Room School House

A WELL EQUIPPED SCHOOL WITH GOOD INTERIOR ARRANGEMENT - THE BEST METHOD OF VENTILATING SMALL SCHOOLS THROUGHOUT THE COUNTRY

THE accompanying illustration shows the large eight-room school located at Berwyn, Ill. It is constructed of brick with heavy stone foundation, and covered with a slate roof. A large basement, which extends under the entire building, is equipped with boys' and girls' play-rooms, toilet rooms, furnace and fuel rooms.

The first floor has four large rooms, which are well lighted and ventilated, and each room has two exits into the hall.

The hat and coat racks consist of screens with hooks attached, being more sanitary and also enabling the teacher to see everything going on in the cloak room. At either end of the hall is a drinking fountain, which is a great convenience to both teachers and students. The second floor has a similar arrangement throughout, with the exception of having a room for the teachers, thus affording them greater privacy.

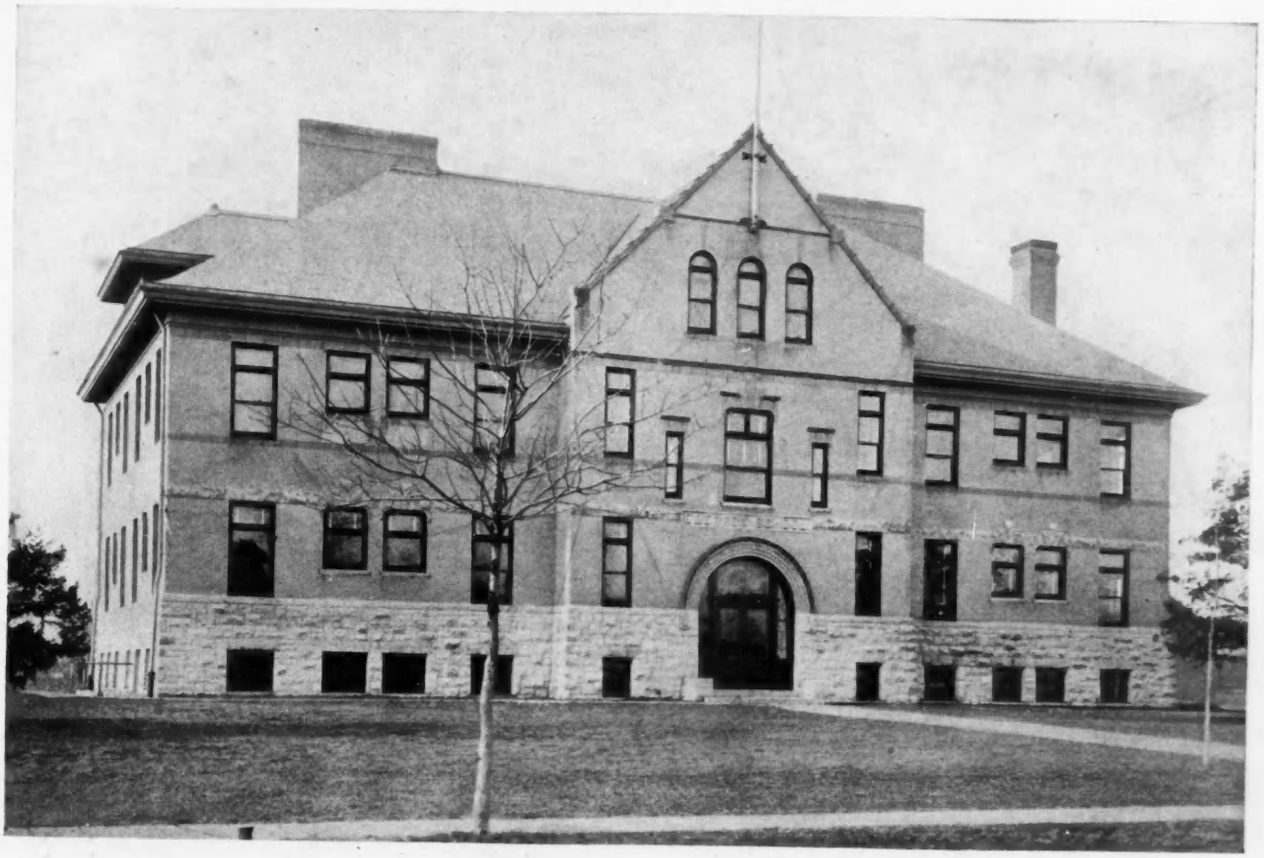
VENTILATION IN SCHOOLS

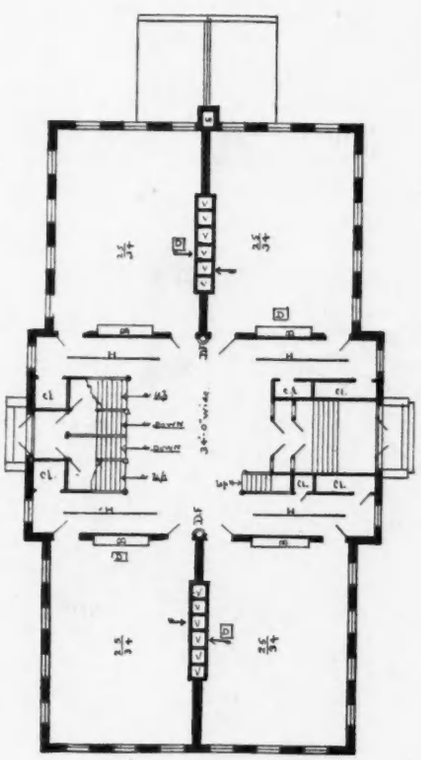
The subject of ventilation is one of the most vital ones in school work, for bad air is a menace to the health of the students. The modern schools are not defective in this respect, for it has been thoroughly impressed on the minds of most school boards that ventilation is just as important as heating.

The great trouble is in the smaller schools throughout the country where the room is heated by means of a stove and ventilated by the windows. In these schools it is not so difficult to ventilate in summer when the windows can be opened, but as the greater part of the school year is during the colder weather the problem is, how to keep the air in the room pure without causing a severe draft.

The windows should never be opened from the bottom so the cold air will strike the heads of the children, as that would cause greater evil than if the children did not go to school at all.

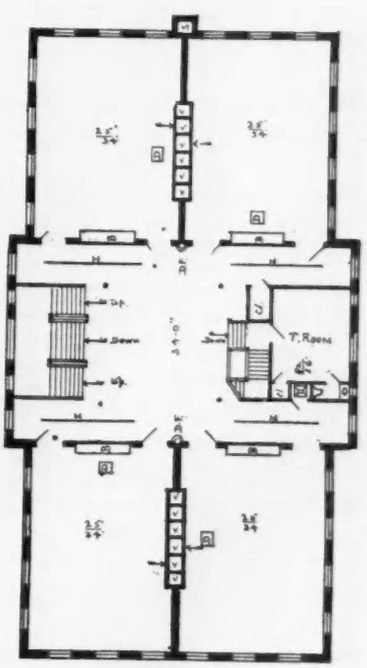
The method very successfully used in many schools, and under the conditions a very good one, is to get a board as long as the width of the window and about six or eight inches wide and place this on the sill of the window and pull the window down till it touches it. The window is then open six or eight inches, but on account of the board no draft is created, but where the upper and lower windows meet there is a space of several inches through which fresh air comes in, and instead of striking the heads of the children in a cold condition, it is forced to the ceiling, and when it reaches the children it has lost none of its purity and is so warm as to be harmless.





FIRST AND SECOND FLOOR PLAN
of EIGHT ROOM SCHOOL
BERWYN-ILL.

D Teachers Desk.
B-Book Cases—
H-Hat and Coats—
DF Drinking Fount
Twins V. Vents—



MANUAL TRAINING

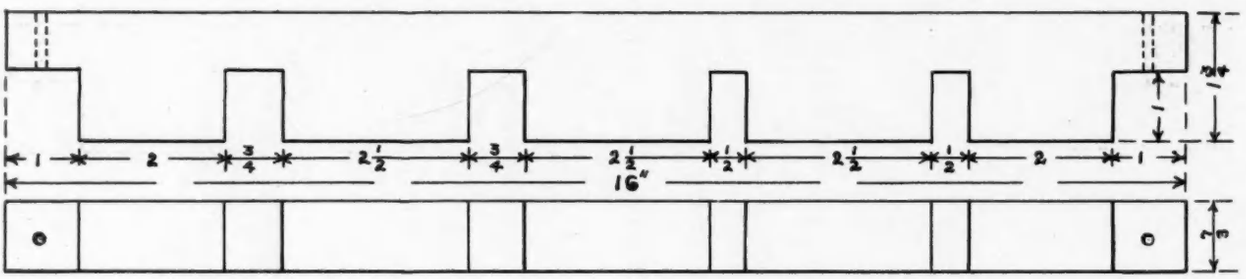
IRA S. GRIFFITH

Making a Hall Tree

HOW TO PROPERLY USE AND SHARPEN A CHISEL—MAKING A CHISEL-RACK TO TAKE CARE OF TOOLS—HOW TO MAKE USEFUL THINGS ABOUT THE HOUSE

HAVING become familiar with the use of the plane in squaring up a piece of rough stock, the beginners are ready to learn the use of some other common tool.

It is quite likely a rack is needed for the chisels, so placed that they may be easily reached when wanted. The chisel-rack which will be described, can be nailed or screwed up on the wall above your bench. By keeping the chisels on this rack when they are not in use, the edges are less likely to become nicked and dulled, besides giving room on the bench for other things.



The length of the rack is sixteen inches, the width one and three-quarter inches and the thickness seven-eighths of an inch.

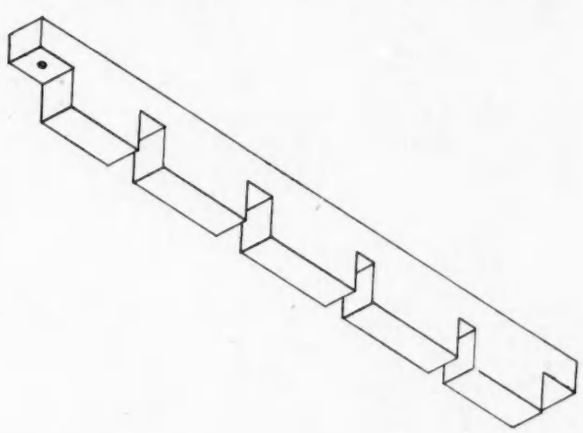
According to the directions given last month, square up the stock to these dimensions.

With the knife-point or a well sharpened pencil, try-square and rule lay out the grooves. Beginning at one end of the piece, mark off on the joint-edge a point one inch from the end; then, without taking up the rule, mark off a point two inches from this one; next, three-quarters of an inch; two and one-half inches; three-quarter of an inch; two and one-half inches; one-half an inch; two and one-half inches; one-half an inch, and finally two inches. If the measuring has been accurately done and the piece was of the correct length, the last point ought to be one inch from the end nearest it.

Beginners are prone in a problem of this kind to pick up the rule every time a point is marked because it seems an easier way of measuring. This should not be done, as every time the rule is picked up, the accuracy is decreased.

Carpenters often do, what to beginners might seem extra work, just to avoid such little inaccuracies, which soon grow to be big ones. Watch them marking off rafters, joists, or studding, where there are to be quite a number of pieces of the same kind. They make one as it should be and carefully mark it so they can distinguish it from all others that are to be made. From this one as a pattern all others are marked. For, should they use first one as a pattern, then the next, and so on, they would find no two alike. The greatest difference being between the last one cut and the first.

Place the beam of the try-square against the working face and the blade so that its edge touches one of these marks, and square a line across the joint-edge. Repeat at each of the points. Now place the try-square against the joint-edge and the blade so that it touches one of the lines just made across the joint-edge and continue



this line first on one side then on the other and repeat at every line squared across the joint-edge.

If the knife point is used in making these marks, care

should be taken to make the lines no longer than is needed.

Set the gauge to one inch. Keeping the gauge-block against the joint-edge, gauge lines to indicate the depth of the cut; first, on one side of the piece, then on the other. Do not gauge beyond the lines which mark the width of the part to be removed.

The easiest way to remove the wood from the places which are to hold the chisels, would be to place the

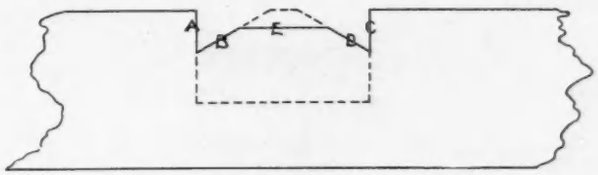


FIG. 1.

stick on the edge opposite the joint-edge and make the vertical cuts with the saw. As the saw is not the easiest tool to use accurately; and, as you will need to learn the use of the chisel, I shall tell you how to remove the wood by means of the chisel alone.

There are two classes of chisels. One class, the framing chisels, are strong and heavy and have their handles fitted into sockets. The tops of the handles are usually bound with iron or leather to enable them

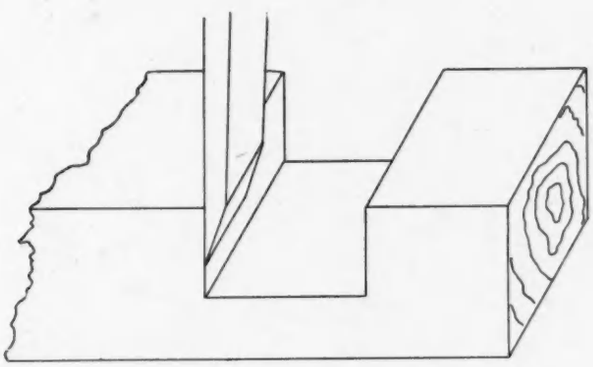


FIG. 2.

to withstand the heavy blows of the mallet. The second class, the firmer chisels, are lighter, and are for finer work where pounding is not required. The firmer chisel should be used in making the chisel-rack.

Since the chisel cuts by pressure alone, it is absolutely necessary for good work that it be well sharpened. If your chisel is not sharp, it can be put in order by the use of the oil or whetstone. If the edge is nicked or has become blunt by repeated whettings the grindstone must first be used.

To whet the chisel, hold the handle with the right hand, press down on the blade with the fingers of the left hand; and, keeping the bevel of the chisel flat on the stone, give it a backward and forward movement. Some carpenters prefer to give it a circular movement on the face of the stone. Whichever way is used, care should be taken to keep the bevel flat on the stone at all times, otherwise a curved edge instead of a flat one is formed.

An easy way to tell when the bevel is flat on the stone, without stooping down to see, is to rest the blade of the chisel on the stone with the bevel side down; raise the handle, keeping the bevel on the stone, until the oil spurts from under the cutting edge. This can be done quickly and should be done frequently during the whetting. Should the handle be held too high, an extra bevel is formed, and if held too low the whetting does not reach the cutting edge at all.

The wire edge which is formed by the rubbing, may be removed ordinarily by holding the handle of the chisel a little higher than the edge, and pushing the

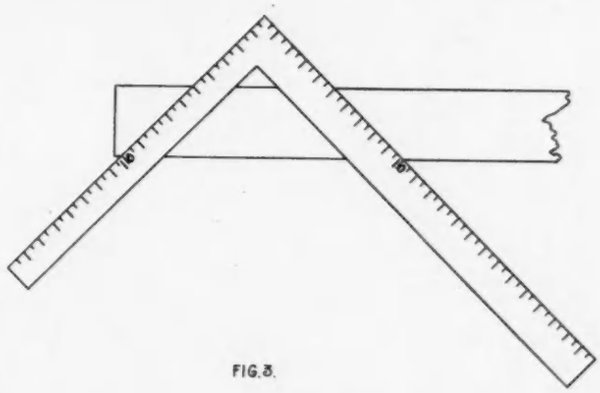


FIG. 3.

chisel forward, face downward on the stone. One stroke will usually suffice. If this does not remove it, draw the cutting edge across the end of a piece of wood.

When the chisel has been properly sharpened, place the piece of wood in the vise, or clamp it to the bench, with the side opposite the joint-edge down. Selecting a chisel which is just wide enough to make the horizontal cut without binding, begin by making the vertical cut, Fig. 1, A.

Grasp the handle of the chisel in the right hand, guide the blade with the fingers of the left hand. Always keep both hands back of the cutting edge.

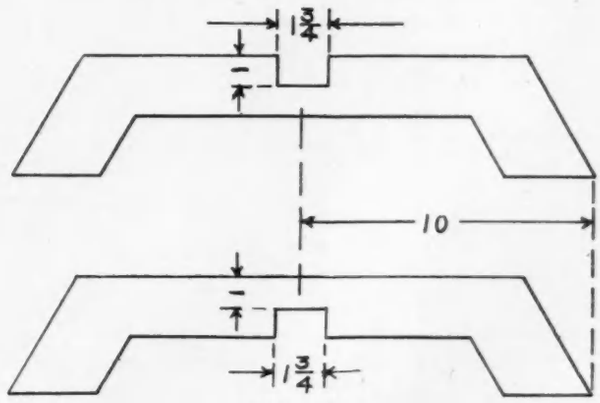


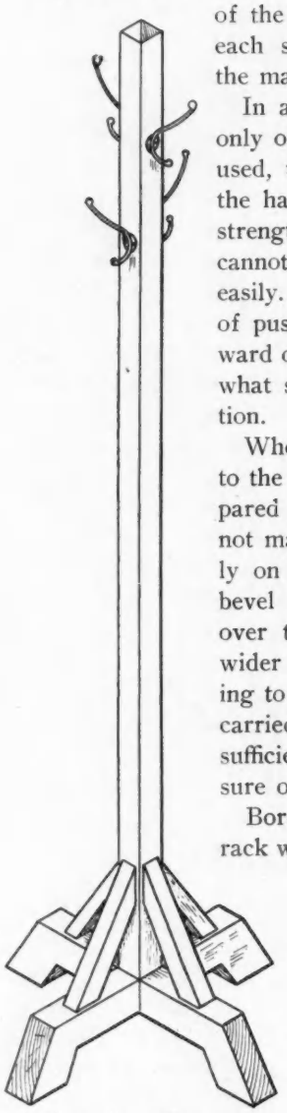
FIG. 4.

Keep the face side of the chisel, or that side which does not have the bevel, next to the line to which you

are working, Fig. 2, and make the vertical cuts about a thirty-second of an inch inside of the line.

With the bevel side down make the oblique cut, Fig. 1, B. After cutting down this side, reverse the chisel so as to have the face next the other line and make the vertical cut, Fig. 1, C. Next, make the oblique cut, Fig. 1, D.

The horizontal cut should be made with the face of the chisel down, working from each side alternately when near the mark.



In all chiseling, a small portion only of the cutting edge should be used, the amount depending upon the hardness of the wood and the strength of the worker. Good work cannot be done unless one works easily. Whenever possible instead of pushing the chisel straight forward or downward, incline it somewhat so as to secure a paring action.

When the groove has been cut to the right depth, the sides can be pared to the lines. The reason for not making the vertical cut directly on the line at first is that the bevel invariably forces the chisel over the line, making the groove wider than it should be. This paring to the line can be, and often is, carried on as soon as the wood is sufficiently removed to avoid pressure on the bevel.

Bore the holes in the ends of the rack with a one-eighth inch bit. In boring, sight the brace for plumb by looking first from one direction, then from a direction at right angles to this. Repeat this change of direction frequently as the boring proceeds.

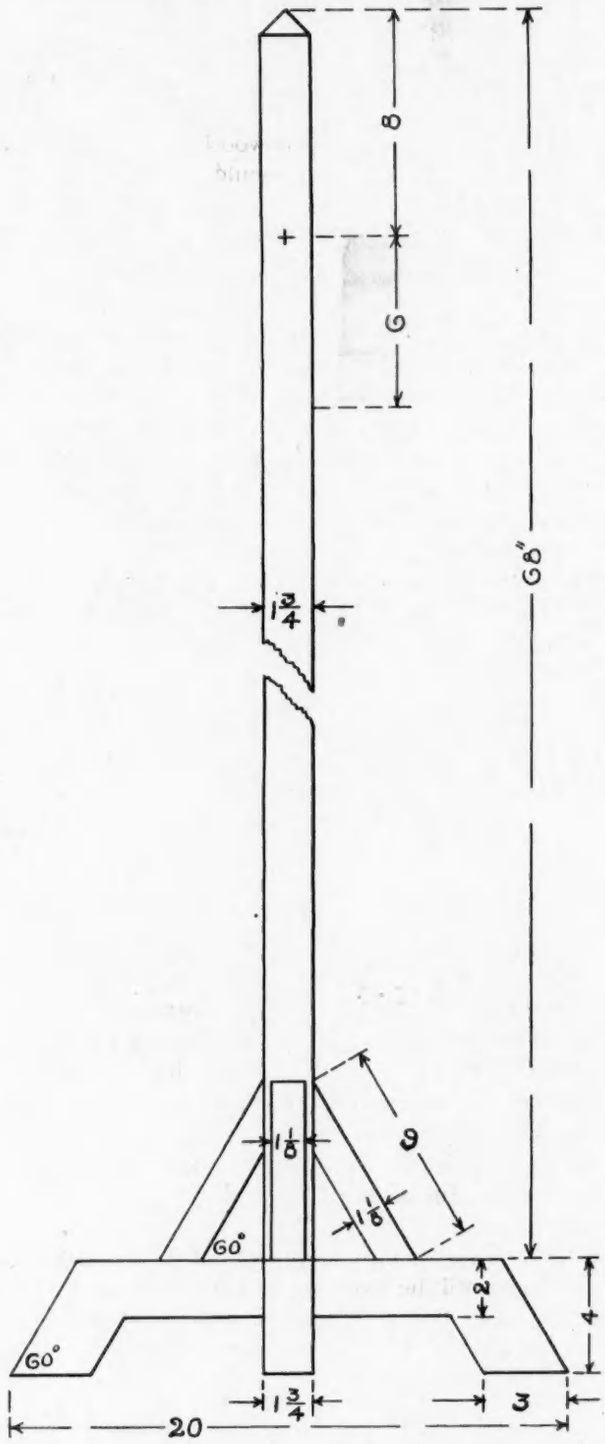
Sandpaper the sides by placing the paper around a block. Be careful not to allow the sandpaper to ruin the sharp edges. Do not sandpaper the grooves. Sandpapering cannot improve a joint and will most certainly round off the edges; the sign of a poor workman.

HALL TREE

The hall tree, the description of which follows, has been found to be a very convenient piece of furniture to have about the house. It can be used in the hall, and is especially adapted to a small hall as it takes but little floor space; or it can be placed in the bedroom upon which to hang one's clothes at night. In fact it would be found useful in any room of the house.

It can be made of soft or hard wood. The finish which is given for it will look equally well on either.

Stock, one and three-quarters inch thick, dressed on



two sides, will be found to work up economically.

First, square up a piece on four sides to one and three-quarter inches each way. Square off one end and measure the length, sixty-eight inches. Miter the top to an angle of forty-five degrees from every side.

To obtain this angle, place the square as in Fig. 3. Any other number would have done, the only requirement being that the number on the blade next the edge

of the wood shall be the same as that on the tongue. If you have the May number of the AMERICAN CARPENTER AND BUILDER, read the article on the Steel Square by Alfred W. Woods.

The most convenient way to cut these angles is in the miter-box. All miter-boxes have the angle of forty-five degrees, as it is the most common in use by carpenters after the right angle.

Next, from the same stock, rip two pieces for the base. They should be a little over twenty inches long by a little over four inches wide. Square up the four sides of each. Set the bevel to an angle of sixty degrees as described last month in making the taboret. Measure off twenty inches on the edge opposite the joint-edge; and, placing the beam of the bevel against the joint-edge and the blade at each of the marks just made, successively mark the slope at which the ends are to be cut; first, on one side, then on the other.

It will be well to square the lines across the edge opposite the joint-edge to see how accurately the marking has been done. The lines ought to meet.

Measure back from each end three inches, and mark the slope of sixty degrees as before. Set the gauge to two inches and gauge on each side, being careful to keep the gauge mark wholly between the lines just drawn.

That part of the bars which is to be cut out can most easily be removed by boring a hole on the waste wood near the point where the gauge mark meets the sloping mark and starting the cut with the keyhole saw. Saw along the slopes and use the chisel and scraper to smooth up the surfaces.

The braces are to be squared up on four sides to one and one-eighth inches each way. There are to be four of them. One end of every piece is to be marked around with bevel and try-square at a slope of sixty degrees and the other to thirty degrees. The angle of thirty degrees can be got by drawing on a board with the bevel the angle of sixty degrees, and then through the same vertex, drawing an angle of ninety degrees with the steel square. The two lines drawn form the sides of the required angle. These braces are to be nine inches long from long point to long point.

Thoroughly scrape all pieces but do not sandpaper the base until the cross-lap joint has been made.

To make this joint, Fig. 4, square two knife lines across the upper side of the pieces, which are to form the base, seven-eighths of an inch each side of the middle; or, so that the lines shall be one and three-quarter inches apart. Continue these lines on each side to one-half the distance across the stick. Set the gauge to one inch and gauge between these lines, gauging from the joint-edge, the upper side. The other bar is laid out similarly from the under side. The gauging, however, is done from the upper side.

Sandpaper all pieces well. Put the cross bars together and bore a three-eighths inch hole at the center of their intersection. Bore a one-quarter inch hole in the end of the upright, or standard, two inches deep. Fasten these pieces together with a lag screw four inches long by three-eighths of an inch in diameter. Put the braces in place, planning wherever necessary to make a good fit.

The braces can be put on with nails. A better way, however, would be to use screws, boring a hole large enough to let the head sink in a little and plugging this hole with a close-fitting dowel rounded off to make an ornamental button.

Care must be taken to have the upright at right angles to the base. Use the square to test while fastening the braces.

The hooks look best when placed in pairs, the first pair being placed eight inches from the top and the other six inches below this pair. They should not be put in place until all finishing has been done.

Black Flemish makes an appropriate finish for this piece. It can be bought ready to apply.

Concrete for Farm Uses

In many sections concrete buildings are being constructed on farms, and that they are likely to be desirable is probable, just as soon as builders have a little more experience in constructing them. At present it is safer to confine one's operations in concrete to floors and that there ought to be more concrete floors in farm buildings there is no doubt. They may be quite expensive in the first cost, but they are the cheapest floors in the end if properly constructed. There need be no elaborate selection of material, simply the best cement, sharp sand (not sandy soil) and small, sharp stones in the proper quantity.

The foundation ground should be hard and level. Then make the mixture of sand and cement three parts of sand to one part of cement, stirring the mass thoroughly until it is uniform in color. It is important that the sand and cement be thoroughly mixed. Then supply the stones and mix all again, doing it thoroughly. There should be about five times the bulk of the cement in stones; the mass should be well wetted, so that it will readily slide off the shovel when placed in position. Then fix a tamper, having it fully ten inches wide each way, a board nailed on the end of a three by three strip makes a good tamp, and pound the mass until the water appears evenly on the surface. Be careful in going over it the last time and get it as level as desird. Let the mass dry for from three to five days and the job is done.

Sorry it is Not a Weekly

I like your paper and am only sorry it is not issued every week. My time is well spent in studying it.—F. R. Marrs, Minot, N. D.

The Best Ever

Your journal is the very best ever.—J. H. McMillan, Milledgeville, Ga.

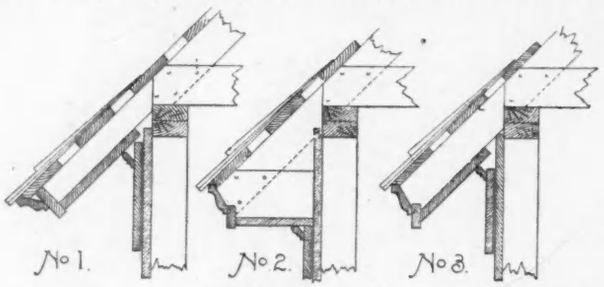
Correspondence.

How to Join the Crown Mould

To the Editor: Geneva, Minn.

I wish you would tell me the best way to shingle a hip or valley. Also where two roofs come together with a valley, do you cut the ends at the rafters square or plumb with the building? F. E. BILLS.

Answer: The first question as to the best way of shingling hips and valleys we refer to the answer of Mr. Lewis's question. If it is a cornice like No. 1 it is proper to cut the ends



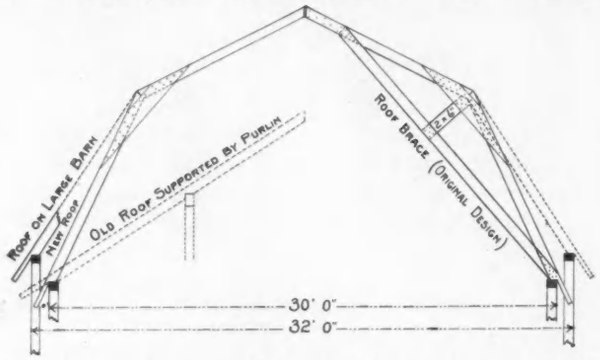
at the rafters square, but if it is a box cornice like No. 2, then the crown mould should set plumb. A cornice like No. 3 will not work well where there are gables, because the crown mould will not member with that of the gable.

A. W. WOODS.

Brace for Gambrel Roof

To the Editor: Holley, N. Y.

The accompanying cut illustrates a brace for gambrel roof to be used instead of the purlin support. There are two barns of different widths and heights joined end to end. The larger barn is thirty-two by fifty feet, with regular gambrel roof. The horse-barn, which is joined on, had an old fashioned one-



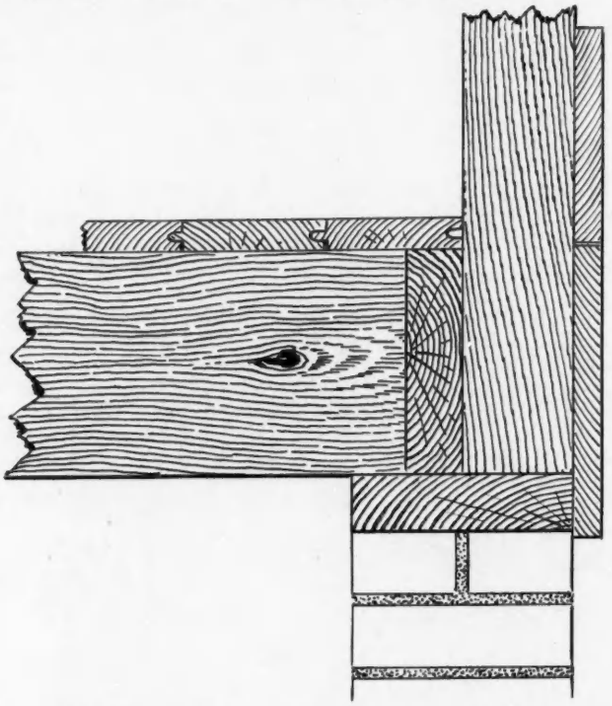
third pitch roof supported by purlin plate and posts, as indicated. This ancient arrangement necessitated the use of two separate tracks, compelling the owner when wishing to put hay into the horse-barn to shift the car from the upper to the lower track. In order to get rid of this great inconvenience it was decided to raise the roof on the horse-barn so as to have one straight ridge the entire length of the two barns, and thus secure the one track desired. It was found after the old roof had been raised to the gambrel form that its strength was not sufficient to load and carry a horse fork. The owner desired if possible to avoid the use of the purlin support, and the result was the brace shown in the illustration, which is constructed as follows: Take a two by six inches by twenty feet, cut it to fit on plate at bottom and strike rafter about two feet from ridge. Spike it thoroughly at top and bottom with number twenty nails. Cut a piece of two by six inches to fit snugly between ridge and top of long brace well spiked to rafter. Repeat this operation on the opposite side of the same rafter. Introduce a tie brace of two by six inches at the knuckle, which is thoroughly spiked in as shown. Repeat this operation on the opposite side of the roof and you have in effect a pair of trusses where before you had only a pair of rafters. This brace would ordinarily suffice with one, two by six inches by twenty feet, instead of two placed six or eight feet apart. This plan makes a stronger roof than the purlin, and its construction requires less of both material and labor.

J. F. HOUCHENS.

Box Sill for Frame Buildings

To the Editor: Inavale, Neb.

As I have never seen any cuts of a box sill for frame buildings given in any builders' magazine as we make them in Nebraska, I will send a plan of ours. The advantages of a sill



made this way are, first, you get the full strength of the studding; second, less work cutting same; third, it makes a tight job all around, so wind, mice or rats cannot get into the house or between the partitions; fourth, it is easier to lay floor, as you have no studding to cut around. This may be new to some one.

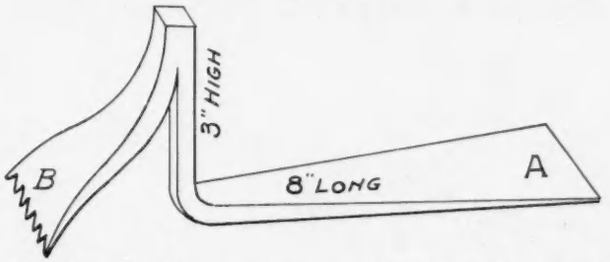
BERT HOLDREDGE.

Roof Brackets for Shingling

To the Editor: Jackson, Mich.

I wish to call attention to an article in the May number on

shingling. Your correspondent describes various methods of constructing roof brackets, some of them being in common use and most of them safe. I send the following sketch of a bracket that I have used for the past twenty years, and have



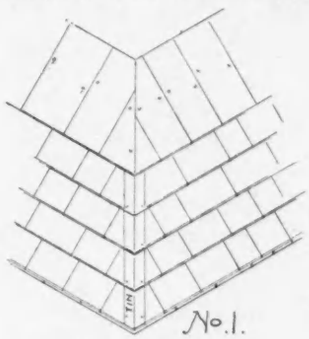
always found to be safe and easily placed or removed. I have used them on roofs of various pitches, and they have never yet failed to stay where they were put, even on the steepest roofs. I had them made by a local blacksmith, the cost being about one dollar and a half per dozen. They are made from half-inch bar steel, shaped as per sketch, and drawn out thin at each end, the upper end, A, widened and thinned so as to slip under a course of shingles, while the lower end, or foot, B, is also drawn out and teeth filed so as to prevent slipping when in place. Nowadays when I see men nailing shingles to a two by four I cannot help thinking, first, of the time it takes to make the bracket; second, the time and bother of removing them from the roof; and, finally, the job of cleaning the studding from the nails and shingles. In these days of close competition I think that the best appliances are none too good, no matter what the work may be. I would be glad to hear from others along these lines, as I make no claim to having the "best" of anything. THOS. MALONEY.

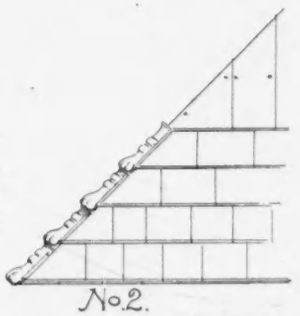
How to Shingle Hips and Valleys

To the Editor: Turnersville, Tex.

I would be pleased to have an illustration of the best way to shingle a hip or valley. I. C. B. LEWIS.

Answer: There are a number of ways of doing this work, but we think the best way is as shown in No. 1 of the accompanying illustration, which is simply a piece of tin about four inches wide and long enough to reach up about an inch and a half under the course of shingles above. The tin should be bent through the middle to fit over the hip and the corners trimmed to fit the angle of the butts of the shingles.



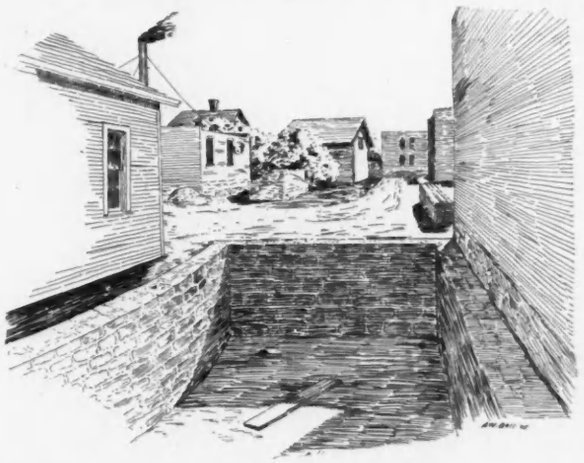


These should be put in as each course of shingles is laid. As for the angle to cut the shingles to fit the hip, that is best obtained by taking a bunch of shingles, say five or six, and tack them together with a slender nail and then apply the square with the same figures that gives the side cut of the jack rafter because the shingle laying in the same position, the angle must necessarily be the same. This also applies to the corresponding valley. The tin for the valley should be not less than fourten inches wide and of best quality, because it will be cheapest in the long run. It should be well soldered and given a coat of oxide of iron paint on both sides several days in advance of using, so as to give it a chance to dry. All flashing tins should be treated in this way. In No. 2 we show an ornamental hip shingle put on as described above. It is made of tin or galvanized iron and pressed as indicated. This makes a very ornamental hip ridge. These shingles are kept in stock at most up-to-date hardware stores. A. W. WOODS.

Curious Curvature of a Wall

To the Editor: Blue Earth, Minn.

The foundation walls shown in the accompanying illustration were for a store building at Blue Earth, Minn., and were two feet thick. The foundation was put in last fall and had



been built but a short time before it caved in. It was entirely rebuilt this spring.

The city lighting plant, the stack of which is shown in the cut, stands in the same block, and the jar of the machinery can be plainly felt in the small frame building to the left. Before the mortar of the new foundation was dry there was a week of almost steady rain. In one night the wall at the left of the illustration was pushed three feet out of a straight line, but remaining nearly plumb from top to bottom. The pressure of the sodden soil outside the wall, combined with the jar of the machinery, are given as the reasons for this curious incident. ARTHUR W. BELL.

Concrete Block Chimney

To the Editor: Lake City, Iowa.

I was very much interested in your article in the May issue on cement, and wish to ask if it is practical to use cement blocks for chimneys. I am building a large factory for the Electrical Concrete Fence Post Company and would like to build the chimneys of cement.

Answer: In my work at the W. W. Sly Manufacturing Company I am erecting a chimney of hollow concrete blocks. The following is an abridged description: Height, eighty feet; inside diameter at top, thirty-six inches, at bottom, forty inches; outside diameter at top, fifty-two inches, at bottom, seventy-two inches. The construction will be octagon and the inside will be covered with two coats of plaster, each one-half inch thick. This plaster and mortar used in laying up the hollow blocks will be made of one part Vulcanite Portland cement and two and one-half parts of lake sand. The blocks will be made of one part Diamond Portland cement and three parts lake sand and two parts crushed basic slag that will pass a half inch screen. Cement is fire proof to that degree of heat at which it was burned in its process of manufacture, and as Diamond Portland cement is burned at 700 degrees Fahrenheit it is used to obtain a beautiful blue color, while Vulcanite

Portland is burned at over 2,000 degrees Fahrenheit and is, in my opinion, safe and used on the interior. I know of no stack like this and hence I cannot guarantee its durability, but have sufficient confidence to stake my reputation on it.

FRED W. HAGLOCH.

Best Method of Mixing Paint

To the Editor: El Dorado, Ark.

Please advise me by letter as to the best method of mixing paints and its cost per square foot, including putting on.

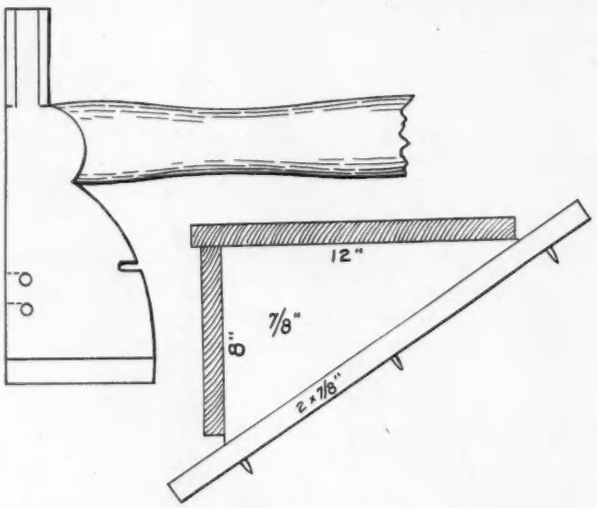
W. H. TRULL.

Answer: Pure white lead and oil paint exclusive of labor of mixing will cost, say from one dollar and ten cents to one dollar and twenty-five cents per gallon, depending on price of oil and turpentine. Mixed paints of any good quality will range from one dollar and fifty cents to one dollar and seventy-five cents per gallon, net. A gallon of paint will cover from four to seven hundred square feet of surface (perhaps even more), one coat, depending on the condition of the surface. Or it will cover from three to five hundred square feet, two coats. On an old painted surface in good condition the covering power is much greater. EDWARD HURST BROWN.

Hatchet for Shingling

To the Editor: Eureka, Kan.

In the article "How to Shingle Properly" in your issue for May I notice the writer's plan of filing notches on the hatchet at the regular distance for courses. We use somewhat the same method here, but in place of the notches at four and one-half and five inches we drill small holes and thread them



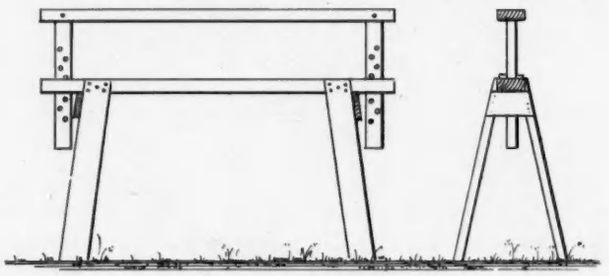
for short bolts which screw in. This leaves the end out, and in using, no line is needed, as the bolt is drawn up against the course below, when the face of the hatchet gives the next course. When used in this way in conjunction with the bracket shown, no chalk line or foot rest is needed. The bracket is very simple. Saw two pieces of seven-eighths stuff eight by twelve inches, and on the sloping edge nail a strip about two inches wide; drive three or four large nails in this strip and file to a point, leaving them projecting about half an inch; nail a board on top and one on front and your bracket is ready for use. In drilling the holes in the hatchet be sure and measure to the upper edge of hole and not to center.

EDGAR E. DISNEY.

Adjustable Trestles

To the Editor: Pittsfield, Ill.

I inclose a sketch of a pair of trestles which I think are pretty handy and save the carpenter lots of stooping. There are times when it is not necessary to have the trestles so low as we commonly use them; for instance, when working with screens, blinds and sashes. Cut a mortise about one by two and three-quarter inches in each end, say about three inches



from each end of the trestle. Take a two by four the same length as the trestles and cut a mortise same as in trestles, only not so long. Take two pieces one by two and one-half inches and two feet long. Hardwood is the best. Fit these pieces tightly into mortise in two by four and pin. Now bore holes in the one by two and one-half inch pieces in a zigzag manner and about two inches apart, and you have it complete. The holes should be a little larger than a large spike nail. You can see by having one of these for each trestle that you can raise and lower your work as it suits you best. Raise to the height wanted and slip a spike in the hole above the trestle and it will stay there until you change it.

BEN JOHNSON.

Cost of Concrete Compared With Stone

To the Editor: Reading, Pa.

Can you advise me as to the expense of concrete foundation walls instead of stone? I am obliged to pay one dollar and twenty cents per perch for stone. Can get Portland cement delivered at one dollar and five cents per barrel, also crushed stone at fifty cents per ton. Will this foundation do as well as if made from solid stone? JAMES H. RENNINGER.

Answer: Labor has much to do with cost of stone walls, hence I can make no comparison for you, but one barrel Portland cement, three barrels of sand (eleven cubic feet) and sixteen cubic feet crushed stone will make one and one-half perch of wall (of twenty-five cubic feet), or one cubic yard of cement (which contains seven and one-half barrels), three cubic yards of sand and five cubic yards of crushed stone will make seven and one-half cubic yards of concrete.

FRED W. HAGLOCH.

Repainting an Old House

To the Editor: Ione, Ore.

What is the best way to paint an old house from which most of the paint has gone? J. LEWIS JONES.

Answer: If the old paint is peeling and scaling, remove as much as possible by scraping or with wire brushes. If powdered, brush well with "duster." Give a coat of oil, mixed in the proportion of four gallons raw linseed oil, one gallon turpentine, about one pint good turpentine driers. If there is still any scaling paint, scrape it off after oiling. When surface is dry give one coat pure white lead and raw linseed oil, with necessary turpentine and driers, tinted as desired. Final coat of lead and oil or mixed paint of approved quality. This would result in a fairly good job, although three coats over oil coat would be even better. EDWARD HURST BROWN.

Miracle Pressed Stone for Building

To the Editor: Orchard, Neb.

Will you please answer a few questions regarding concrete stone? Do you regard the Miracle pressed stone or the

tamped blocks as being the better? How do they compare with the slushed or petrified stone? Is there any danger of the tamped block absorbing enough moisture so that the freezing might scale off the outer surface? J. C. ALEXANDER.

Answer: Miracle pressed stone has proven itself a success, but, like any good blocks, must contain sufficient cement and be properly seasoned. There are at least forty successful "hand damped" blocks used to-day, but of the balance some are simply horrible. The "slushed" block is known as the poured block or wet process. This makes hard blocks in a few months, but in a year the dry tamped block that has been kept constantly damp for at least a week after making will far excell it. Blocks made of one part Portland cement, four parts sand and three parts gravel have sufficient cement to prevent injury from freezing, even though they have been emersed with water. FRED W. HAGLOCH.

How to Cut a Hip Rafter

To the Editor: Hendley, Neb.

I wish you would tell me how to cut a hip rafter, one for a house with a deck. I mean like this: The height from ceiling joist and the size of the deck will give the length of the hip rafter. JOHN HUNNICUTT.

Answer: Deduct the width of the deck from the width of the building and proceed as for the ordinary hip. In other words, if your house is twenty feet wide, and has a deck six feet wide, which, taken from twenty feet, leaves fourteen, and half of fourteen equals the run of the common rafter. Now if your roof has an eight-inch rise to the foot, seventeen and eight will give the seat and plumb cuts. For the side cut take seventeen on the tongue and the length from seventeen diagonally across to eight (which is eighteen and three-quarters) taken on the blade and the latter will give the cut.

A. W. WOODS.

How to Put Ropes in Windows

To put new ropes in windows, take off the strips and hold the lower sash in place. You will find a pocket in the casing about ten inches from the bottom, where the weights are concealed. Take the old ropes from the weights and sash, taking note of the method of fastening. Cut the rope to be put in three-quarters as long as the window. Take a small piece of iron that will slip through the pulleys easily and fasten it to a piece of twine. Tie the other end of the twine to the rope. Drop the small weight through the pulley until it comes down to the pocket. Pull the rope through the pulley and fasten it to the window weight and the sash in the same manner as the old one. Replace the sash and the side strips.

Art in Architecture

Elmer Grey in an article on the architecture of southern California in the Architectural Record writes: "Simplicity alone will not make good architecture. If not produced by the hand of an artist it is apt to be mere baldness. The practical requirements of a plan having been developed, it requires the artist's imagination, his deft touch and sensitive hand to make the final turn which differentiates the work of art from the production of the artisan. The artisan architect, confronted with new building conditions, will solve them with old formulæ, not seeing their significance as opportunities for novel results. The artist will study like conditions until they become a part of him and until the forms most appropriate to their expression take shape in what is at once seen to be a natural and effective solution of the problem."

A Cow's Opinion of the Silo

Laying aside, for a time, our own ideas of the economy, money value and convenience of the silo, let us ask the cow for an opinion on the silo and silage feeding, says an exchange. What would she say? It requires no great stretch of the imagination to hear her answer thus: "That tall, round building which my master calls silo, I consider the most important on the farm. There is more solid food packed inside that round building without windows than it is possible to place in any other structure on the farm. With careful feeding, this feed will last me until grass comes next spring. Next to grass, I prefer this silage to any other feed. I am very fond of it. It is as succulent as June pasture. It sharpens my appetite and enables me to enjoy a bite of dry hay and fodder all the more. I am enjoying the best of health, and am sure it is due to my silage ration. It makes my hair soft, glossy and silky. Master had added up my last month's milk yield, and I heard him say he could not account for the increased amount, unless it was from feeding silage. I am glad that I am done picking the blades off shock fodder thrown on the ground in all kinds of weather. I can now stand in my stall in the barn and eat my mess of warm silage out of a clean trough."

Five to One

We have received more inquiries, 5 to 1, from our ad. in your journal than from any other journal we have ever used. Three-fourths of our mail is addressed "Department A."—R. S. Frost, President, Clipper Machine Co., Dows, Iowa.

Nailing it Down

Your first item in June number says: "Few men care to push a good thing along. They grab for it and try to nail it down." Your magazine is one of the good things I try to push along, but I am nailing down the contents of each issue.—Chas. J. Clark, Smithfield, Va.

Thirty-three per cent of the hickory handles made in this country are exported. No hickory handles are made in other countries.

Many a good workman fails to learn the lesson of how to get satisfaction out of his work except through the pay envelope.

New Tools for the Carpenter and Builder

INTERESTING DESCRIPTIONS AND ILLUSTRATIONS OF IMPORTANT MACHINES AND MATERIALS THAT ENTER INTO HOUSE CONSTRUCTION IN ITS MANY PHASES AND DETAILS

"Cook's" Aluminum Level

Davis & Cook, Watertown, N. Y., are offering to the trade Cook's Patent Plumb and Level, as illustrated. These Levels are made in a variety of glued and solid woods, iron and aluminum frames. Among the prominent features of this Level are the following: The leveling glass being placed across the center of the opening can be seen from either side, and is "never out of sight," whether used over the casing or under the sill. As to the method of adjustment, the inside ring is made of solid drawn brass, the two ends being provided with a flange which is accurately fitted to a groove in the outside ring, and securely fastened to the frame. It will therefore be seen that the only motion of the inside ring, which carries the bulb tube, is an "axial" motion, or "on its own center." Consequently, it is impossible to move the inside ring, or throw the Level out of adjustment, by a fall or jar. Every Level is made of the best material and in the best manner, by skilled workmen. The accuracy and adjustment of all Levels are guaranteed. A large variety of Levels, for all classes of mechanics, are manufactured by this firm. Carpenters, masons and machinists have each their special design. These levels are for sale by all dealers. Their catalogue will be mailed on request, if the writer mentions seeing the advertisement in THE AMERICAN CARPENTER AND BUILDER.

The Ives Window Stop Adjuster

The Ives Patent Stop Adjuster for windows and sliding doors is made of one piece of metal, has a heavy bed that will not bend or cup in tightening the screw, insures protection against draughts, dust, rattling or binding. This device made by the well-known firm, The H. B. Ives Co., New Haven, Conn., manufacturers of window hardware specialties, is coming into general use for the better class of buildings. A further description of same is given in a miniature forty-page catalogue of window hardware specialties which will be mailed free upon application.

Progress in Bit Braces

As an example of progress made in carpenters' tools during the last half century the bit brace may be considered. Almost any man who had to do with tools forty-five or fifty years ago will recall the German bit stock then in use, with its sweep made of wood, and with chuck or socket which necessitated the fitting of each bit to make it secure. This and the pattern with socket and thumbscrew fastening were practically the only styles then in use.

Compare such braces with those made to-day by the Millers Falls Co. of Millers Falls, Mass., and No. 28 Warren St., New York, with nickel-plated steel sweeps, ball-bearing heads, chucks which hold all sizes and shapes of shanks accurately, and their general beauty of finish throughout.

The Millers Falls Co. has been manufacturing bit braces for nearly forty years and has worked the business down to a science at every point. Their output in this line is without doubt larger than that of any other manufacturer in the world. Their braces are taken as the standard in all countries. They also make a considerable variety of other carpenters' and mechanics' tools, among which might be mentioned hand drills, breast drills, drilling machines, automatic boring tools, automatic screw-drivers, hack saws, scroll saws, carving tools, spoke shaves, glass cutters, grindstones, mitre boxes, boring machines, vises, etc.

The Mallory Shutter Worker

The accompanying illustration is of the "Mallory Shutter Worker," a very clever and handy device, which can be attached to any shutter to operate it from the inside of a room without going out around the house to open or close it. This device is a great convenience, for if the weather be wet or cold, a person can adjust the shutter at any angle desired

by turning the handle on the inside and the shutter becomes at once automatically locked there, preventing any slamming or breaking. These shutter workers are being specified by the best architects generally, and are unquestionably the only reliable shutter worker on the market. This concern have issued a little booklet giving full information, which they will send you free of charge by writing them and mentioning AMERICAN CARPENTER AND BUILDER. They are The Mallory Mfg. Co., Flemington, N. J.

Price Not the Only Important Factor

The selection of a heating apparatus should not depend on the mere question of price. Economy in fuel, comfort and health are of vastly greater importance than the saving of a few dollars in the first cost of a heater.

The Kelsey Heating Company of Syracuse, N. Y., publish

an interesting booklet, which tells all about the Kelsey Warm Air Generator, and gives the weight, heating surface and heating capacities of each size.

This little book is intended to tell all about the Kelsey

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 7 and send today.

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

"The Wood-Finishing Authorities."

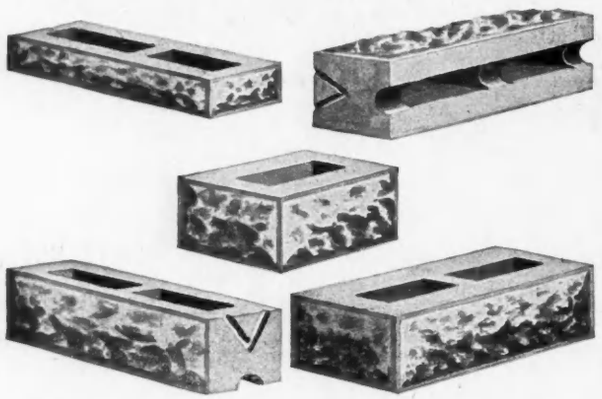
Warm Air Generator, and the best possible method of heating homes, churches, schools and public buildings.

The Kelsey is a hot water boiler converted into a warm air generator.

The Kelsey method of warming air in separate currents is an improved method.

Both Frost and Damp Proof

The Waterloo Concrete Brick and Block Machine Co. located at Waterloo, Iowa, backed with an authorized capital of $60,000, of which $52,000 is already paid up, is made up of young business men of that enterprising city.



The main object was the making of a block that would be damp proof and frost proof. This was attained by the construction of a block that has double air spaces, one of which is vertical, as in the ordinary hollow block, while the other is horizontal, making the air space continuous in a wall made of these blocks.

The horizontal air passage also provides a "handle" which greatly facilitates the handling of the blocks after they are cured. The brick attachment is another desired object. This machine makes 18 brick at one time as easily as a block can be made. Other features of the machine are: the absence of all gears and chain; the block remaining stationary during the operation of the machine; the variety of blocks that can be made from the machine including circle, octagon blocks and porch-pier or chimney blocks.

O. H. Sweeney is secretary. Write him for prices and catalogue "B." He also states his company would establish agencies if there are any who desire to add a machine to their line.

Stratton's Spirit Levels

We call our readers' attention to another part of this magazine containing an advertisement of Stratton Bros.' spirit levels.

In the last thirty-five years this concern have gained and maintained a reputation the world over for making excellent levels for carpenters and mechanics. We recommend this concern to our readers who wish to buy good levels to work with. If they require fuller instruction please write them, mentioning the AMERICAN CARPENTER AND BUILDER. They will send you a book on levels free. Address Stratton Bros., Greenfield, Mass.

The Bradt System

Books on estimating have been offered builders for years, meeting with more or less success, but it has fallen to the lot of a newly prepared method for estimating houses, barns and repair work, to meet with perhaps the greatest sale and popularity of any work of its kind.

The Bradt Pub. Co., Jackson, Mich., whose ad appears in this issue, claim the immense success of the work is mainly due to its rapidity in operation, for instance, a builder after getting its ideas adjusted to his particular locality being able to estimate cost of a moderate sized dwelling in half an hour and also to determine his exact profit.

The low price at which it is offered should enable every carpenter or builder to procure it at once.

A Handy Book for Carpenters

"Modern Estimator and Contractor's Guide," by Fred T. Hodgson, is a complete work on estimating the cost of putting up a building. Beginning with a detailed statement of the various things the estimator must consider in figuring up the cost, it gives the best method of constructing each part and what material to use to obtain the best results under different conditions. The cost of material is estimated from data derived from all parts of the United States and Canada, covering the subject very fully. Frederick J. Drake & Co., Chicago.

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.

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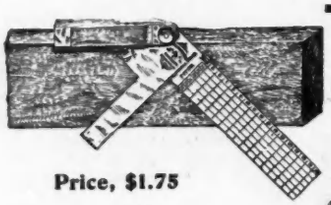

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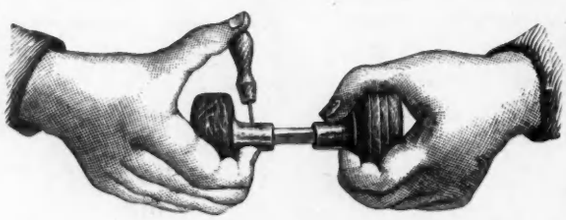

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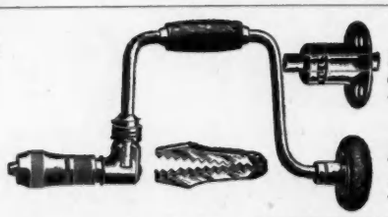

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