AMERICAN CARPENTER AND BUILDER

THE WORLD'S GREATEST BUILDING PAPER

Complete Working Plans of this Residence Appear on Pages 61-69

JULY 1915
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SECTIONAL VIEW
Note Simplicity
This shows how door can swing out. Door always rolls freely and cannot be lifted off.

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER.
"As Good as a Course in Drafting" 
HOW MANY AMBITIOUS CARPENTERS AND BUILDERS LEARN TO DRAW PLANS

W E are not among those who find fault and raise a big yell about amateur plans and the architecture that is hammered out by carpenters. We realize that everyone, even the most skillful, was a beginner once. He had to make a start, and that start was just as often in the hard school of practical experience as in some technical college.

Many of our leading architects today were in the first place builders, and rose from the ranks through their own powers of observation, close study, and hard work.

There is a right and a wrong way to do most everything, and nowhere is this more evident than in the preparing of working drawings for a building. Usage has established certain conventions, as they are called, by which the draftsman indicates on his drawings the various elements of a building. For instance, on a floor plan, windows are indicated in a certain way and doors in another. So long as the draftsman indicates these in the conventional way anyone familiar with plans can know exactly what is meant. But let him deviate from the convention, some way all his own, of indicating doors and windows and the other building elements, and the result is a Chinese puzzle. The man who drew the plans knows what he intended but no one else does.

O, dear! If you could only see some of the plans that really good builders occasionally send in! They are terribly and wonderfully made!

The trouble is in not following established architectural conventions. The remedy is to study carefully the plans turned out by professional architects, observing closely all the little points.

Many good builders get along with little or nothing in the way of regularly prepared building plans. They carry it all in their heads without thinking it necessary to put the definite instructions down on paper.

Perhaps this may be O. K. for a builder who has a small gang and can supervise all the work personally, but it is certainly N. G. as the work grows larger.

Definite directions in the shape of blue-printed working plans and type-written specifications should control every building job. Such plans and specifications are in the first place the only safe basis for the contract; then as the work gets under way they prevent mistakes that are costly both in time and in material. The foremen know just what they are to produce, and the customer is bound to be satisfied when the work is done.

One of the greatest advantages of using a good plan book such as our newest offering, "Guaranteed Building Plans," is that it lets any builder obtain at a very reasonable price complete working plans and specifications for any building illustrated in the book. As these plans are prepared by our own architects (Illinois Licensed) who have made a specialty of this kind of work, they can be accepted as safe models. Many carpenters and builders redraw these plans for practice during slack times, or make minor changes in them to fit special needs. As one builder said recently, "They're as good as a correspondence course in architectural drafting. Anybody can read them and untold numbers are climbing the ladder in the building world through using these helps that are so freely offered them.

Yours for advancement,
EDITOR AMERICAN CARPENTER AND BUILDER.
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A Reasonable Desire

STRUCTURAL ENGINEERS WANT NEW ILLINOIS STATE LICENSE LAW TO PERMIT THEM TO PRACTICE ENGINEERING

With regard to the proposed structural engineers’ license law, it is not the purpose of engineers to practice architecture, nor to pass a law which will enable them to practice architecture without a license. What is wanted, writes Mr. Earl L. Wood of Chicago to The Daily News, is the right to practice structural engineering, and to practice as engineers, and not as architects, without violation of law.

As the law now stands, no one but a licensed architect may design a building in the state of Illinois; and “building” is defined as any structure having walls, foundations and roof. This is a very broad definition, and includes a great deal of what is properly engineering work, and not architecture. Under a strict and literal interpretation of the law an engineer cannot legally design shop and factory buildings, grain elevators, warehouses, mine buildings, including coalbreakers and tipples, in all of which architecture has little or no part, the whole design being made with reference to stability and economy, which is the engineer’s special field.

Architecture is the art of building beautifully. Very properly, the engineering features of any architectural work are subordinate to the architectural requirements. However, the design of the structural engineering features of architectural work is but a small part of the engineer’s field. There are many other structures which he is competent to build, and which are purely engineering works. And it is in order that he legally may perform this work that such a law as has been proposed is needed.

The whole trouble lies with the present architects’ license law, which has created the ridiculous situation whereby an engineer, in order legally to practice engineering, must take out a license as an architect! This is truly an astounding state of affairs!

The proposed engineers’ license law would exempt engineers from the provisions of the architects’ license law. This is necessary in order that the two acts shall not conflict. But it does not follow, as a consequence, that a licensed engineer is a competent architect. He cannot advertise himself as such. He must remain what he is, an engineer.
Bungalow with Unusual Roof Design

The exterior features of the bungalow shown in the accompanying illustrations are worth noting. The projecting roofs with the brackets supporting them and the unique fascia treatment give the place a look of decided originality. This roof treatment combined with the heavy stucco pillars on the porch and the field stone chimney all combine to attract attention. Another handsome effect is created by the loggia or private porch in the front of the house—well protected.

The interior of the house is in keeping with the exterior. The entrance from the porch is on the side into a small vestibule that opens into the living room. This is a square, handsome apartment, featuring a brick fireplace flanked with book cases in the wall across from the entrance.

Along the front of the house next to the living room is a music room which opens out on to the private porch.

The well-lighted dining room occupies the far corner in front.

Along the back of the house are two bedrooms, a bathroom, pantry, and kitchen. The bathroom is placed between the two bedrooms. The kitchen, pantry, and back porch are arranged to provide the maximum convenience with the minimum amount of waste space.

Artistic six-room bungalow. Size 32 by 39 feet. We can furnish complete set of blue-printed working plans and typewritten specifications for only $6.00 per set. Blue-prints consist of basement plan; roof plan; main floor plan; front, rear, two side elevations; wall sections; and all necessary interior details. Specifications consist of twenty-two pages of typewritten matter. When ordering, ask for Design No. 6730.
Column-Supported Hip Roof House

The accompanying illustrations show a seven-room house of artistic and pleasing, yet unusual, appearance. It is a style coming into high favor throughout the West.

The feature of the lower floor arrangement is the large, comfortable living room, extending along one side of the house and measuring 13 by 21 feet. In one end of the room facing the front of the house is a broad square bay, extending out between two pillars as shown in the lower floor plan. This bay contains one large window and has a built-in seat. On the side of the room is a brick fireplace, which is of heavy construction so as to harmonize with the rest of the room. On each side of the fireplace is a window which combine with the wide bay window to make a cheerful, well lighted room. On the opposite side are two cased openings, one to the dining room and the other to the reception and front stair hall.

There is a door to the dining room from this closet hall. The curved bay of three windows is a feature of the dining room. In the back of the dining room a buffet is built against the wall. On the side opposite the window is a door entering the kitchen.

The long, well lighted pantry, extending off the kitchen, should add much to the convenience of the working part of the house. The entrance to the basement and also the back stairs to the second floor are reached through the kitchen. There is also an outside entrance to the basement.

The second floor plan calls for a sleeping porch, a bathroom, and four bedrooms. A little alcove between the two front bedrooms has been partitioned off to serve as a sewing room. The closets are large and convenient in all bedrooms.
Corner Entrance Bungalow

A house presenting a very distinctive and artistic room arrangement is shown in Design No. 6682. The exterior is also designed so as to be a little different than the average bungalow.

The front porch is built around one corner of the house and the front door is built into this corner, which is cut off to make this possible.

The front door is one of the many unusual exterior features of this house. Heavy brass hinges extend almost across and the porch pillars above the top of the railing are also finished in the same way. Rough brick columns extend from the bottom of these pillars to the ground.

The front door opens into a little reception hall, which has doors into the living-room and the dining-room. The triangular closet for wraps in this hall is a feature.

The door to the right as you enter the reception hall goes to the generous living-room. Four windows cover one side of this room almost completely and make it extremely bright and cheery.

At the far end of this room from the reception hall is a colonnade with a cased opening into one of the coziest little dens you ever saw. This den isn't very big, but it can be made into a most attractive nook. Along the rear wall of the den is a big brick fireplace with a bookcase on each side. Light is furnished by a double casement window.

There is an unusually large unobstructed floor space in this plan. In addition to the opening between the den and the living-room, the dining-room is connected to the living-room by a broad

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Guaranteed Building Plans

Corner-lot bungalow of six rooms. Size, 32 feet 6 inches by 35 feet 6 inches. We can furnish complete set of blue-printed working plans and typewritten specifications for only $7.00 per set. Blue-prints consist of basement plan; roof plan; main floor plan; front, rear, two side elevations; wall sections; and all necessary interior details. Specifications consist of twenty-two pages of typewritten matter. When ordering, ask for Design No. 6682.

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[Arrangement of Corner Entrance, Five-Room Bungalow, size 32' 6"x35' 6" diagram]
Substantial Two-Flat Brick Building

A two-flat building of square design is shown here. It is of the substantial type and is built much in various localities.

The lower flat contains five rooms, while the upper one has six, due to the fact that no room is taken up by a vestibule and reception hall. In the upper flat this extra room can be used either as a bedroom or as a den, according to the wishes of the occupants.

The front porch for both flats extends practically the width of the house. The entrance from the lower porch is into a vestibule from which there are stairs to the upper floor and a cased opening into the hall leading to the basement.

The living-room is large and has a three-window bay facing out on to the front porch. There is plenty of wall space in here, which can be made very attractive by the use of well-chosen furniture. The entrance to the dining-room is through a wide-cased opening, which improves the appearance of both rooms.

The living-room is very well arranged. On one side is a wide double window, which provides plenty of light, and across from this is a buffet of generous proportions. From this room is a door to the kitchen and also one to the small back hall, which communicates with the two bedrooms, the bathroom, and the kitchen. This hall adds a great deal to the convenience of getting from one room to another.

The kitchen is designed to insure the maximum amount of comfort and pleasure. In the back of this well-arranged room is a pantry and an entry which will come in handy in working around the kitchen. In the pantry is a cupboard and a refrigerator, to be iced from the back porch.

A well built two flat building. Size, 25 by 44 feet. We can furnish complete set of blue-printed working plans and typewritten specifications for only $9.00 per set. Blue-prints consist of basement plan; roof plan; first and second floor plans; front, rear, two side elevations; wall sections; and all necessary interior details. Specifications consist of twenty-two pages of typewritten matter. When ordering, ask for Design No. 6706.
Well arranged seven-room farm house. Size, 26 by 41 feet. We can furnish complete set of blue-printed working plans and typewritten specifications for only $6.00 per set. Blue prints consist of basement plan; roof plan; first and second floor plans; front, rear, two side elevations; wall sections; and all necessary interior details. Specifications consist of twenty-two pages of typewritten matter. When ordering, ask for Design No. 6721.

Seven-Room Modern Farm House

A farm house of modern, convenient design is shown in Design No. 6721. The rooms are placed so as to provide for the many conditions that are common to the farm and are unknown in towns and cities.

The sides of the house are finished with clapboards and the roof is of the gable type shingled. There is a small porch in front over the entrance, while along the side is a long porch that can be used as the out-door sitting room.

On the main floor, the dining room is the largest room and is combined with the kitchen. In a farm house plan it is necessary to have a large dining room because at certain times of the year a large number have to be fed and it would not be particularly convenient to feed them in installments. The combining of the dining room and kitchen is more convenient for handling a large number of hearty eaters than a separated arrangement. This room is made readily accessible from both the back and front of the house. A long hall reaches to the front porch, and the wash room for the men opens into the dining room and also has a door to the back porch. The door from the side porch also opens into this room.

In back of the combination dining room and kitchen is a wash room, which assists considerably in keeping the house clean. The men can come in from the back porch without having to go into the kitchen and can wash in this room and the kitchen will not be crowded up just before meal times when working space is most needed.

The basement has an outside entrance and is equipped with a workshop, vegetable cellar, fruit closet, heater room and laundry. The vegetable and fruit rooms are placed away from the heating apparatus as far as possible so that they can be kept cool.

The second floor plan calls for three bedrooms and a bathroom. These are arranged with a hall opening to the stairs so as to be convenient. There is also another bedroom on the first floor for the help.
"Equipment Counts in the Bloodless Commercial Fight in America, the Same as in the Gory Battles of Europe"

THE MAN FROM THE LUMBER YARD

We are so impressed with the imperative necessity of every reader, who would be a winner, being properly equipped in all departments, that we have established a bureau to enable us to give information relative to the essentials that may be required in any capacity. This is at the service of our readers.

HERE was considerable interest in the subject of "partnership" in the June letter. One reader inquires as to how he can get his partner to do his part. My first suggestion to this inquirer is: Be sure you yourself are right. It may be that you are as aggravating to him as he is to you.

Some three months since, I was coming north on a slow train through Egypt—Southern Illinois is given that name because of her rich black soil—the frost was out of the ground, and the bottom also seemed to have dropped out of the wagon road.

At a junction station where we had to wait for a connecting train, we were treated to an exhibition of "horse psychology." The heavily loaded wagon was mired to the hubs, and the driver knew no better than to beat his horses. First one would make a desperate struggle, then the other. Conditions seemed to be getting worse until a man whose nasal twang proclaimed him to be a down-easter, asked the driver to let him try his hand. He petted the horses and talked to them a moment and gave each a piece of the apple he was eating. After both horses were calm, he took hold of the bridles and with an encouraging word led them out. Both horses settled into their collars and with a pull together soon had the wagon on firm ground.

Business friction is often a case of "nerves." No partnership matters should be taken up for discussion when either partner is unstrung.

Another reader says he does not like to have to take another man's views into account, but he feels the need of multiplying his own efforts. I would like to suggest some partners that will be of great help and never "fuss you."

I was in a contractor's office last week for about an hour. During that time he was called to the telephone three times. If he had had an extension-phone on his desk he would have saved at least three minutes each time. He could get this help from the telephone company for less than two cents a day.

I see numerous portable-saw rigs are offering themselves as assistants on the job. The cost of the juice used is practically nothing, and such a partner will put a saw through a piece of timber much quicker than any partner you could get to divide your earnings with.

That is the trouble with a partner. He wants to get in on the divide, no matter if he sulks or shirks.

A young fellow I knew several years ago in a small town made a good move when he installed a typewriter—which his wife was able to use—for making out specifications, bids, bills, etc. His competitors always made out their bids on scraps of paper in an illegible way. My friend had good business-like letter heads.
The business-like way in which he got up his bids always begot confidence, and he got the cream of the business at prices always equal to or above other quotations.

Every buyer of a building that does not exist knows that in addition to buying certain specifications, he must buy the mental attitude of the man who does the work. Only a short sighted buyer would hesitate at paying a two or three per cent more for dependability. A neatly typed bid on a good quality paper carries a feeling of dependability that cannot be gotten any other way.

A number of readers of the “A. C. & B.” find they have been able to increase their own capacity (and reduce office expense) by the use of dictating machines. This machine is always ready to work, always accurate; and is on the job ready to take letters before the contractor goes out to oversee the work.

It is perfectly safe for you to say to your wife after supper, “I am going down to the office to dictate a few letters and will be back about ten o’clock,” when she knows that the dictation is taken by a machine and not feminine fingers.

No flesh and blood partners with a breast-drill can keep up with an electric drill; and the cost of a chew of tobacco will pay for a day’s use of power.

Last July, I combined a pleasure and business trip up north and spent some time with a contractor in a small city of 15,000 population. The town was built at the junction point of two rivers, which spread it out. The various buildings this man had under way were widely separated. He consulted me relative to taking a partner to help him in overseeing the work. In talking the matter over I suggested an automobile as being the solution of the matter. He acted on this suggestion. I had a letter from him a month since, in which he mentioned incidentally, that he had never been able to accomplish so much with so little strain, as since he had bought his machine.

I can count a dozen acquaintances that have made motorcycles pay for themselves in a season. They never get tired and they don’t eat when you are not using them. They stand without hitching. When equipped with an extra saddle, it will place a man and his helper with their tools on a job instanter.

Everyone knows that dull tools make dull, tired, inefficient workmen; and contrariwise, everyone knows that sharp tools make for efficiency and speed. This means that a tool-grinder can be added with profit to every kit of tools.

Equipment counts in the bloodless commercial fight in America, the same as in the gory battles of Europe. You know what would happen to an army equipped with muzzle loaders, no matter how numerous, how brave, or how brainy.

Efficiency is now spelled with a big “E.”

I give a dozen efficiency thoughts for your consideration:

The more independent a man is, the more is he dependent on mechanical aids.

Don’t lift by hand when you can use a hoist.

It isn’t how hard you work, but what you accomplish.

Poor men and poor equipment, will break any con-
tractor, carpenter, or builder.

Interest and depreciation are all you can figure against an investment in equipment.

Don't save the cost of a telegram when a delay will cost you more.

A makeshift tool is a handicap to any workman.

Don't travel when you can telephone.

An equipment that saves minutes for a good man, mints money for the employer.

The man who knows the value of time appreciates the value of perfect tools.

When the margin of profit is small time and labor-saving equipment is all that will prevent loss.

Don't use ox cart methods, when you can use an air ship system.

**One-Story Woodworking Shop Built of Hollow Tile**

*INTERESTING DETAILS OF BUSINESS-LIKE SHOP AT PARK RIDGE, ILL.*

By Edwin G. Zorn

BEGINNING with a small shop—we might call it a "shack"—the owner of the mill shown in the accompanying illustrations has, in a few years, expanded to a point where he now has a substantially built factory housing fourteen different woodworking machines and turning out a large quantity of window frames, doors, sideboards, colonnades and other interior finish daily.

It was not more than six years ago that Martin Wiederhold established his little shop in Park Ridge, Ill., then a suburb of Chicago in the making. The possibilities were there, however, and the constantly growing exodus of city residents to fresher air and green fields was accompanied by an increased need for new homes. This, in turn, created a larger demand for millwork and interior finish, the results of which may be seen in the large addition to the "pioneer" factory with still further provision for expansion.

The new addition which is shown herewith was built last summer and is of more than passing interest because of its construction. This building is 38 ft. wide and 100 ft. long. The foundation is of concrete, eight inches thick, upon which is laid a wall composed of 6-inch hollow clay building tile with double air spaces. The interesting fact about this wall is that it carries the entire roof load, which is of no mean consideration in a building of this type where there is a great deal of vibration due to the operation of machinery.

A straight wall was first built without piers of any kind. After it had set and the mortar was dry, the mason constructed 12-inch piers of tile every 12 feet along the wall. The tile were laid on edge for these piers, a hole 12 inches square being made in the inner wall of the tile every 2 feet to permit the insertion or tying-in of the pier tile. When completed, these piers were filled with concrete, making a substantial brace for the wall. At two points in the wall where these piers are located, a weight of three tons is carried, beside the roof thrust.

The floor of this building is of heavy lumber and is carried on joists measuring 2 by 10 inches, the joists in turn being supported by two walls of concrete beside the foundation walls. Three feet of room is al-
Satisfactory Shop Construction

allowed underneath the floor for lumber to be stored. The roof rests on lattice timber trusses supported by the two side walls, there being no posts or columns anywhere in this building.

The ends of the building are constructed of stud-ding and siding. This is indicative of the foresight of the owner and his confidence in the future expansion of his market. It is his intention to add to the building the walls of this structure, stuccoed on the outside, two coats of cement being applied directly to the tile, over which a coat of rough cast will be placed.

The masonry work for all of these buildings was done by a local contractor, while the owner took care of the carpentry work with his own forces, the lumber for which was supplied from his own stock. Mr. Wiederhold says that the buildings as constructed are

as the business grows, which can more easily be done by removing the ends as constructed and continuing the walls and roof, giving the building a uniform appearance at a minimum cost.

In order to reduce as much as possible the fire hazard about the shop, a fireproof shaving vault was built a short distance away and entirely separate from the mill. Like the walls of the main building, this structure is built of hollow tile and acts as a receptacle for the shavings and sawdust gathered from the machines and transmitted from the shop by means of a suction fan. This suction or blower system has an inlet over each machine where the sawdust and shavings are snatched away directly from the knives, saving considerable labor which might otherwise be consumed in cleaning up these wastes from around the machines.

There is now being built in the front part of the mill, and facing the street, an office building which, when completed, will be a worthy addition to the grounds. Hollow clay building tile was also used for entirely satisfactory, the walls of the factory having withstood the vibrations set up by the machinery, the operation of which requires seventy horse-power, without the least sign of failure. In addition to that strain, these walls carry an additional load in the shape of stock lumber, which is stored on the roof trusses.

As to the cost of the masonry work in these buildings, the contractor gives a figure of twelve cents per square foot as the cost of both material and labor. This, however, does not include the stucco covering on the office building, which is extra.

Taking everything into consideration, the type of wall used in the shop here shown has not only proven to be thoroughly substantial and able to stand the wear and tear to which it is subjected, but it also has demonstrated its practicability from an economic standpoint. And further, when it is remembered that these walls will stand for a long period with little or no repairs and without paint, there is no doubt but that the owner has secured in this an expense-proof construction.
"Several of the men," said the Boss, "have asked me about the use of trussed beams and how such a beam should be figured. A great many of you fellows seem to have the idea that all that is necessary in building a trussed beam is to run a steel or iron rod from end to end of a timber beam, dropping it below the beam and holding it in place by using one or two short struts or compression members as shown in Figs. 50 and 51. This is not the case, since there must be a correct balance between the sizes and strengths of the different parts of the beam as in the case of any other structural member. Otherwise the strength of the combination is no greater than that of its weakest part, and there is the place where the ordinary carpenter or builder is entirely lost.

"Trussed beams are used where the length between supporting walls is about thirty feet or over and where it is desired to use timber instead of a plate girder or steel beams. In many instances the trussed beam is the cheapest and most easily constructed member for use in supporting a given load. The beam proper is made of timber, the entire length consisting of one piece if possible. The tie is of steel or iron bent into the shape shown in Fig. 50 or Fig. 51, threaded at the ends and fitted with nuts resting on plates or large washers. The strut, shown in Figs. 52 and 53, may be either of hard wood or cast iron. Oak is very often used for this member where only a small number of struts are needed and where it would not pay to have special iron castings made. The oak strut shown in Fig. 52 is intended for use with two beams and two tie rods. If three beams are to be used, another tongue will be needed at the top, each tongue spaced so as to project up in the spaces between the three beams as shown in Fig. 53. If a single rod is used, the bottom of the strut may be made narrower, but the top should always be made equal to the width of the whole beam.

"If a member of this kind is made up of pieces of timber shorter than the total length of beam, the splices should be made at the middle when one strut is used as in Fig. 50, or at points one-third the distance from the ends if two struts are used, as in Fig. 51. It is common to place the struts in a beam like Fig. 51 just as near the one-third points as possible.

"As an example of the design of a trussed beam, we will figure the sizes of the members of a beam similar to Fig. 50 for a porch 30 feet long and 10 feet wide. We will assume that the roof load of 40 pounds per square foot is brought to the beam by rafters spaced evenly along the beam as shown in Fig. 50. One-half of this total roof load will be carried by the trussed beam and the other half by the walls of the building. The total uniformly distributed load on the beam will be $\frac{1}{2} \times 30 \times 10 \times 40$ pounds, or 6,000 pounds.

"We will assume first that the lowest point that the
rod can be located is 12 inches below the bottom of the beam and that two yellow pine beams 12 inches deep are to be used with two mild steel rods held in place by an oak strut at the center of the beam as in Fig. 50. What we wish to find is the breadth or thickness of the yellow pine beams, the size of the steel rods, and the size of the oak strut. The beam will have to be designed to take care of a direct compressive stress and a bending stress due to the distributed load resting on it. The steel tie is subjected to tension, or a pull. The oak strut will be designed to take the compression acting on it.

‘Kidder, in his ‘Architects’ and Builders’ Pocket Book,’ gives the following rules for finding the total amounts of stress in the various members of the beam:

“For total compression in beam in Fig. 50, multiply one-half the load on the beam in pounds by one-half

$I = \frac{1}{8} \frac{W}{l}$

for bending alone is found by solving the following equation:

$1,000 \times \frac{1}{6} \times b \times h^2 = \frac{1}{8} \times \frac{W}{l}$

Where $b$ is the width in inches, $h$ is the height of the beam in inches, $W$ is the total load on the beam, and $l$ is one-half of the total length of beam in inches. Filling in values for this problem and solving, we have

$1,000 \times \frac{1}{6} \times b \times 12 \times 12 = \frac{1}{8} \times 3,000 \times 15 \times 12$

$b = 3$ inches (nearly).

"Adding this value of 3 inches to the $2\frac{1}{2}$ inches obtained above, we find that a total width of timber of about $5\frac{1}{2}$ inches is needed. Two pieces of 3-inch by 12-inch dressed yellow pine would do for the beam.

"To find the size of steel rod needed, we will apply the rule for total tension in the tie, B, and then find the area of rod by using 15,000 pounds per square inch as the tensile strength of mild steel.

"In applying the tension rule, we find that we need the length of the tie B in Fig 50. This is found by laying off the truss to scale and measuring the length B according to this scale. In our problem, B is found to be about 15 1/10 feet long. Filling in values, we find that the result is as follows:

$\text{Total tension in rod} = \frac{6,000}{2} \times \frac{15.1}{1.5} = 30,200$ lbs.

Dividing 30,200 by 15,000 we find that about 2 square inches of steel are needed. From a table of areas of circles, or by trial, using the formula: Area = $\frac{773}{4} \times \text{diameter} \times \text{diameter}$, it is found that two $3\frac{1}{4}$-inch diameter steel rods with the ends upset before threading, will be needed to carry this stress and to give the area of circular cross-section required above.

"Now apply the rule for total compression in the oak strut.

$\text{Total compression in strut} = \frac{6,000}{2} = 3,000$ pounds.
Trussed Beams

Since the strut is at least the width of the two beams and the two rods, we should make the part that rests on the beam about 8½ to 10 inches wide. If a unit compression strength of 800 pounds per square inch is used for white oak, the thickness of the oak may be computed by the following:

\[ 3,000 = 800 \times 8\frac{1}{2} \times t. \]

From this it is seen that the theoretical thickness is too small to be used in practice. A thickness of at least 2 inches would be advisable.

![Fig. 52. Type of Timber Strut for Trussed Beam, Consisting of Two Pieces.](image)

![Fig. 53. Timber Strut for Trussed Beam Where Three Pieces are Used.](image)

"Since two rods are used, it might be better design to use three 2-inch by 12-inch pieces of yellow pine for the beam instead of the two pieces of 3-inch by 12-inch. This would allow one of the rods to come between each of the pieces.

"If a heavier load is to be carried, it would be advisable to use a truss of the type shown in Fig. 51. Let us assume that a 15,000-pound uniformly distributed load is to be carried on a span of 36 feet under a floor, and that a trussed beam like Fig. 51 is to be used. We will also assume that only 26 inches of head room is available and that the beam is to be made of timber 14 inches deep. This would allow about 18 inches as the length of the strut C.

"The rules for total compression in beam, total tension in tie rod, and total compression in strut C are just the same as those given above with the exception the one-third of the total load on the beam is used instead of one-half the load.

"For the values given above, the calculations for width of beam, size of tie rods, and size of strut C would be as follows:

For width of beam for direct compression,

\[ \text{Total compression} = \frac{15,000 \times 12}{3 \times 1.5} = 40,000 \text{ lbs.} \]

For width of beam for bending,

\[ W = 1,000 \times \frac{1}{14} \times b \times h^2 = \frac{1}{3} \times - \times 1 \]

or,

\[ 1,000 \times \frac{1}{14} \times b \times 14 \times 14 = \frac{1}{3} \times 5,000 \times 12 \times 12 \]

\[ b = 2\frac{7}{10} \text{ inches (nearly).} \]

Total width of beam = \( 2\frac{7}{10} + 2\frac{7}{10} = 5\frac{7}{10} \text{ inches}. \]

If three beams are used, each should be 2 inches by 14 inches in size.

"For size of tie rod,

\[ \text{Total tension} = \frac{\text{15,000} \times 12.1}{3 \times 1.5} = 40,330 \text{ pounds.} \]

\[ \frac{40,330}{15,000} = 2.7 \text{ square inches of cross-section.} \]

By trial or from a table of areas of circles it is seen that two 1\( \frac{3}{4} \)-inch diameter steel rods with ends upset will be needed. These rods are placed in the spaces between the three beams.

"The total compression in the oak struts will be

\[ \frac{15,000}{3} = 5,000 \text{ pounds.} \]

By inspection it is seen that 3 strut 8\( \frac{3}{4} \) inches wide where it joins the beam and 2 inches thick will be amply strong."

What a Well Built Tank Can Stand

By C. L. Edholm

A water tank that can stand being bombarded with a five-ton truck as a projectile, is undoubtedly a well built structure, and as the photo shows, the roof is the only part of this one that was damaged by the impact. It is a redwood structure standing on a concrete foundation, and is situated alongside and below the North Broadway bridge in Los Angeles. The occasion of its severe test for stout construction was when a loaded truck ran off the high roadway, made a half turn in the air and landed squarely on the roof of the tank. It was carrying a big load of ripe tomatoes from a Japanese truck garden in the suburbs, and a couple of Japs were in charge of the machine when it got out of control. By a lucky accident, they were shot through the hole in the roof made by the falling truck, and after floundering about in the water they were rescued, unharmed. Next to the congratulations to the drivers, the warmest expressions of satisfaction were for the carpenters who could set up a tank that would withstand the impact of a truck dropped 15 feet upon it.

Tender it if Tender, if Not, Tender it

Precise Boarding Mistress—"Mr. Blunt, shall I tender you some more of the chicken?"

Mr. Blunt—"No, thank you! But if you can tender this piece you have already served me, I shall be greatly obliged to you."
Modern Schoolhouse for Lawton, Michigan

The design shown here is of a new school that is to be built for the city of Lawton, Michigan. Architect G. W. Ashby, of Chicago, whose school house work is attracting considerable attention, is the designer of this building.

The arrangement of the rooms is according to the Gary, Indiana, plan and is known as the double six. The lower six grades, on the second floor, are handled in the usual way, that is, each grade has a room in which both studying and reciting are done. The seventh and eighth grades and the high school are located on the first floor and are seated in one large assembly room. Recitation rooms are provided for the various classes.

In the basement are several other necessary parts of the modern school building. There is a room for domestic science, one for manual training, a lunch room, and a gymnasium. There are also toilet rooms provided in the basement. The floor of the gymnasium is placed slightly lower than the rest of the basement floor so that a high ceiling can be provided.

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EDITOR'S NOTE—Our readers are urged to make full use of this Department. Put your concreting problems up to us; also write us your experiences and accomplishments in the Cement field for publication here.

Concrete Driveway Leading to Private Garage
HOW TO LAY OUT AND CONSTRUCT A DOUBLE-PATH DRIVEWAY
By H. Colin Campbell, C. E.

The accompanying photographs are alone almost sufficient to illustrate a satisfactory and economical method of constructing a concrete automobile driveway in the form of two strips, to permit reaching a private garage placed at the rear of the residence grounds. The driveway approach shown, is rather out of the ordinary, in that it was given a width of 11 feet 6 inches at the street curb and from there curved toward the sidewalk to a minimum width of 8 feet. The rise in 20 feet from the curb to the sidewalk was 18 inches.

In constructing this entrance way, the street curb and gutter were removed to the nearest joint at each side of the driveway, which required placing about 3 feet of curb and gutter on each side of the drive, the intervening gutter being made monolithic with it. The curb at each side of the driveway is about 5 inches high and 6 inches wide. This curb was built integral with the driveway itself curving into the driveway and sloping toward the sidewalk, becoming similar in height and width and being warped into a rounded surface until it straightened out at a distance of about 3 feet from the sidewalk line.

Back of the sidewalk the driveway has two concrete rails or strips, each 20 inches wide. The inside edges of these strips extend beyond the sidewalk toward the approach about 8 feet and then shape a curve. Continuing back from the sidewalk, these two concrete rails are laid in slabs 10 feet long, with every other joint filled with 1/8-inch asphalt joint filler, the intermediate joints being merely construction joints.

Concrete for the entire driveway was one-course construction, consisting of a 1:2:3 mixture. The concrete was deposited in a continuous operation, struck off and floated with a wooden float, leaving the surface with a rough texture similar to the surface of

Immediately in Front of the Garage the Double-Path Driveway Merges into a Concrete "Turn Around" of Ample Size.
CONCRETE STREET PAVEMENTS. The approach and curb were built in the same manner, being divided into three slabs with expansion joints $\frac{3}{8}$ inch wide at the intersection of gutter and brick pavement, and at the sidewalk line.

Forms for the driveway were 2 by 6-inch planks, staked into position as shown in the photos. Short, round bends were made with sheet galvanized iron for forms. Bulkheads were placed in the forms where joints would occur and slabs laid alternately. After bulkheads were removed, intermediate slabs were finished.

**Oil-Mixed Concrete for Damp Proofing**

EXPERIMENTS IN THE DEPARTMENT OF AGRICULTURE DEMONSTRATE ITS VALUE IN MANY KINDS OF BUILDINGS

AFTER extensive laboratory and service tests the Department of Agriculture has secured results which appear to establish definitely the value of oil-mixed concrete for damp-proof construction. Detailed results of these tests, which were carried out in connection with the work of the Office of Public Roads, are contained in the new bulletin, No. 230, of the Department, entitled “Oil-Mixed Portland Cement Concrete.” Briefly summarized, the conclusions to be drawn from them are that the admixture of certain mineral oils in small proportions, not to exceed 10 per cent of cement used, does not lessen the tensile strength of mortar; that the decrease in the compressive strength of mortar and concrete is not serious; that concrete mixed with oil takes much longer to set hard, perhaps twice as long, but that the increase in strength is nearly as rapid in the oil-mixed material as in the plain concrete. The use of oil does not make the concrete impervious to heavy water pressure, but it does make it practically non-absorbent under low heads.

The value of oil-mixed concrete is said to be particularly great in the construction of basement floors and walls, watering troughs, cisterns, barns, silos, and in all parts of concrete structures that are to be made damp-proof.

The oil should in no case exceed 10 per cent of the weight of the cement and for the most part, 5 per cent is all that is necessary. Since a bag of cement weighs 94 pounds, 4.7 pounds of oil, or about 2½ quarts, should be added for each bag of cement used in the mixture. The sand and cement should be first mixed with the proper amount of water into a stiff mortar, to which is added the correct amount of oil, and the whole mass again thoroughly mixed until all traces of oil have disappeared. Particular care should be taken to insure that the oil is thoroughly incorporated in the mixture and the time of mixing should be practically double that when the oil is not used. For this reason a continuous mixer should not be used in oil-cement-concrete work, as it is difficult with this type of machine to increase the time of mixing sufficiently.

The kind of oil is also important and the following technical specifications are suggested in the bulletin in order to prevent the use of certain oils which might tend to impair the strength of the mortar or the concrete:

1. The oil shall be a fluid petroleum product and shall contain no admixture of fatty or vegetable oils.
2. It shall have a specific gravity not greater than 0.945 at a temperature of 25 deg. C.
3. It shall show a flash point of not less than 150 deg. C. by the closed-cup method.
4. When 240 cc. of the oil is heated in an Engler viscosimeter to 50 deg. C., and maintained at that temperature for at least three minutes, the first 100 cc. which flows out shall show a specific viscosity of not less than 15 nor more than 30.
5. When 1 part of the oil is shaken up with 2 parts of hundredth normal caustic soda, there shall be no emulsification, and upon allowing the mixture to remain quiet the two components shall rapidly separate in distinct layers.

For practical use the addition of oil will be found particularly useful in the construction of basement floors and walls. Many of these now in existence are continually damp and such a condition may be remedied by the application of an oil-mixed mortar coat to the old surface. A mortar composed of one part of cement and two parts sand and containing 5 per cent of oil should be sufficiently non-absorbent for this purpose.
Watering troughs and cisterns made of oil-mixed concrete should also prove of considerable practical value in the conservation of water. In the construction of barns, where oil-mixed concrete is used, the interior will be noticeably drier than when ordinary concrete is used. Owing to their durability, cleanliness, and resistance to fire, concrete barns are becoming more and more popular, but they suffer from the disadvantage that during a long beating rain the side walls are inclined to absorb much moisture, which ultimately penetrates into the interior. The addition of oil to the extent of 5 per cent of the weight of cement in the concrete used in the side walls obviates this objection. Barn floors can also be constructed in the same way with advantage. A damp-proof floor is warmer because of the lack of evaporation from its surface, and it is also more sanitary than an ordinary concrete floor because of its non-absorbent character.

There are, of course, any number of other types of buildings and structures of all sorts in which oil-mixed concrete may be used advantageously, or, if this is not necessary, a coat of oil-mixed mortar may be applied effectively.

Attention is called, however, to the fact that extreme care in proportioning, mixing, and placing the concrete is absolutely necessary if the addition of any waterproofing agent is to be of value. The process of mixing oil with concrete has been covered by a public patent, so that any one is at liberty to use it. The methods of using this material are discussed more fully in the bulletin already mentioned.

Garages by the Barrel
A New Form of Garage Construction
By C. L. Edholm

A practical idea in the construction of a small garage is the barrel-like design of the one shown in the photograph. It has the great advantages of strength and durability coupled with economy of material and labor, for the building comes from the mill all ready to set up and about an hour's work will be sufficient.

The parts all fit together and not a nail is required in the construction as the heavy two-inch boards that form the sides are joined by tongue and groove, and are secured by four thick hoops. The latter are joined at the top by bolts, so that they can be drawn tight or cast loose by a few minutes work with a monkey wrench.

A feature of importance is the ease with which the building can be taken apart for removal. In about half an hour it can be dismantled and may be carried as a single wagon load to be set up elsewhere. This feature makes it available for other purposes besides a garage. As a summer camp house it is O. K. It is ten by four-


The Barrel Garage is Easily Assembled and Makes a Substantial Structure.

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Three Four-Room Bungalows in Twenty-Six Hours—Who Can Beat It?

An interesting building race has recently been staged in Binghamton, N. Y.

Binghamton has a law that no saloon can be established unless it has a two-thirds vote from all the residents within a radius of 300 feet. Taking advantage of this law, the liquor interests applied for a license for a vacant lot with no houses within a radius of 300 feet. A wealthy Binghamton man had an estate directly opposite the proposed saloon. He heard of the license proceedings over the long distance phone and the race was on.

Authority to erect homes within the 300-foot limit was received at four o'clock Monday, and at four o'clock Tuesday morning a complete four-room bungalow with a family occupied the adjoining property to the saloon. This made the vote even. While this house was being built through the night, the liquor interests were endeavoring to build a temporary saloon, so they could apply for a license. Side by side the workmen labored through the night, cheered on by an extremely interested throng which often participated in the race by interfering with the wheelbarrows of the saloon builders. The bungalows were built by the Jones-Beers Construction Company.

The saloon men then moved a family into a barn inside the 300-foot limit and claimed a two-thirds vote and once more applied for the license. Two more bungalows were then built in fourteen hours and one was occupied, which gave the advantage to the dry interests again.
The next point is the diameter of the casings or outside jacket and its method of construction. The casing should be large enough to allow sufficient quantities of air to pass up over the heating surfaces and properly insulated with some nonconductor like asbestos or an air cell between two linings to prevent radiation through jacket into cellar.

The space between the jacket and the castings of the furnace should be at least equal in capacity or opening to the cross sectional area of all of the warm air conductor pipes that are used to carry the heat away. If the casing is too large the air will go through insufficiently heated, if too small heat will radiaate through casings even if insulated.

The heater should also be equipped with a suitable water-pan or humidifier with sufficient surface and so placed in the heater as to evaporate a considerable quantity of water.

A checkdraft and damper for smoke pipe.
A coal and ash shovel of proper size and shape for feed door and ash pit door and with handle bent enough to reach rear of ash pit.
A clean out brush and poker

Registers and Pipes
After you have made a careful comparison of the heater itself then find out what is planned to go with it. Find out what kind of registers the heating contractor is going to furnish, whether of stamped-steel or cast iron and the finish of each. Find out all about the cool air supply, where it is to come from and how it is to be conducted to the furnace, what the wall or partition pipes are to be composed of and how protected, how the cellar pipes are to be constructed and placed and what the combined capacity of all the warm air pipes is to be and the same information about the total cold air supply.

The great trouble with most people in buying a furnace is that they hear so much from the heating contractors that they get confused and are liable to be overpersuaded by some minor good sounding talking point that will not mean much to them when they come to get the heater in use. The best plan is to pin your faith on a few of the things that are always important. Make the heating contractor furnish you with the following data and compare it with the same data furnished by all the other contractors. With the help of this information any building contractor with his good buying experience cannot go far wrong.

Now before you decide, judge from the talk and the information you receive from outsiders who have already done business with him, the ability of each heating man in his work and also find out who is going to install the job. The best furnace made will not work right if it is not connected to a well planned heating system and a brainless installer can botch the finest product of the most expert heating engineer's intellect.

Buy brains and experience along with the iron and steel and you will not regret it.

What to Demand of the Heating Contractor
When you have the different furnaces, methods of installation, etc., explained to you fully and a compiled comparison of essentials prepared, you are ready to place the order.

A great many statements have been made by each heating contractor which you may not doubt but which you want to protect yourself against in case they have been overestimated or will not be substantiated by the goods.

So you want to protect yourself or your principal by a guarantee in writing covering the following,—

That the furnace when installed as the heating contractor has it planned will warm the building in the coldest of winter weather that you are accustomed to have in the locality in which the building is situated.

Then as there is a chance of castings or steel parts
being defective when they are built into the furnace, you want to have some kind of a guarantee against flaws and defective materials. And in the written contract there should be a statement that the heating contractor is to replace any defective materials free of charge that develop or make themselves manifest within a certain time. This period of guarantee ought not to be less than one year and the greater the length of time the heating contractor is willing to extend this guarantee on the parts of the furnace, the greater faith he must have in his goods and the greater faith you should have in him.

If the heating contractor is not entirely responsible the contract should be drawn up so that the heating system will not be paid for in full until you have had a chance to test it out in coldest winter weather.

What to Do as the Job is Being Erected

Now that you have the order placed it is a good plan regardless of what kind of a contract you have or how careful the mechanic is or how much faith you have in the heating contractor to be on hand as much as possible and watch the plant being erected to see that the work is being done in a workmanlike manner and that everything is up to the standard promised and guaranteed by the heating contractor.

Another advantage of watching the work at this time is that you can become familiar with the construction of the heater; and as it is being erected the mechanic can explain to you the functions of the various parts, their relation to each other and the best way to get the most satisfactory results from the heater and you can help the owner to get better results.

The average owner knows about as much about the hidden parts of the home building business as you know about his business, and although he may not say so, he depends on you for help even if he has an architect.

How Does This Concern the Builder?

You are the practical man on the job and he believes in you and expects the best from you or you wouldn't have his job.

If the owner places his own heating contract or the architect does it, don't say, "O! Well, it is none of my business. It's no skin off of my nose if he gets stung on his furnace." That is not the right attitude to take. It is true you have no legal responsibility but you do have a moral responsibility because the owner is making a home of the building you are erecting for him and that building must be comfortable and complete in its equipment to make it a real home and to make the owner happy and satisfied.

Another thing this completed building is your work, the offspring of your brain and intelligence, and you should be and are proud of it. So see that it is completed in every requirement and go beyond the letter of your contract to make him happy, comfortable and satisfied, and remember the first requirement of comfort is bodily warmth—and bodily warmth makes a man happy—and a happy man is satisfied—and he boosts you to his neighbor—and his neighbor is going to build next year.

Artistic Boathouses for Lake Resorts

HOW TO PLAN AND BUILD THEM

By George Ethelbert Walsh

ONE of the building problems confronting owners of summer residences on lakes or rivers is the construction of buildings, for the housing of the boats, that will conform to the general style of the residence architecture and in no wise detract from the natural beauty and harmony of the water front. Anybody can knock together a cheap wooden or canvas boathouse that may answer all practical purposes in the protection of the small craft from the elements; but the owner of a picturesque waterfront does not want to mar the scenery of a lake or river view by an ugly building, nor have his neighbors do the same. Before the coming of the motorboat, this question did not call for solution, for the sailboat could be moored at the dock or to a buoy off shore, and its appearance there in front of a country residence did not detract from the view or produce a sense of incongruity.

But the modern motorboat is a different product of our times. Its handsomely finished decking must be protected from the rains and dews, and even its engine and machinery last much longer if not exposed to the elements. The mahogany decks of some of these motorboats are as handsome and as finely finished as the case of a piano. They must, therefore, have a proper house for summer, and a good storage place for winter.

There is no small or large lake in the East or West where this problem is not now important. By reason of its location right on the waterfront, the boathouse is really more conspicuous than the residence itself. It may, therefore, mar or make the scenery of a lake or river. On Lake Hopatcong, New Jersey, forty-five miles from New York as the crow flies, over 450 motorboats are in commission every summer, and most of these are housed there through the winter. The lake is only nine miles long and four to five miles wide, but it has a waterfront approximating fifty miles. Still
even with this extensive water line, the housing of 450 motorboats has become a problem that has more than once threatened the entire beauty and natural picturesqueness of the lake. The cheap boathouses have sprung up in places, and at a few points they have sadly injured the view. On the other hand, the owners of the country homes there have in a great number of cases co-operated in protecting their views, and the appearance of the numerous boathouses has not disfigured the landscape.

The ideal boathouse consists of something more than a covered slip to run the boat in for the night. It includes a covered slip, with a platform on either side for landing, a tool-house at one end where one can make ordinary repairs to the boat or machinery, a storage closet for cushions, awnings and accessories, a contrivance for lifting the boat out of water overhead, and a general dock or landing place on the outside of the house. A good many of the more ambitious boathouses on Lake Hopatcong are two-story affairs, with rooms above for resting on warm days or even for dancing purposes or for card playing. These upper stories are put to a variety of purposes, and are often used for sleeping and even cooking purposes on special occasions.

A boathouse of this character must have a firm foundation on which to rest. The usual way is to construct a foundation of timber cribbing filled in with stones, and topped off with cement and boards. The frame of the house is then laid on this foundation in the usual manner. A stone or concrete foundation, however, must have the sides protected with boards, or the boat chafing against it will quickly cause irreparable injury. All types of boathouses may be seen on Lake Hopatcong, from the ancient rough, undressed timber affair rising from the water without any apparent effort to make it ornamental up to the two-story houses costing several thousand dollars. These latter are often of considerable architectural beauty, and they suggest the key-note to the architecture of the residence partly visible through the trees in the background. Between these extremes are many which make excellent accommodations for motorboats at a cost of only a few hundred dollars.

The winter storage of a motorboat must always be considered in building a house for summer use. Very little extra cost is necessary to provide storage facilities in the building. The chief essential is that sufficiently strong cross-beams are placed over the bow and stern to lift the craft out of the water with tackle. Slings are placed under the boat at bow and stern, and by means of a chain or rope tackle it is lifted above the level of the inside landing platform. Then three planks, two or three inches thick, are passed under the boat with ends resting on the top edge of the platform. These planks should be placed at the bow and stern and the middle of the boat. The craft is then lowered gently until the keel rests on the planks. The tackle is tightened so that it carries a part of the strain. There is no possibility then of any part of the hull being strained while in winter storage, for the weight is distributed over the three planks and the two end tackles overhead. Hanging a boat by tackle alone is unsafe, for if anything should happen to the rope or chain the boat might drop down and smash some part of it. In the spring the boat can be launched within a very short time in the boathouse slip, or the hull can be painted.
Motor Boat Houses

Boathouse with Second Floor Largely an Open Pavilion Overlooking the Water.

and caulked up while resting on the planks. All the old difficulties of hauling the boat out of the water on some sandy beach to paint and caulk it up are thus avoided. Not only that, but the boat can be hauled out of the water any number of times in the summer for inspection or repair of the hull underneath.

A rope tackle can easily be rigged up to haul the motorboat of twenty feet or under, but for boats longer than this a chain tackle should be employed. A couple of these automatic-acting chain tackles may be purchased from $15 up, depending upon its size. They are graded to lift from half a ton up to any weight desired. One man can adjust and haul out a boat with such a chain tackle.

The workshop and storage room in the boathouse need not take up much room, and the extra cost of providing space for these is inconsiderable. There should be a small but stout work bench, and a hand vise of sufficient power to hold a piece of iron piping when being sawed off with a hack-saw. Tools for working both in wood and metal should be a part of the equipment. Purchased singly and with an eye to their special fitness, they would not cost more than ten or fifteen dollars. With such tools the owner of a motorboat could repair and tinker away at his boat in rainy weather and save within a season enough to pay for the tools and a part of the cost of the boathouse. The engine could be lifted out of the boat with the hoisting tackle for any repairs or for re-setting.

The upper story of the boathouse can be designed to suit almost any need or taste. Various styles and arrangements may be noted in the illustrations.

In the construction of any boathouse a good deal depends upon the depth and the nature of the water. Where the land drops off suddenly at the water’s edge, and the depth exceeds fifteen or twenty feet, the cost of building a foundation for the boathouse may equal or even surpass the total cost of the house itself. Consequently in making estimates upon the cost of a boathouse it is necessary first to study the nature of the water approach. At Lake Hopatcong the water is often so deep within a few feet of the land that the work of building boathouses is difficult. At one place the water is upward of forty feet deep at the end of the boathouse, and it was impossible to build a foundation up from the bottom at any ordinary cost. The boathouse was built on two big pontoons, which float on the surface, but are securely anchored in position.

Popular Type of Inexpensive Motor Boathouse.

And a bass was caught

Bill’s Measure

Silas—"The fishing is very good here. A bass was caught yesterday weighing nearly four pounds."

Hank—"Who caught him—Bill Yapp?"

Silas—"Heavens, no! If Bill had caught him he’d have weighed nearly eight!"
How to Use the Steel Square

THE CONCLUSION OF WOODS’ ANNUAL SERMON TO BEGINNERS, ILLUSTRATING THE GOVERNING PARTS IN FRAMING A TEN-SIDED ROOF WITH A TEN-INCH RISE

By A. W. Woods

WELL, here we are again on the same subject—a ten-sided roof, with a 10-inch rise. We have no doubt you are beginning to think we have been doing a good deal of talking on this one subject, but we wish to remind you again that our remarks are not confined to a single example, for the principle involved applies to any other shape the building may have. The main thing is to get started right—to know you are right and then go right ahead.

In the three foregoing lessons we believe we have covered all of the points that enter into the roof, regardless of size or pitch, and so we have decided to conclude the subject by running circles around it; but not as a grand finale, because it is really the beginning. In other words, we have made the round trip, accomplished our purpose and are back to the point from which we started; and we have not brought forth a thing but what is based on mathematical principles established by mathematicians thousands of years ago. We have tried to look it up to see to whom credit is due. The encyclopedias tell us that it was Ptolemy, a Greco-Egyptian astronomer who, in the second century, perfected the system of circular measurement. We mention this merely to show that the system we are advocating is not so new as it might appear, and to further show that the principle involved in roof framing antedates the so-called steel square by a long ways—how long we cannot say, but to a point we believe the memory of man runneth not. To our mind, it had its inception in the circle as it can be made to represent a part of the whole thing; and the whole secret lies in the fact of knowing how to apply one to the other.

We are not going to take up space here to explain circular measurement, because any one that has passed the eighth grade of our common schools, should know that without further explanations on our part.

The illustration shows all of the angles that we have mentioned in the previous three articles, and we leave it now with you to study the relationship of one to the other. The only figure shown in the illustration is that for the angle in degrees between the runs of the common rafter and hip. This is the angle to take on the square to obtain the miter, and furnishes the starting point for the level plane work for any pitch we wish to give the roof. In this, it is a 10-inch rise to the foot; and all of the lengths and bevels for the cuts are developed accordingly. In some countries the rise is reckoned in degrees, and in that case we have the reckoning in circular measurement in both the horizontal and perpendicular.

In connection with the angles, which you will note are all right angle triangles, we have shown other circles to illustrate relative parts in the way of lengths, tangents, etc.

With this, we close with the hope that our efforts to enlighten have given a clearer insight into the mysteries of intricate roof framing to those who want to understand the true principles involved.

LAUGH less at your neighbor’s troubles and more at your own.
Study or Boudoir in Mahogany and White Enamel. Notice the Distinctive Touch Given by the Mahogany Edging All Around the Windows and Doors and Along the Dado. Paneling is All White; the Window Sash Top, the Shoe Mould and the Door, Mahogany.
Complete Set of Plans for Fine Brick Residence

DIGNIFIED, substantial residence, possessing all the modern improvements, is illustrated on this page, and the complete set of working drawings from which this structure can be built are presented on the pages following. This is a brick veneered house of the square, hip roof design. It measures approximately 32 feet in width and 31 feet in depth, not including porches or sun parlor.

This residence is of the style that is now being preferred by all of the best people for average sized, comfortable homes of the better sort. There is nothing pretentious about this design, yet it is plenty large enough, is nicely arranged both upstairs and down, and contains just enough of the little luxuries and improvements to make it a thoroughly appreciated home.

Notice, for instance, the sun parlor opening off the dining room. This room is made up almost entirely of windows. In the summertime, when all of these windows are open and screens are in, this room is just as comfortable as living out doors. In winter, with the windows closed and possibly with storm sash on,

(Continued to page 67.)

Substantial Brick Veneered House of Eight Rooms. Size 31 by 31 feet. We can furnish complete blue-printed working plans and typewritten specifications for only $10.00 per set. Blue-prints consist of basement plan; roof plan; first and second floor plans; front, rear, two side elevations; wall sections, and all necessary interior details. Specifications consist of twenty-two pages of typewritten matter. When ordering, ask for Design No. 6643.

COMPLETE WORKING DRAWINGS FOR THIS HOUSE ARE PRESENTED ON THE EIGHT PAGES FOLLOWING
BASEMENT PLAN

(FOR PERSPECTIVE VIEW SEE PAGE 61)
Working Plans for Brick Residence

Second Floor Plan

(FOR PERSPECTIVE VIEW, SEE PAGE 61)
This is a real sun parlor, warm and bright. The floor is cement, laid off in squares, waterproofed so that a sudden storm beating in does no damage. The sun parlor is separated from the dining room by a pair of French glazed doors, and on each side of these is a glazed panel.

The first floor of this dwelling provides a vestibule, stair hall, living room and dining room, all of ample size; also a nicely arranged kitchen and pantry. On the second floor are four large apartments and extra generous amount of closet room.

A careful study of the working drawings, including the numerous details, will bring to light the many fine ideas of modern planning embodied in this design.
To Mend Blazing Gas Main

Here is a scheme for stopping a blazing leak in a big high-pressure gas main in San Francisco. Some unknown men who wanted to make trouble set off a chemical preparation on the gas main, with the result that in a few seconds a hole had been melted in the main, the gas poured out, and a great flame shot 25 feet in the air. It was then after midnight, and it was very inadvisable to shut the big main off, so it was decided to make an attempt to stop the leak without shutting off the gas.

An oil-well trick was used. An iron pipe 6 inches in diameter and 20 feet long was stood on end beside the gas main and then by careful manipulation placed directly over the leak. This sent the leaking gas shooting through the pipe and flaming out at the top, 20 feet in the air. Some gas leaked out at the bottom of the pipe; but this was easily stopped; so the only flame was that at the top of the pipe.

Ropes had been attached to the pipe; and finally at a given signal the ropes were yanked and the pipe was thrown many feet away from the gas main. The pipe carried the flame with it. The leaking gas then shot directly into the air from the main; but, as there was no flame near, it did not burn. It was then a comparatively simple task to plug the hole until permanent repairs could be made.—The Saturday Evening Post.
I AM about to discuss with myself the usefulness, or possibilities, of a stair pitch board. Many mechanics use the pitch board in laying out the strings and horses, while others do not, but use the steel square altogether, which is only a matter of taste.

I find in making a pitch board accurate, that a rise of 7\(\frac{1}{4}\) inches and a tread of 9\(\frac{1}{4}\) inches give a fairly good stairs to use. The number 66 seems to be the product many stair builders try to keep to; as, for instance, by multiplying the rise by the tread, \(5\frac{1}{4} \times 12 = 66\). But 7\(\frac{1}{4}\) times 9\(\frac{1}{4}\), as in this case, exceeds the magic 66 by 5\(\frac{1}{2}\). However, stairs of this proportion are not too steep, nor treads too narrow. Moreover, the proportion oftentimes plays a secondary part, since many times—entirely too many—the stairs are to be put up in the room that is allowed them. It seems as though the designers now-a-days use up all the room they can for closets, nooks, etc., and if they overlook a spot, they use it for the stairway.

But getting back to the pitch board, as shown in sketch with corners marked A, B and C. On a stairs 7\(\frac{1}{4}\) by 9\(\frac{1}{4}\) the encline by degrees is 38 deg. 30 min. or 38\(\frac{3}{4}\) deg. This seems reasonable enough for a stairs. If three balusters are to be put on a tread, divide the tread into three parts, or mark off on the pitch board the positions of the balusters; this may assist when laying out the dovetails also. In the present case, lay off three balusters 1\(\frac{3}{8}\) by 1\(\frac{3}{8}\) inches on the pitch board, which gives spaces 3\(\frac{3}{12}\) on centers. You will notice the pitch board is marked off in degrees—38\(\frac{3}{4}\) deg. at bottom, 51\(\frac{3}{8}\) deg. at top; these added together make 90 deg., which is always the case with right angle triangles, the other two inside angles combined make 90 deg.

You will notice I have the rise divided into three parts; these represent the difference in lengths of the balusters. Also the angle A is the plumb cut for the rake rail, using A C as rake and A B as cut. The distance or hypothenuse A C gives the length of string or rail for one step, and to find the rail lengths, measure this distance, count the steps and multiply.

In laying out panel heights in newels, I use the pitch board this way. A stair rail is usually 2 feet 6 inches high; measure plumb up from top of finished tread and over face of finished rise. If the rail is 2 feet 6 inches from the finished rise and the newel 5 by 5 inches is set as is customary—center of newel to face of rise—then you have the measure back or ahead 2\(\frac{1}{2}\) inches, or half the width of newel on the pitch board to give the height of rail as it strikes the newel. In this case, measure on detail of pitch board from X to Z, which gives the distance that is to be subtracted from 2 feet 6 inches. The answer is the height from the top of tread to top of rail J, as measured on the newel. Now, then, to get the distance the rake rail covers up on the newel, draw a line on the pitch board, S S, parallel with A C, the distance the hand rail is high; measure on A B to give the depth on rake cut. By having this done you can determine how much margin to allow flat from where the panel starts up to the bottom of the rail.
Jasbury Talks

In case of a newel at the starting of a flight of stairs, or starting up from a landing is the same, as regards the finding of rail or panel height, except the distance on the pitch board, X Z, is added to the 2 feet 6 inches instead of taken from, as before.

I hope the foregoing is clear to you, as I have made use of it many times in laying out newels. It saves laying them out full size on the floor or building paper.

TO LAY OUT ELLIPSE. Speaking about "laying out" mill work, I had an old cabinet maker give me a method of laying out an ellipse today. I have more than one way of doing this, but there are others—so it seems. Say we want an ellipse 10-inch minor axis, 20-inch major axis. He took a strip ⅜ by ⅜ inch, cut it 10 inches long, and driving a nail at 5 inches he put my steel square on the bench, so that, say, 6 inches hung over the edge of the bench; he then put the rod or stick up against the blade of the square, edge to edge, with the nail up against the edge of the bench. He then moved the trammel, or rod, to the right, keeping the nail sliding along against the edge of the bench, the heel of the trammel sliding along against the edge of the square and a lead pencil at the outer end of the rod, made a very correct quarter of an ellipse. Reversed the process and a semi-ellipse was had in all its glory. Do not stop yet, I am going to draw this idea.

TOUGH LUCK!—ALWAYS TOO LATE OR TOO EARLY FOR CHRISTENING. Speaking about temperance and carpentry, I knew a contractor who was some superstitious. He would always raise the northwest corner post first, or the one to the right rear as he faced the building. He would oft-times buy a pint of whiskey and pour it around the foundation. This was for luck, he would say, but the carpenters who were on good terms with Mr. Barleycorn called it poor luck for them.

Speaking of christening buildings, also the good old custom of today of putting up a bush when the roof was raised, I have always heard that that was the time the contractor or owner put up a keg of the juice that put Milwaukee on the map. Somehow or other, I always got there too soon or too late. However, I saw a building put up once with beer kegs as piers. Anyone knows that a healthy beer keg will stand an end pressure of many tons.

RAN INTO THE ROUGH OUTFIT. Along these lines (not on the beer question, but buildings and carpentry) I was employed by an Eastern concern that did a large business in house millwork of the higher class, special detail work, to be correct. I was sent to make measurements on a job out on Long Island, miles from a railroad station. While there I had meals at the shack, a name given the rough building where the mechanics boarded. They had made their own furniture, bunks, etc. They had an old colored woman for a cook and housekeeper, and in all there were sixteen men. The foreman told me he left the place Saturday noon and returned Monday morning to find the boys had found a place where booze was made. They got their supply to camp, played cards and sang songs (some music!), and then indulged in sports, such as wrestling, boxing, etc. He said they had a hole in the ground where they had been wrestling large enough to bury a horse. They scared the cook so badly she quit her job. Monday he was obliged to weed out some of the ringleaders on account of the disgraceful conduct of the week end. He had the new outfit there when I arrived. This being so far away from civilization, and the huskies' day and two nights off, with the aid of the juice, certainly must have pulled off a successful social.

READ AND OBSERVE MORE—TALK LESS!—So you see, in putting up a large house it requires not only many tradesmen, but many different kinds of tradesmen. I have traveled through the alleged wild and woolley West, have been in the midst of bad-men haunts, but this was the roughest looking layout I had encountered up to that time. A contractor who has a clean, law-abiding force of men working for him should certainly be proud of them, because all men are not worthy of their hire. Oftentimes I wonder if it would not be a good plan to take a certain period of an apprentice boy's time to teach him to read more and watch the conduct of some estimable carpenter. The difference between the clean-cut, genteel party preparing the plans and the class of men the same plans are destined to meet up with is sometimes as great as the distance between Cape Town and Kankakee.

I am now in a position where I come in contact with a few foreign contractors, especially Italians. To see the way some of their work is put up, to see how scale, proportion and construction are disregarded, is nothing short of a misdemeanor. Such men never read a paper or magazine. As the old adage goes, "Man's greatest ignorance is not knowing his own ignorance." I may be a bit severe on the question of mind improvement, but I claim that any man who talks more than he reads in twenty-four hours is an eclipse on progress. He misses the finer chords and bars in the music scale of culture. That is, in my estimation, mind you, the reason why so many men call the boss a swelled headed so and so. It is because he (the boss) has higher ideals, such as deep thoughts, good trade journal reading, newspaper stuff, and clean observation.

Now that I have the foregoing out of my system, I will bid you good-night.
Planning and Building a Modern Corn Crib
Equipped with Elevator—Part II

WHAT EVERY BUILDER SHOULD KNOW ABOUT THE NEW LABOR-SAVING OUTFITS FOR HANDLING EAR CORN AND GRAIN—BIG OPPORTUNITY AND GROWING FIELD FOR COUNTRY CONTRACTORS

By Herbert Shearer
(Continued from June Issue.)

Foundation of a Two-Story Granary

A concrete foundation wall is the most satisfactory. Four longitudinal walls are needed, besides the two walls across the ends. All outside walls may be comparatively thin, because the corn cribs are much lighter than the grain part of the building. The outside walls should be sunk deep enough into the ground to insure against heaving by frost in winter.

The two center foundation walls should be 16 inches in thickness. But it is not necessary to put them down so deep in the ground, because the ground under the center of the building will not freeze so deep. No definite rule can be given of the necessary depth for such walls. Frost penetrates deeper in some soils and localities than others when the winter temperature may be about the same.

There should be light concrete floors in the corn cribs and a heavy concrete floor in the driveway through the center of the building. The center of the building is made very strong and solid, but material is saved in every way possible in the construction of the corn crib wings.

Corn in the ear is less "liquid" than grain, so there is less side pressure. Also light material may be so easily braced in a building of this kind that heavy crib construction is unnecessary.

Roof for a Two-Story Grain House

An ordinary gable end roof seems to fit a two-story grain house and corn crib better than any other shape. The rafters are given a steeper pitch than ordinary to brace the building against wind pressure. Rafters put up in this way brace each other and brace every part of the building.

The high peak is needed when shifting the grain spouts to carry ear corn and small grains to the different bins.

A steep roof on a two-story granary is made to form triangular braces. Each rafter makes one side of two triangles, which together reach from the peak to both plates and are tied back to the long studding of the grain wall partitions. These partitions are tied together by the heavy grain-bin floor joists and the cross ties in the grain bins, so that the upper part of the building is a continuation of trusses, reaching from one plate to the other by way of the peak, and across through the middle.

Building grain houses of this character higher than the plan shown might run into greater technical construction details, but with outside studding 18 or 20 feet in length, the construction given in this plan is thoroughly satisfactory.

Advantages of a Two-Story Grain House from a Farmer's Standpoint

Here are some "talking points" that will interest farmers: Combination farm granaries and corn cribs are labor savers. When properly constructed they are easily made ratproof. Because such buildings usually are isolated from other buildings, and as there is no accumulation of straw or other inflammable material about, they are considered practically safe from fire.

Two-story corn cribs and grain houses utilize space to advantage, because one foundation supports and one roof covers a great amount of cubic capacity.

A two-story crib is built solid and permanent. When properly designed and nicely finished it is an ornament and a permanent asset to the farm.

Such buildings facilitate the separation of good seed from weed seed while throwing out illegitimate and shrunken kernels. The great advantage of planting pure seeds interests progressive farmers everywhere. The splendid work of Burbank and other scientists has shown that great profits are possible by the careful selection and planting of good seed.

Two-story corn cribs include elevating machinery to do the shoveling, thus eliminating expensive human muscle.

The small grains are stored on the second floor and are
spouted down to the fanning mill, which is propelled by the same power that runs the elevating machinery. A steady motion is maintained. There is no temptation to run the grain through too fast, because no one is being overworked. Men who turn the crank of a fanning mill hour after hour to clean grains are anxious to see the hopper emptied as quickly as possible. The result is that the work is often hurried and inferior seed is planted.

Two-story grain houses save one cent per bushel of corn at husking time. The price for husking and cribbing in the old fashioned way is four cents per bushel. With a two-story corn crib fitted with elevating machinery the price is three cents per bushel.

The upper part of the building provides perfect storage for seed corn, where it may be hung from the rafters in racks suspended in a dry atmosphere out of the way of rats and mice.

Handling Shelled Corn

Many farmers would like to shell corn at home, but are afraid to do so, because of the danger from heating.

With elevating machinery it may be handled so easily and transferred from one bin to another that the heating loses its significance.

At corn shelling time the machinery is placed in the drive-way and the corn is let out from the bottom of the corn crib into a long carrier which elevates the ears into the corn sheller.

The shelled corn is carried by the elevator to the bins overhead and the cobs are carried by the sheller carriers into wagon boxes or hog racks to be hauled over to the wood shed for kitchen fire wood. Well seasoned corn cobs make the most satisfactory summer fuel for the kitchen range.

Cleaning Grain for Market

Market grades of grain are published by the grain exchange and the prices are made according to grade. Farmers have never given much attention to the subject. The average
farmer has been in the habit of selling his wheat directly from the thrashing machine. His grain is docked accordingly.

Some farmers put part of their wheat in a bin in the barn and feed out of it by using a four quart measure. Dipping rattles the fine weed seeds down to the bottom so the best grain is fed out from the top of the bin. When it comes to seed time such farmers pull out the front bin boards and scoop up the bottom with all its accumulation of weed seed to sow.

Two-story grain houses will correct such abuses. At thrashing time the grain will be dumped into the elevator boot in the center driveway of the grain house and elevated by machinery to the bins overhead. After the rush is over, the fanning mill will be rigged and the grain spouted to the mill.

The grade turned out is without variation and is put into sacks by machinery ready to haul to market.

Sometimes the fanning mill is set to pick out 20% of the best grain to be used for seed. This seed grain is carried by an elevator to a seed bin on the second floor to remain until wanted for planting. Seed wheat prepared in this way is worth from $5 to $10 a bushel to sow. At the same time the selling price of the market sample may not be lowered a cent a bushel.

With a fanning mill properly adjusted to work by machinery, all kinds of grain grown on the farm may be separated and graded as wanted. The cheaper grains and weed seeds are put together in one bin for chopping for feed and the carefully selected plump seed grains may be sold at a high price to farmers who appreciate good seed.

The same elevating machinery may be employed to handle grain when it is being treated with formaldehyde to control smuts and other diseases that affect grains.

Shed Roof Poultry House

A shed roof poultry house, 16 by 12 feet in size, is shown in Design A314. It is constructed on the curtain front plan which supplies the most satisfactory ventilating system ever adopted in a poultry house. As the illustration shows, the glass sash are up near the roof in the high front to admit sunshine directly onto the scratching floor late in winter when the sun is high up overhead.

In very cold sections of the country sash may be fitted into the lower parts of the window frames, but always one must be left open for ventilation through the curtain. Thin five-cent cheesecloth is used for this purpose. Poultry writers sometimes make the mistake of calling it "canvas." Canvas means airtight or watertight. The windows might as well be boarded across as to fill in the openings with canvas.

The most approved ventilating windows have the muslin stretched over an inner frame, which fits into a heavier frame in such a way as to stretch the muslin tight and to permit easy removal for washing. When muslin is clean, the light gets through it as well as air. It looks cleaner and better to have the muslin nice and white.

As the season advances the upper windows are left open, as shown in the illustration.

The foundation is made of concrete for warmth and to prevent rats and mice and other vermin from getting into the poultry house.

All the hen furniture is made easily removable for cleaning. The droppings board supports the nest boxes. The boxes may be detached from the underside of the droppings board; the droppings board may be unhinged, and the roosts lifted off, so that the whole outfit is easily carried outdoors for cleaning and sterilizing by the action of the sun.

This plan makes a convenient little poultry house for either farm or village where good poultry is kept for eggs in the winter time.

This poultry house is large enough to hold 25 or 30 laying hens. It needs about that many together in the winter time to keep warm.

In making this house warm for a cold climate, it is necessary to make the walls double. A light 2 by 4 sill is placed on top of the concrete wall and it should be bolted down; 2 by 4 stud-aking is covered both outside and inside with building paper. The outside is finished with drop siding or clapboards. The inside is boarded with narrow matched siding without beading.

The roof is made warm the same as the sides, and in very much the same manner. Kiln-dried lining is very much to be preferred and should be thoroughly well nailed to prevent the joints from opening. The inside of a poultry house must have no cracks to harbor mites or lice.
Winter Hog House

This splendid little winter hog house provides seven comfortable pens for brood sows, where they may be kept on suitable feed during the winter and where the pigs may be farrowed and kept warm until they are several weeks old.

There are side doors to the south which open into the outside pens to give them considerable run for exercise.

The foundation of the building is of concrete with supporting walls which are connected by building them solid with the concrete floor. The walls project a foot above the floor, to protect the pigs against cold draughts, as shown in the cross section drawing.

An alley extends through the building from one end to the other. This alley is on the north side under the low slope of the roof. On the south side the windows are built high to admit plenty of sunshine directly onto the nests in winter. Each pen has two doors, one of which opens into the alley and the other into the small yard, so that the pigs may be easily transferred.

The concrete floor is made level, but each pen is provided with a wooden platform, which holds the straw and keeps the pigs well up from the cold concrete. Also each pen has a guard rail to protect young pigs.
A General Farm Barn

A farm barn designed to accommodate dairy cows and farm horses and to keep the two stables entirely separate is given in Design No. A298.

As shown by the perspective and floor plan, it will be noticed that the horse stable is built as an annex to the cow barn by extending the roof.

The barn is 52 feet in width and 60 feet in length. The cow stable proper is laid out with stalls facing outward. This is done to bring the horse feeding alley and one of the cow mangers to face each other, so the feeding may be done to better advantage.

The silo is placed on the cow stable side of the barn because more silage is fed to cows than to horses. However, if the silage carrier is placed right it may be run through the side alley to the feed alley between the horses and cows so the silage may be delivered on the other side of the alley.

The stable is of concrete up to the joists which support the barn floor. The concrete wall is 10 feet 6 inches high, which gives ample footings to reach below frost and also eight feet of headroom in the cow stable.

The floor in the horse stable is a foot lower, so that the horse stable has 9 feet of headroom, and the barn floor is made level clear across. This arrangement is better liked by some farmers than to have the jog in the floor above.

There are twenty windows in the stable and six windows to light the barn above the stable. Farmers are becoming quite liberal in the supplying of windows. Modern dairy stables demand a great deal of light, because light and sanitation necessarily go together. The advantages of more light in the stable have influenced a more liberal supply of windows in all parts of the barn, as well as other farm buildings.

This little barn furnishes stabling for 28 cows and 8 or 10 horses.

Stable Floor Plan of Barn, Showing Horse Stable Arranged by Itself in Lean-To Addition.
Explanation of Specification Provisions—Rough Carpentry Work

The Contractor shall set all the rough timber and work necessary to complete the building; he shall employ skilled mechanics to erect and set the entire frame work, sheath the outside walls, shingle all roofs, set the window frames, cover the entire outside of the building with tar paper, lay the wire mesh over the exterior walls, set all interior partitions, lay the rough flooring, set grounds at all door openings for Plasterers to work to, hang all sash, set all standing trim (casings) for doors and windows, build staircase, set the false ceiling beams and wainscot in dining room, hang all doors, set all finished hardware, lay the finished floors and set up all exterior finished woodwork. He shall supply and set mantels, glass, rough hardware, flashing, leaders and gutters, and all other material called for in this specification or shown on the drawings.

This is intended to show the scope of the work to be done by the Contractor.

"Grounds" are strips of wood that are nailed to the side of door openings and are set projecting beyond the Plasterer's lath the exact thickness of the plaster; they are a gauge for the Plasterer to work to. After the plaster sets they are removed.

(175) The attention of the Contractor is drawn to the notes written on the drawings, as they form part of the specification.

(176) Wood Forms. Build wood forms for the concrete foundation walls, and brace them securely to withstand the pressure of the concrete.

The forms are made with studs and sheathing boards, braced to keep them vertical while the concrete is being poured and set; the studs and sheathing boards are afterwards used in the construction of the building. The studs are not cut in lengths to the height of the cellar wall, but are allowed to project above, so there is no waste.

The Wood Frame of the Building

(177) All framing timber and floor beams shall be of spruce. The frame shall be firmly constructed in the following manner:

Spruce is specified for the framing, but other good framing timber can be used according to what is available in the particular locality.

(178) Spruce Girder. Set a 6"x8" girder to support the inside ends of the first floor beams, top of girder shall be 7' 2" above the cellar floor, running in a continuous line from the front to rear wall. The girder shall be supported by the foundation walls at the front and rear, also by intermediate brick piers not more than 8' 0" apart.

(179) Wood Sill. Set a 4" thick and 6" wide wood sill embedded in cement on top of and around all the foundation walls. The sill shall be set 1/4" back from the outside face of the wall, so that the outside face of the stucco will be continuous to grade. Sills shall be
Carpentry Specifications

halved together at the angles of the building.

The sill is the wood base on which the entire frame rests. The outside faces of the studs are set flush with the outside face of the sill. The sheathing (7/8" thick) covers both—the stucco on the frame is one inch thick, and the skim and dash coat on the exposed foundation wall is 1/2" thick—this will produce a continuous surface.

"Halving"—when two pieces of timber are to be fastened together, with the upper side of both on the same level, each piece is cut half way through and one laid over the other.

(180) First Tier of Beams. Upon the wood sill on one side and the supporting girder on the other set the first tier of beams—notching them down about one inch to bring them top flush, and space them 16" from center to center.

Set a 2" x 8" floor beam against the outside end walls instead of a 2" x 10" beam, to clear the wood sill.

Place double beams under all cross partitions, and set the studs for the cross partitions on these beams. This is to carry the weight of the plastered partitions.

At each side of the chimney stacks and staircase opening, set double floor beams.

These are called "headers."

At right angles, set double beams between the headers.

These are called "trimmers."

Headers and trimmers at a chimney form the space for a hearth, and at a staircase opening provide the headroom.

If the trimmers are over 4-feet long, hang them on wrought iron stirrups.

"Stirrups" are used to prevent weakening of the header by cutting into it to receive the ends of the trimmer beams.

Fill in the space between the headers with floor beams, and mortise and tenon them to the trimmer beams.

A "tenon" is a 2" x 2" piece which is left in the center of the end of a floor beam after a piece has been notched out from the top and bottom of the beam. This projecting piece is set into a 2" x 2" hole (called a "mortise") cut through a beam sitting at right angles to the beam with the tenon on it; this fastens them together. They are spiked in addition. By this method of framing the top of the beams are all level.

(181) Bridging. All beams shall be bridged, one row to each span.

Bridging shall be set before the rough floors are laid, nails shall be half driven, later, when settlement has taken place and before the ceilings are lathed, drive in the nails.

"Bridging" is set between floor beams; it consists of 2" x 2" pieces set in the form of a cross (X). Each is nailed to the top edge of one beam and the bottom edge of the other beam.

(182) Corner Posts. Set vertically on the sill a 4" x 6" corner post at each angle of the building, well spiked to the sill, and temporarily brace it to keep it in position. Corner posts shall be in one length from sill to eaves plate where possible.

(183) Studding. Set vertically 2" x 4" studs 16'0" long against the corner posts, and spike them securely to the post. This will make the height of the rooms 9' 3½" from finished floor to plaster face of ceiling.

(184) Second Story Plate. Using the upper end of the studs (set against the corner posts) as a bearing, set the 4" x 4" second story plates horizontally around the entire building; fit the plate ends close to the corner posts, and spike securely.

(185) Studding. Between the wood sill and the second story plate, set vertically, 2" x 4" studs 16'0" from center to center driven in tight. Set double studs at door and window openings. Nail the ends of studs to the sill and plate, and wherever possible nail the studs to the floor beams to form a tie across the building.

(186) Second Tier of Beams, Studs, Etc. Set the second tier of beams in a similar manner to the first tier; notching them down and framing with headers and trimmers around staircase opening and chimney stacks. Set vertically, 2" x 4" studs 10'0" long against each corner post, and on the upper end of these studs set the eaves plate 4" wide and 3" high. Fill in between the second story plate and eaves plate with studding and double the studs at all window openings. This will make the height of the room 9' 3½" in the clear.

(187) Second Story Ceiling Beams. Set the 2" x 6" second story ceiling beams on the eaves plate at one end and on the inside partition at the other end.

(188) Roof Rafters. Set one end of the roof rafters on the eaves plate and the other end against the ridge piece, spike them securely at both ends. Rafters shall be set 20' from center to center.

(189) Roof Framing. Frame the roof as shown on the elevations. Set 2" x 10" rafters at all hips and valleys, and frame for saddles at the back of all chimneys.

A "saddle" is formed to prevent rain water lodging at the back of the chimney. Set 3½" x 10" boards along the valleys.

A "valley" is the inside angle formed by the joining of two planes of a roof.

(190) Shingles. Cover all roofs shown on drawings with shingles, forming Boston hips and ridges.

"Hip" is the outside angle formed by the joining of two planes of a roof. "Boston hips" are formed by setting an edging of shingles at right angles to the line of the hip or ridge.

A "ridge" is the top line of a roof formed by the meeting of the sloping sides.

Shingle Nails. All shingles shall be set with galvanized shingle nails.
Carpentry Specifications

(191) Deck Roofs. Deck roofs shall be covered with heavy canvas painted on both sides. A "deck roof" is a roof with just enough pitch to shed rain water to the gutter.

(192) Rough Floors. Lay rough floors diagonally over the entire first and second floors. Rough floors are laid diagonally, as the rough and finished floors should not be laid in the same direction; if the rough floor is laid diagonally, the finished flooring can be laid in either direction.

(193) Rough Heads and Sills. Between the double studs at door and window openings, set rough heads and sills—size 4"x 4" (2" x 4" doubled). The heads shall be set on the top of one of the vertical studs on each side of the opening, and between the top of the head and the plate set in a 2" x 4" piece driven tight.

(194) Braces. Cut in 2" x 3" horizontal braces at half heights in all interior partitions. Set 2" x 3" braces in the outside partitions in a continuous diagonal line between the studs.

Braces stiffen the walls, and prevent the plaster cracking.

Trussing Over Doors and Windows. Truss over door and window openings that support floor beams. "Trusses" are diagonal pieces set to transfer the weight over the center of the doors and windows to the double studs at the side of the opening.

(195) Furring. Fur down part of the ceiling under bathroom 12" where directed or necessary to give room for plumbing pipes.

"Furring" is framing down to give extra space.

(196) Construction of Exterior Walls. The outside walls shall be constructed with vertical studding covered with horizontal sheathing, over which lay two ply tar paper, secured with plasterer's lath nailed on vertically at the joints of the paper. Over the entire exterior surface set 22 gauge wire cloth with V bars. Set metal beads at all corners of the building. The stucco shall be spread over the wire cloth. (For stucco see Mason's Specification.)

Tar paper is a stiff paper saturated with pitch. Two ply means two sheets pressed together.

Gauge is the diameter of the wire forming the cloth. The gauges used for outside stucco are 20, 22, 24 and 26. 20 gauge has the largest diameter and the 26 the smallest.

"V" bar is a continuous horizontal stiffening bar formed like a V, which allows a key for the stucco between the wire cloth and the sheathing.

Summary of Timber Sizes

(197) Floor beams 2" x 10" set 16" on centers. Girders under first floor beams 6" x 8".

Beam bridging 2" x 2" two rows to each span. Sills 4" x 6".

Corner posts 4" x 6".

Studs 2" x 4" set 16" on centers. Door and window studs 2" x 4" doubled. Plates 4" x 4".

Roof rafters 2" x 6" laid 20" on centers. Ridge piece 2" x 8".

Shingle lath 7/8" x 2" set 5" on centers. Shingles 18" red cedar shingles.


Piazza beams 2" x 8".

Horizontal furring for piazza ceilings 2" x 4" set 16" from center to center.

The piazza rafters slope and the piazza ceiling is horizontal, so the furring is necessary for nailing. T. & G. is Tongued and Grooved. N. C. pine is North Carolina Pine.

# Excelling King Solomon's Temple

What is considered one of America's most beautiful and artistic buildings is the new Scottish Rite Temple, Washington, D. C. It has already been in course of construction more than four years and will cost about $1,750,000 when completed.

This new structure is claimed to be not only the most beautiful ever erected by the Masonic order, but it is also the only exact duplicate of King Solomon's Temple that has ever been built. Norcross Bros. Company, of Worcester, Mass., are the contractors and John Russell Pope, a New York architect, prepared the plans.

The building is composed of a lower rectangular part which lies behind a wide sweep of steps leading from the street up to the main entrance which is, in reality, the third floor. Rising above the rectangular base, the central part of the building is square, surrounded by a colonnade of thirty-three monolithic columns, each thirty-three feet high, supporting a classic frieze, surmounted by a rectangular pyramidal roof. The steps leading to the main entrance are 200 feet in length, larger than those of the Capitol building and said to be the largest in the city.
Self-Adjusting Nut and Pipe Wrench

Did you ever try to reach a nut or a pipe that was in a rather awkward position and spend a lot of time trying to get your wrench adjusted to fit? The wrench shown here, which has been recently placed on the market, is designed for just such an emergency. It will automatically adjust itself to the pipe or nut on which it is being used and can be operated like a ratchet wrench in unhandy positions.

The jaws open as the handle is bent back, as can be seen from the illustration, and the grip increases with the pull on the handle. For this reason it can be used as a ratchet wrench. The makers say that it is practically unbreakable, as it is made entirely of high carbon steel. The play in the jaws allows of a wide range of sizes of pipes and nuts.

Liquid Gas Cools Ice Box Besides Furnishing Heat and Light

What next? A New York concern is compressing and shipping 3,000 bottles a day of natural gas in liquid form. It has five times the heat value of ordinary city gas, and besides in expanding from the liquid form it has a by-product refrigerating action that is valuable.

The illustration shows a practical application of "Liquid gas" in the kitchen. It should be mighty interesting to the builder who wants to keep up with the times and all the latest developments that add to the comforts of a house.

"Liquid gas" is a natural or "wet" gas that has been compressed to about two or three hundred pounds pressure to the square inch. At this pressure it forms into a liquid that can be stored in iron containers. If the pressure is reduced the liquid changes back into its gaseous state.

The illustration shows how advantage is taken of this expansion to use the gas for refrigerating purposes before it is used for fuel. The gas is led from the container, which may be placed in a cabinet in the kitchen or in a pit just outside the wall, to the refrigerator, which should be placed as close to the container as possible so that no refrigerating effect will be lost. The gas is led through a copper coil in the ice space of the refrigerator or through a pan of water which will freeze. The gas goes from here to the lights and the gas stove and also the water heater, as shown in the illustration. The more gas used the more ice will be formed in the refrigerator. This added feature of making ice is done at absolutely no extra cost, because it is not necessary to use any more gas than ordinarily.

The plan is especially suited to an isolated residence. The owner receives the container by freight and connects it up; when it is empty he returns it to be refilled.

C. F. Herington.

Three Complete Die Stocks with the Bulk and Weight of One

One of the most useful and efficient tools that has come out recently is a pipe stock equipped with three sets of dies so that three sizes of pipe can be threaded without change. The stock is made in a hexagonal shape with each of the three dies and its accompanying guide occupying two opposite faces. The dies that are furnished with the stock are %, %, and % inch. Any size standard dies from % to 1 inch can be used.

The die is placed at quite a distance from the guide and consequently the pipe will be threaded perfectly straight. The different size dies for each of the sizes of pipe will eliminate wavy threads, which are often caused by the lost motion in stocks that are equipped with cams and levers so that one die can be used for all sizes.

All the dies, set screws, and bushings are standard so that they can be easily replaced, which should be a big advantage.

A Practical Cooler for the Home

There has recently been placed on the market a cooler that should be very practical for homes having a good supply of cold running water.

It is cooled by water which is run through a series of coils that are in the shelves. These coils are connected to the service pipe for the house and all the water that is used must first pass through the cooler before reaching the faucet. In the smallest size of these coolers there are 65 feet of pipe, which the manufacturers say will keep the temperature within two or three degrees of that of the water. The water in the pipes can be changed completely in five minutes by running a very small stream through the faucet.

An Effective Saw Guard

The accompanying illustration shows a most effective saw guard, to protect the operator. This guard is attached to the saw table by means of a clamp at the right-hand side of
the table. It is made of square steel, giving it great strength and rigidity, and it is equipped with case-hardened steel rollers in the sleeve carrying the hood, making it self-adjustable, and therefore, very economical.

The rollers allow the hood to raise and lower automatically with the lumber being run.

Frank C. Perkins.

Unique Vertical Drafting Board

The accompanying illustration shows a novel vertical improved drafting board developed at Nashua, N. H. In many a progressive drafting room one can now see nothing but vertical boards, and even in the manager’s and chief engineer’s office they are in service.

With this board one can draw either sitting or standing. No matter in what position, the draftsman can bring any piece of his work before his eyes, or wherever the convenience requires it. The board is tilted at an angle which has been fixed by experience.

It is pointed out that the tools are not in the way, and the entire drawing is visible and not covered with tools, papers and dirt. Still the tools are handler than with any other method of drawing. They are placed on the shelf that moves with the parallel rule and this saves many unnecessary movements.

It will be seen that the rule can be set at angle and moved up and down parallel to whatever position it was set originally. The balancing means are concealed and move entirely noiselessly. The frame is of metal and can be taken apart. It is enameled, and therefore can easily be kept clean. The draftsmen with the vertical board enjoy health and consequently their efficiency is greater. Besides, the new device saves them valuable time and permits greater accuracy.

Frank C. Perkins.

Clamp Will Hold Grade Boards

A clamp has recently been designed by a New York man which will hold grade boards in place and at the same time will allow of their being adjusted. The total arrangement will consist of a grade board, of any length and any size up to 2 inches thick, two 1-inch iron rods, and two clamps. The form of the clamps and the method of using are shown in the illustration.

The inventor claims that there are many advantages to be gained by the use of this clamp. The grade boards can be easily set and accurate grades determined; the boards can be adjusted to any span or any height; the iron rods that are used can be driven into hard or frozen ground; and old pipe or reinforcing rods can be used for this purpose. The clamps are galvanized so that they will not rust. They appear to be a convenience and help to contractors that will bring them into wide use as they become better known.

Sanitary Filter and Aerator for Cistern Water

A device has recently been perfected for filtering and ventilating the water that is put into the cistern.

The filter is attached to the house and is all above ground, so that it will be easy to get at and keep clean. The water, in going through the filter, first passes through a screen drawer pan (A), which will remove the coarsest material. The second strainer is of cloth (C) and removes all the rest of the material in suspension except the very fine. The best part of the filter is composed of a charcoal layer (E). Below the filter is a ventilator in the conductor pipe that keeps the water and also the filtering materials well ventilated. The conductor pipe goes directly to the cistern from here.

Staying Away More Heroic

"You say you’re a moving-picture hero?"

“Yes, my wife makes me go to them every night."

Suspicion Points His Way

York County Farmer (bursting into the village inn)—“What d’ye think, Silas? The bones of a prehistoric man have been found on Jim White’s farm!”

Innkeeper—“Great Gosh! I hope poor Jim’ll be able to clear hisself at the coroner’s inquest!”
A New Wrinkle for Hens' Nests

To the Editor: Plainfield, N. J.

One of the simplest devices for a chicken house, to make, for cleanliness and ease in collecting eggs, is shown in the accompanying illustration. It consists of an opening 14 inches high by 60 inches long in the side of the chicken house, to which is affixed, on the outside of the house, a box containing four nests. The box, as seen, has a slanting roof which is provided with hinges and a deep lipped edge on its three sides. A screw eye and hook or a lock can be used for keeping inquisitive children or grown-ups from tampering with the "hen-fruit."

Using this form of nest, one not only eliminates the necessity of going through the chicken yard or house to collect the eggs, but one also saves quite a little space in the chicken house itself.

Poultry fanciers claim that one nest should be allowed for every four or five hens. The nest should be not less than 15 by 12 inches and it is well to have them about 14 inches high. A 6-inch board should be run along the lower part of the nests. Let this project up from the bottom about 3 inches, so as to form a lip to retain the straw from falling out.

Ralph C. Davison.

Unsqueaking a Floor

To the Editor: Mimico, Ont., Canada.

In answer to inquiry No. 2 by Doniphan Lumber Co., in regard to the best method of putting in place the top and last tread in a housed string, there are two ways that I do this job.

First,—before finally fixing top newel, raise the stair bodily and slip tred into newel and string housing.

Second,—Cut top tread % inch short and slip it % inch each way (¼ into newel and ¼ into string). In either case top riser can be slipped up the back and fixed by a pair of folding wedges.

Answering inquiry regarding squeaky floors, by C. P. Edwards, how to take out the squeak. The squeak may be caused by shrinkage or by joints of sub-floor coming between or not on the joist. In case of shrinkage, I find face nailing best and stop nail holes with wax, which never shows.

In case of joints between joist being the cause, place a piece of 1 by 6-in. across the joint, then place struts 1½ by 1½ inch between joist, as per sketch. This method can only be used on the ground floor when you can get at the under side from the cellar.

Thos. W. Everett.

Ventilating a Kitchen

To the Editor: Chicago, Ill.

I would be very much obliged if you would publish an article on how to ventilate a kitchen of one story. Each time the party cooks it causes the ceiling to sweat and this causes the paint to peel off. What would be the best way to ventilate this kitchen so as to stop the sweating?

J. Garwood.

West Has Nothing on East

To the Editor: Chico, Cal.

I want a word with Grant Bros., of Atteboro, Mass. It's a long way across this big U. S. to you, but I'm going to reach you. That shingle story gets you, but you turn to page 102, May issue, and see where Mr. Wm. (Golden) Rule used nine tons of nails in a 28 by 32-foot house—18,000 pounds, 180 kegs, $540 worth! Grant Bros., let's stay near our respective sea coasts! The wind must blow something awful in Illinois. That shingle man should have another chance.

L. Van Vlack,
Contractor and Builder.
Tackle for Barn Raising

To the Editor: LaFargeville, N. Y.

You remember the old time barn raising, when all the neighbors for miles around came together to help raise the barn frame. The women came, too, for it was a great time and there must be a good supply of refreshments for those who did the hard work and more for those who did not; for the fact was that a few of the men did most of the work and some worked a little and ate a great deal.

But times and customs change. Some for the better, and some for the worse; anyway, we do it differently now. Instead of a large gathering of neighbors, mostly farmers who do not enjoy climbing, a few men accustomed to the work will set up a large barn frame with the aid of one or two teams, ropes, chains and tackle blocks. For one tackle get four to seven pulleys and a man who can tie knots.

It is well to have a building already up to which you can hitch the tackle, but if not, then you may use shears, or some similar device. You may use two of the rafters for this by putting a chain around near one end, placing them in a V shape with the point toward the bent to be raised, or you may set up a frame and fasten the purlin onto it. This frame may be two posts set into the ground with a timber across near their top. In either case, you will need a deadman, or anchor, for the pulley through which the rope runs. Have guy lines, so that you can hold the bent when it gets to place; or it may go on over.

When the first bent is up and braced, you can hitch to that to raise the others. This method works with either timber frames or the modern plank truss. With heavy frames, it is well to have one tackle on each side with a team on each tackle, or you may wish to use the heavy tackle to lift with and hitch the lighter one onto that to draw with. By this means a large bent can be raised with one horse. If you wish to put a chain or rope across between two points and hitch to the middle of it, you should give it plenty of slack, so that it will form an acute angle or V shape, as there will then be much less strain on it than if it were straight across.

The proper place to fasten the ends of this bridle, as it is called, will depend on construction of the frame. Generally the short tie just below the plate will be right. If there is much timber above this point, it may be well to hitch higher.

Some of you may think that while it is all right to use tackle to raise the bents to place, one must have several men to help put the plates on; but did you ever notice that a few men do the actual work in putting on the plates? There is a better way to do this, safer and easier for all, besides giving a chance for those who do not wish to go aloft to help. The way to do it is to use gin poles, not great long, heavy ones, to reach from the ground up, but 4 by 4's, 12 to 14 feet long. Let the lower end sit on a plank across the corner formed by a beam and a girt, or you may depend entirely on two chains around the 4 by 4 and the main posts. Pull the purlin plates up and let them lie on the beams; then put the main plates on. The gin poles may then be fastened to the purlin posts to raise the purlins to lie.

Sometimes the purlin posts are not raised with the main bent, but are set up afterwards. Sometimes we put the purlin onto the posts and raise them as a bent, putting the beams in afterward.

In almost any case you can use rope and tackle to good advantage, save hard work and avoid danger; but you should have reliable, careful men.

John Upton.

“Soldiering” on the Job

To the Editor: New York City.

Yes, I suppose I may as well admit that I used to “soldier” when I was a near-carpenter. I was one of the reasons why the contractor failed. I was one of the fellows who got more than he earned. I can’t say for sure that there were other “soldiers” on the job, for we all hate to admit it, but as for me, I know I was one.

The most distinct soldiering job that I did was one hot summer’s afternoon when the temperature was well up around a hundred in the shade. We were putting up a reinforced concrete structure and I was just an ordinary “rough” carpenter. I never got to be a real fancy carpenter. I didn’t have it in me.

Charlie, the bow-legged boss, saw that I was trying hard to pretend that I was busy “inspecting” the work that my superiors had done. I would hit a brace here and there with my hammer, strike a nail that was already driven, sight along the wooden columns carefully, and then get a drink. I visited the water pail frequently. I consulted my watch often. I was the last to begin work in the morning and the first to drop my hammer at night. If there was anything I thought I despised then, it was work. If there was anything I thought I would ever love, it was leisure.

So, Charlie found a different job for me. He showed me where I could busy myself nailing braces under a girder box “just like some others” which he pointed out.

The job was a “cinch.” It was ideal for loafing and forth-
with I decided to spread the job over the remainder of the day. All I had to do was to saw a batch of braces about a foot long with beveled ends, fill my sack with nails, lie on my back on the prearranged scaffolding beneath the boxes and lazily drive my nails. I hit each nail about a hundred times—light, gentle, soft, pleasant, lazy taps. My mind was at rest. I was as good as in heaven. The sun wasn't shining on me and I wasn't exerting myself enough to feel uncomfortable in spite of the high temperature. Even my conscience (the little I possessed) didn't bother me, for, wasn't I working?

Charlie, on the roof, looked down at me every once in a while and seemed satisfied. He said nothing. I wonder, now, whether or not I really fooled him.

I made the job last most of the morning and all afternoon. I didn't want to finish it at all, but it finally ended of its own accord, so it seemed, and I had to give myself up to Charlie again for something less comfortable to do. Well did I know that if I didn't at least pretend to be busy, Charlie would tie the can on me.

Seriously, soldiering is a bad thing. The contractor loses money, and the soldier himself loses his own self-respect.

On analyzing my own feelings, though, and thinking the whole affair over carefully, I would still blame Charlie. His nature was harsh and unsympathetic. I was actually "afraid" of him and hated to admit to him that I didn't know enough about carpentry to go ahead with my work without minute instructions.

I believe that if foremen would be more instructive in their methods, and take young carpenters into their confidence more freely, there would be less soldiering, for, isn't education the solution for most of our problems? N. G. NEAR.

School Room Window Regulation

To the Editor: Morse, Sask., Can.

What is the amount of floor space required for each pupil in a school; also the amount of square feet of window light needed? I enjoy reading your valuable paper and would not be without it. Would like to see more space given to architects' experiences.

H. R. BISLOW.

Answer—We do not know that there is any special amount of area allowed for each pupil in a public school, though some city building codes may cover this point. It is more common to specify the number of pupils which shall be placed in a room of a given size, allowing plenty of width for aisles and free floor space where needed in the room. It is commonly figured that a single desk for a pupil will occupy about 6 square feet of floor space.

The Chicago Building Ordinance states that the total glass area of outside windows and skylights of each class room, recitation room or study room, shall not be less than one-fifth of the floor area of such room.

Also that class rooms, recitation rooms and study rooms that have exterior windows on one side only, must have the top of glass in such windows at a height above the floor of such room of not less than one-half of the distance to the opposite parallel wall or partition.

Such rooms having exterior windows on two opposite sides of the room shall have the top of the glass in such windows not less than one-fourth of the distance between walls in which the windows are placed. The height of windows in corner rooms having windows in adjacent walls, shall be computed from nearest wall or partition to opposite window.

A. W. Woods.

Van Ornum's Power Shop

To the Editor: Canby, Minn.

I am sending you photographs of my shop, inside and outside. I have a Parks ball bearing saw machine, and it is Al. The shop is 14 by 24 feet. I have made a lot of money in this little shop.

I have taken the AMERICAN CARPENTER AND BUILDER for 7 years, and like it very much.

W. S. VAN ORNUM.

Cuts for Gambrel Roof Rafters

To the Editor: Tyndall, So. Dak.

I wish you would advise me how to cut the rafters for a gambrel roof. The building is 60 feet long by 28 feet wide and to have 16 foot posts.

M. P.

Answer—The accompanying illustration is a good proportion to use. Both set of rafters are cut on the same figures though reversed; but instead of making the cut at the knuckle, simply lay off the lines for the cut and to this line apply the square that gives the 45 degree angle, which will give the proper angle for the cut—or the angles can be taken direct from the diagram.

A. W. Woods.

Diagram of Gambrel Roof.
A Mystery Table

To the Editor: Buffalo, N. Y.

A "mystery" table has been constructed by a Medford, Mass., carpenter, Ernst Hagberg. One of the photos shows the table as it appears when partly opened, the other shows it when it is closed. It is of mahogany, inlaid with ebony, boxwood, and walnut. It is both useful and ornamental, and can be used as a card or checker table.

It will be seen that beneath the checker board, which can be raised and removed, are small compartments which can be used for cards, chips, checkers and the like. To reach these compartments, one has but to touch a button, hidden from sight underneath the top of the table, and they open to view. On all sides of the table, including the top and the pedestal, are other compartments, which can be opened at will, by pressing the buttons beneath the top. Each drawer has a spring at the back to press it out.

It is stated that altogether in the table, there are 29 drawers, one door, two shelves, five covers, and 1,288 cubic inches of empty space for the depositing of different things. It may well be termed "A Table of Mystery" for the pockets and drawers that lock and conceal each other are invisible. No one would think for a moment, unless he knew of the buttons, that the table held so many compartments. As these pockets are made on uniform measurements they permit an interchange in positions and a puzzling readjustment.

Wonderful Table Built by, Mr. Ernst Hagberg of Medford, Mass.

The maker spent ten years of his spare time studying its design and dimensions, and completing it, and the effort was no small one.

Frank C. Perkins.

Vouches for Fast Western Shingling

To the Editor: Los Angeles, Cal.

I see by the May number of the American Carpenter and Builder that some of your subscribers doubt what Mr. O. P. Pierce says about fast shingling. I know that a professional shingler can lay ten thousand shingles in ten hours. I have seen it done time and again. I have been working at the carpenter's trade in Los Angeles for the last six years, and I have often seen contract shinglers put on one thousand for every hour they were working. They certainly work fast; just like we used to say in the East, "Fighting bumble bees."

They have called shoes, and can walk all over the roof. They have a stool to sit on, a gauge and a lather's hatchet, and they don't use a chalk line at all. They carry two and three bundles of shingles at one load. They work at it all the time, year in and year out. However, they take eight to ten courses at a through.

Irvine E. Little.

Cutting Extra Windows in Concrete Wall

To the Editor: Monroe City, Mo.

I am getting ready to put a basement under a church which has a 15-inch poured concrete foundation wall. I want to cut seven window openings through this wall. Can you tell me the best and cheapest method of doing this work?

W. L. Bond.

Answer—The only way that we see that this could be done is to drill holes for the openings and break out the concrete inside of the line of holes around the opening. This will be a hard job in a wall of this thickness, and care will have to be taken to see that a sufficient height of wall is left over the openings where any considerable load from the structure above is carried at these points. You must understand that in breaking the concrete out of so thick a wall you stand a pretty good chance of cracking other parts of the wall where no reinforcement has been used in the construction.

The Boss Carpenter.

(Correspondence Dept. continued to page 90.)
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J-M Transite Asbestos Wood can be sawed, nailed and otherwise handled like wood, and can be grained and finished to match surrounding trim if desired.

Write for booklet, covering these subjects. They will be splendid things to have on file.

JOHNS-MANVILLE PRODUCTS

J-M Drinking Water System
J-M Transite Asbestos Wood
J-M Asbestos Cloth and Vitrebestos
J-M Architectural Acoustics
J-M Waterproofing Materials
J-M Mastic Flooring
J-M Asbestos-Sponge Felted Pipe Covering and Sheets
J-M Asbestocel Pipe Covering and Sheets
J-M Sectional Underground Condult
“Nora” Enclosed Fuse Device
J-M Corrugated Asbestos Roofing
J-M Regal Roofing
J-M Asbestos Felt
J-M Asbestos Slater’s Felt
J-M Asbestos Roofing and Insulating Felts
J-M Sound Deadening Felts

Cold Storage Insulation
J-M Weatherite Paper
J-M Asbestos Fire and Damp-proof Flooring Felts
J-M Cork Floor Tiling
J-M Washerless Faucet
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WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
There's a difference between covering steam pipes with "pipe covering" and insulating a steam line with the proper materials.

The business of Johns-Manville Heat Insulation service is to recommend, sell and install a specific INSULATION for a specific requirement.

Steam insulation is a study in heat economy and not the dispensing of so many feet of pipe covering so many inches thick.

The purpose of J-M Heat Insulation service is to furnish efficient insulation on your job so that when the work is done the system is as efficient thermally as it is possible to make it.

Every variety and combination of insulation is manufactured by the Johns-Manville Co. and Johns-Manville specialists are ready to recommend the proper insulation for your work. Why not let them confer with you?

The noise nuisance in buildings is effectively eliminated by the use of J-M Keystone Hair Insulator.

This material has proven indispensable in buildings where the localizing of noise is paramount. Such as in apartments, hotels, residences, office buildings and factories.

It is easy to apply and its cost is such as to make it a practical improvement to any structure.

J-M Keystone Hair Insulator is made of chemically treated cattle hair quilted between layers of insulating felts.

It is just as effective when used as a weather sheathing in walls. Absolutely inodorous and vermin proof.

Write for booklets on these subjects today.
Herringbone Armco Iron Lath, made of the most Rust-Resisting Iron known, was used by Edward Grey, Architect, in the beautiful Beverly Hills Hotel, Los Angeles, California.

Herringbone Saves Materials

On the scratch coat alone there is sometimes as much as 30% reduction in the plaster required as compared with other methods. The material goes further because the flat ribs of Herringbone spread the plaster rather than cut it. As a further result Herringbone has a broad grip and holds stucco and plaster. A Herringbone job remains good.

Herringbone all comes painted—goes into the wall rustless—cannot discolor the coat.

Rigid Metal Lath

affords a firm surface for the trowel. It speeds up work and ensures an even coat—no thick and thin spots to dry unevenly and perhaps crack. Wiring between studs is unnecessary because of the stiff interlocking selvage edges.

The "HERRINGBONE BOOK" FREE

will tell you the whole truth about Herringbone. Send for it today and tomorrow you will use it. Its worth to you has no limit except you fail to use it and—it is Free. Ready for you, today.

The General Fireproofing Co.
6700 Logan Ave., Youngstown, Ohio

Makers also of Self-Sentering—the concrete reinforcing that eliminates the need of forms

Herringbone Armco Iron Lath was used also in this fire-resisting and time-defying residence in Los Angeles. Lester Moore, Architect.

Wood Carving

To the Editor:

We are enclosing a photograph of a wood carving that should be interesting, as it is at least appropriate and timely, considering the conditions across the ocean. This piece of work has been named "The Dying Soldier" and is the work of Mr. O. O. Finwall of this city.

It represents considerable time and patience and should be interesting. It is made entirely of wood.

H. W. Ross Lumber Co.

Fault of the Plaster, Not the Wallpaper

To the Editor:

I just completed a house and did not have any trouble with same until decorating was started. After some of the paper had been placed on the walls it became loosened and took with it the finishing or putty coat. We had trouble of this kind in several places in two or three different rooms. Could this trouble be caused by the paperhanger not sizing the walls properly before putting on the paper? If you can give me any information as to the probable cause of such trouble as this I would consider it a great favor.

M. A. Schaefer.

Answer—The trouble you have had is probably due to the manner in which the finishing or putty coat was placed over the second coat or brown coat. It is possible that the finishing coat was put on after the brown coat had become so dry that it caused the water to be drawn from the finishing coat into the brown coat, and leaving the finishing coat in a weakened condition. Or, poor material may have been used.

M. A. SCHAEFER.
The Corbin Unit Lock is shipped with knobs and escutcheons attached and is applied by the carpenter just as received. It is only necessary to cut the stile as shown, slip the lock into the slot and drive the screws through the escutcheons. The knobs never bind and the locks always work perfectly. Contractors say their good men can attach a Corbin Unit Lock in ten minutes. Ask any dealer in Corbin hardware to tell you about the Corbin Unit Lock, with the keyhole in the knob, or write to

P. & F. Corbin
The American Hardware Corporation Successor
NEW BRITAIN, CONN.

NEW YORK       CHICAGO       PHILADELPHIA
Exhibition Bungalow Graduates into Regular Home Class

Any one who saw the Michigan-Wisconsin Bungalow when it was on exhibition in Chicago and then in New York, would be surprised to see it located on Long Island now as a regular home. Most exhibits are made for temporary purposes; but this bungalow was built substantially, so as to do justice to the fine woods that were employed in different parts of the house; so it was remarkably well constructed and artistically finished. It was first placed on display at the Forest Products Exposition in Chicago, and later at the Grand Central Palace in New York.

The bungalow was designed by the Chicago office of the Radford Architectural Company and was constructed of the following materials:

- Outside bass wood siding, and northern white cedar shingles;
- The living room finished in Cadillac gray elm, stained early English;
- Flooring red clear beech;
- The dining room birch with slab of seamless marble.

---

Waterproof Stucco with CERESIT

Make the stucco walls of your buildings as water-tight as welded steel! Simply throw a small quantity of Ceresit Waterproofing Compound into the water used to temper the cement plaster and you have walls as impervious to water as if laid with one slab of seamless marble.

You can make basements as dry as attics, and secure permanent and economical results with Ceresit in all concrete, cement and stucco work.

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W. S. WARREN, Architect. La Grange, Ill.

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I. M. GILBERT, Architect. Hinsdale, Ill.
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"Successful Stucco Houses"

and

"Clinton Handbook on Lath and Plaster"

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CLINTON, MASS.

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is composed of materials in powder and liquid forms, which, when mixed and spread, form a tough, seamless mass over the entire floor including cove and base, if desired, thus providing a sanitary, durable floor without joints and easy to keep clean.

It can be laid on bases of concrete, wood or steel. Beautiful border designs and terrazzo effects can be secured and its seamless, smooth finish makes it especially adapted for hospitals, schools, theatres, office buildings, public buildings, private homes, apartments and manufacturing establishments.

Our Kellastone Composition Flooring Book goes into details in a brief, interesting way. If interested, ask for a copy. It’s yours for the written word.

The National Kellastone Co.
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CHICAGO, ILL.

red birch floor; the bedroom white maple, natural finish, with bird’s-eye maple flooring; bathroom white birch, with white maple flooring; Cadillac grey elm, natural color, in kitchen, with unselected maple floor; and the porch floor and ceiling of tamarack.

The bungalow was given to the winner of a prize contest after the exposition at the Grand Central Palace in New York. A coupon was attached to each ticket of admission and on the last day the drawing was to take place, but was interrupted by the police who had a grudge against what they insisted was a lottery. The drawing was held later outside of New York and the bungalow was won by a Long Island architect. Mr. J. C. Ellis says that it is now located at Saint James, Long Island, and has been much admired. It is about 1,500 feet from the railroad and near the famous estate of the late Mayor Gaynor of New York City.

*Figuring Sash-Weights*

To the Editor: Ashland, Ohio.

I would like to have a list of sash weights necessary for different sizes of window sash for use in my work. If you do not have this information, kindly tell me where I can obtain it.

Mack Smith.

Answer—The weights ordinarily used for balancing windows are made of a cheap grade of cast iron, generally cylindrical in shape, with an eye cast in the upper end to receive the window cord. Such weights are never of greater diameter than the thickness of the sash to be held.

The length of the sash weight in inches required to balance a given weight may be found by dividing the given weight by the values in the following table. This table is taken from “Kidder’s Architects’ and Builders’ Pocket Book.”

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<td>4</td>
<td>3.26</td>
<td>4.10</td>
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</tbody>
</table>

To the result thus obtained one inch should be added to allow for the eye of the weight.

The approximate diameters of common stock weights are as follows: For weights of 8 pounds and under, 1 1/2 inches; 8 to 16 pounds, 1 3/4 inches; 16 to 20 pounds, 2 inches; and 20 to 30 pounds, 2 1/2 inches.

The principle involved in determining the weights to be used in a given sash is that the weights in passing over the pulleys at the top tend to counterbalance the weight of the sash itself. Thus, it is seen that the amount of the two weights should be about the same as that of the sash. Generally, the weights for the upper sash are used about one-half pound heavier than the sash, while those for the lower end are about one-half pound lighter. This difference in value tends to hold the window closed, but does not impose any considerable weight to be lifted to open the window.

In determining the weight of the sash itself, the weight of the glass may be used as one pound per square foot for single-strength glass, 1 1/3 pounds for double-strength glass, and 3 1/2 pounds for plate glass. To find the weight of the wooden sash, Kidder gives the following rule: Add together the height and width of each sash in feet and multiply by 2.1 for 2 1/4 inch sash, 1.2-3 for 1 1/4 inch sash and 1 1/3 for 1 3/4 inch sash. If the exact weight is desired it can only be obtained by weighing each sash carefully.

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We manufacture several styles of Asphalt Roofings, the best known being Vulcanite Asphalt Shingles. Vulcanite Ornamental Roofing in rolls, Vulcanite Continuous strip shingle, Vulcanite-Tile, Vulcanite Roll Roofings, etc. They come in rich colorings and each represents the best value.

When you roof a building with Vulcanite you and your client can feel satisfied that there is no better roofing made. A good roofing job is an important factor on every building and will be a permanent advertisement for you as a conscientious Builder who uses only the best and most serviceable of materials.

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CHICAGO, ILLINOIS

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
If Door is Warped, Warp It Back Again
To the Editor: Toronto, Ont.

On page 83, June issue, I notice the question of Forrest Reichard regarding a door straightener. I agree with him that it is the meeting of unusual conditions and rising above them that counts.

I thought, when I saw your reply, that it was well put; however, about that time the weather was getting warm, and thoughts of the merry buzz-z-z of flies at meal time, together with the fact that our rear door would be the better for a storm door, set me to thinking of making a combination screen and storm door.

So I hied me away to a nearby yard and ordered stuff accordingly.

Now, I like jokes as well as anybody, but when a man sends an "old bachelor" door of such a shape as to better answer the purpose of "cradle rockers," I don't think his trade should be benefited, especially as it was our first acquaintance.

About this time I was doing some digging in our back yard for a bit of garden. Somehow, when I came to hang that door I thought of some planks I used often to walk over in crossing a muddy spot—the sun from above and the moisture from beneath curved them up. I turned them over, and next day or so they'd be warped back the other way. So that's just what I did with my door—tramped it into the fresh-dug soil in the garden, rounding side up, till it turned the other way; hung it so this side would still get the sun, and with a good painting to keep it from taking in rain, I don't expect any more trouble. Geo. H. Jackson.

To Approximate Area of Steel Angle
To the Editor: St. Louis, Mo.

Please explain to me the correct method of obtaining the areas of steel angle bars, as a 6 by 6 by \( \frac{5}{8} \)-inch, 6 by 6 by \( \frac{3}{8} \)-inch or 6 by \( \frac{3}{4} \)-inch? Herman Bartels.

Answer—The values of areas of steel angles are given in the hand books of the steel companies. You will find tables in these books which will give you areas, weights per foot of length, and other important properties of these sections.

If you wish an approximate method of obtaining the area, the following may be an aid to you: A 6 by 6 by \( \frac{5}{8} \)-inch angle may be divided into two rectangles, one of them 6 inches long and \( \frac{5}{8} \) inch wide, while the other \( \frac{5}{8} \) inches long by \( \frac{3}{8} \) inch wide. The area of the 6 by \( \frac{5}{8} \)-inch rectangle would be 3 square inches, and the area of the \( \frac{5}{8} \) by \( \frac{3}{8} \)-inch rectangle would be 2\( \frac{3}{4} \) square inches. The sum of these two areas, \( 3 \times 2\frac{3}{4} \) square inches, would be the approximate area of this section. This checks out with the area given in the Cambria Steel Company hand book for this same size of angle.

The Boss Carpenter.
Saved $200.00 on this fine barn

"The lumber is some of the best that money can buy," writes August Pasbrig, of Dwight, N. D., "and I am certainly satisfied I saved about $200 by sending to you for it."

Lumber, millwork, hardware, paint for this fine barn, 32 by 61 feet, F. O. B. Seattle, $689.47.

For Practical Barns That Sell
Get H-L-F Barn Builder’s Guide


Money making ideas for fall house jobs in H-L-F Plan Book—ten cents

Fourth big edition—many new plans. Shows pictures, floor plans, specifications, costs of practical houses that YOU can sell to YOUR customers. Specializes on practical houses for farm folks and small town folks who want full value for their money. Worth a thousand dimes, but one dime brings it, postpaid.

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[ ] Millwork Catalog (free)
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Address

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**STOP! LOOK! SOMETHING NEW**

Inside Doors with Jambs and Trim 2 Sides Complete for One Price. Avoids Errors.

**DOOR TRIM No. 132**  
**Five Panel Door**

**IN STOCK—CAN SHIP SAME DAY ORDER IS RECEIVED QUALITY GUARANTEED MONEY BACK IF NOT SATISFACTORY**

One Side Door Trim consists of—Base Blocks, 874, Casing, No. 8309; Cap, Nos. 8394, 95, 96

**PRICE INCLUDES DOOR, Y. P. JAMB No. 36, STOPS and TWO SIDES**

<table>
<thead>
<tr>
<th>SIZE</th>
<th>2-6x6-6-1/2</th>
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<th>4-6x6-6-1/2</th>
<th>5-6x6-6-1/2</th>
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**PRICE OF OAK DOORS INCLUDES OAK JAMBS AND TWO SIDES OAK TRIM.**

**OAK DOORS FLAT PANEL**

**PRICE INCLUDES DOOR, GLAZED—WHITE PINE FRAME HOUSE DOOR FRAME, No. 620 D. C. AND YELLOW PINE INSIDE DOOR TRIM No. 132**
**GREATEST BARGAINS EVER OFFERED**

**Glazed Windows with Frame and Trim Complete**

**WINDOW TRIM No. 113**

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<th>Size</th>
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**PLAINLY WINDOW**

No. 708

**WINDOW FRAME No. 600 D. C.**

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**“RIVERDALE” Wall Board**

Illinois: $1.60
Ohio: $1.60
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West Virginia: $1.60
Michigan: $1.60
Wisconsin: $1.60

**SLATE SURFACED SHINGLES**

<table>
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<tr>
<th>Size (8x12)</th>
<th>Price per Square</th>
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<tbody>
<tr>
<td>Red Slate Surfaced Shingles</td>
<td>$4.00</td>
</tr>
<tr>
<td>Grayish, Green Slate Surfaced Shingles</td>
<td>$4.00</td>
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**FACTS ABOUT FREIGHT CHARGES**

The freight on flooring is nothing compared to the saving we offer you. If you wish to order, make the best offer you can, and we will do our best to accommodate you. Our flooring is the cheapest because it is the best, therefore costs less to lay.

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**WE GUARANTEE TO OUTWEAR WOOD SHINGLES AND WATERPROOF CLEAR THROUGH THE FELT WITH ASPHALT SATURATION**

**WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER**
Methods of Laying Composition Flooring
By C. F. Teller
President Sanitary Composition Floor Corporation, Syracuse, New York

Composition flooring is composed of finely ground mineral substances which are selected particularly because of their properties of not being affected by heat or cold. The flooring when finished is water-proof and also fire-proof.

The flooring is shipped as a dry powder and a liquid, which can be mixed and applied by any one that is familiar with plastic materials such as plaster, cement, mortar, etc.

This material can be laid on any sub-floor—wood, concrete, tile, brick or stone. It forms a smooth, elastic, water-proof surface that will not crack, chip, or wear dusty. The rounded corners and the non-absorbent properties of the material make composition flooring extremely sanitary and easy to keep clean.

It can be applied to any wooden floor, no matter what condition it is in or how it is finished, and will give a smooth, water-tight floor. The following method is the best to follow in doing this kind of work:

1. The base or floor moulding should be first removed and going to build, remodel or repair? Get these TWO valuable books FREE

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for building material. Our big Catalog tells you how. It shows 8,000 PRICE BARGAINS and contains illustrations, prices and descriptions of every conceivable article that enters into the construction of a building. It tells you how to buy lumber, flooring, roofing, doors, windows, moldings, cabinet work, colonnades, porchwork, hardware, tile, paints, wallboard, metal work, plumbing and heating equipment, water supply outfits and thousands of building specialties and interior fittings at WHOLESALE prices. Everything is sold direct to YOU and YOU save all middlemen's profits.

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WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
Words could not portray the lasting qualities of White Pine as graphically as this remarkable photograph. The exact date of the unpainted, weather-beaten siding is not known, but it is certain that the siding on the main portion of the house is from 150 to 200 years old, and stands now as originally built, with practically no repairs. The siding on the lean-to is of a considerably later date, but it will be noted that there is no appreciable difference between it and the siding on the main portion of the house. Both are in splendid condition today and good for service for many years to come.

For the outside covering of a building exposed to the attack of time and weather, no other wood gives such long and satisfactory service as WHITE PINE

Every carpenter knows that from his own experience. But every carpenter does not know that he can get White Pine today, for in some way the impression has gained footing that the supply of White Pine is practically exhausted.

The fact is—White Pine is still abundantly available today, as it always has been, in all grades and in any quantities desired, and can be purchased in all markets at reasonable prices, when considering its value as a structural wood.

If the Lumber Dealers supplying the material for those for whom you are building are at any time unable to furnish it, we would appreciate the opportunity of being helpful in securing it.

A Free Magazine for Contractors

The first issue of the bi-monthly architectural White Pine Magazine has been mailed to contractors. Every issue will be full of valuable and helpful information for contractors and builders.

If this magazine does not reach you, kindly advise and we will be pleased to place your name on our mailing list.

Address, WHITE PINE BUREAU,
1735 Merchants Bank Building, St. Paul, Minn.
Effects like this are possible through the use of North Carolina Pine.

For Interior Ornamentation

The beautiful, figured grain of North Carolina Pine lends itself to charming interior ornamentation,—paneled walls, built-in bookcases, beamed ceilings, floors and doors.

North Carolina Pine is not "Yellow Pine," but softer and firmer in texture, and lends itself readily to the tools of the carpenter. Its comparative freedom from resinous matter makes it an ideal subject for the painter and decorator.

Architects' and Builders' Reference Book FREE

Prepared in convenient size for filing. Describes the many uses of North Carolina Pine and shows the beautiful effects obtainable. Specimen panels on request.

North Carolina Pine Association
Norfolk, Virginia
Satisfaction is just another name for Arkansas Soft Pine

This lumber possesses the traits that appeal to the carpenter, the contractor and the owner. It is easy to work, holds paint, does not split. When employed for interior woodwork it places any wood effect within reach of the user. Carpenters who want the best are sticking to Arkansas Soft Pine.

SEND FOR USE BOOK

Arkansas Soft Pine Bureau - 608 S. Dearborn St., Chicago
A Pergola Constructed of Union Metal Columns

UNION METAL COLUMNS
"THE ONES THAT LAST A LIFETIME"

For Porches, Pergolas, Interiors
They offer the builder an opportunity to use the column more freely than ever before.

First—Because they are proof against splitting, checking, rotting, warping and opening of joints which in many cases mar such work in a few months after its completion.

Second—Because they are so reasonable in cost—but little more expensive than a so-called good wood column.

Union Metal Columns are not substitutes or makeshifts, but are architecturally correct in every detail as to design, strength and appearance.

Thousands of successful installations have been made, including every class of building and every kind of work where columns are used.

Ask for details showing design and construction.

Complete catalog in SWEET'S

THE UNION METAL MFG. CO.
CANTON, OHIO

A letter of considerable general interest to carpenters and builders was received by us a few days ago, and we pass it on here to our readers:

Northumberland, Pa., June 15, 1915.

AMERICAN CARPENTER AND BUILDER, Chicago.

Dear Sirs: We have looked over your proof sheet for July issue and beg to draw your attention to your remark, "Cut nails do not rust."

We, as manufacturers, say, "Yes, they do rust"; but there is this difference—wire nails corrode, the material actually disappears, but you don't see any rust—it simply peels off. Such we gather from science reports.

Shingles become very much soaked at the butts with rain, and sweat from the action of the sun. Being mostly soft wood, when the heat of the sun bears on the roof, the shingles are easily drawn and warped by its rays. Then it draws the shingle holes off the nail in question whose body has begun to disappear; and the head part is no longer there to stay its warping, having already disappeared by the corrosive action.

Now, take the cut nail made expressly for this special work—called shingle nails—flat grip and edge grip. The stem is slightly thicker than the ordinary nail used for mouldings and general inside work. Then the head is much larger; and when the sun exerts its influence in drying the shingles, the large expanded head resists the soft wood from drawing over it, and successfully holds the shingle flat, preserving the original sightly view of the roof.

And this kind of nail we guarantee to maintain its proper uses for thirty, forty, or fifty years, if the shingles themselves are preserved that length of time. We advocate the edge grip as less likely to split the shingles. When the small or thin head is used for the nail, the trouble is not perceived at the time, because the damp shingles are held together by their own adhesive suction; but when a high wind comes and dries them out, then off they go, leaving a leaky roof which on repair becomes an unsightly spotted roof, causing the owner to use much profane language.

Yours truly,

Van Aten & Co.,
Per F. Round, Gen'l Mgr. (E. G. Van Allen.)

We assume that Mr. Round is speaking in this letter for all the group of cut nail manufacturers, whose announcements in our pages have been arousing so much favorable comment of late. A letter to any of the addresses given will bring some very interesting material.

Another Size Added to Crimp Edge Eaves Trough

The Milwaukee Corrugating Company, Milwaukee, Wis., manufacturers of 3 ½, 4, and 5-inch crimp edge eaves trough have perfected machinery whereby they can also furnish same in 6-inch size.

Crimp edge eaves trough is made from galvanized sheets, either slip or lap joint and has the advantage of being rigid, perfectly formed and exceptionally strong. The crimp edge also prevents hangers from slipping.
AN UNUSUAL SITUATION

It is not unusual for people to expect delivery of terra cotta within three weeks or even three days after placing an order—it's extremely unusual to get it as quickly as this—yet, users of Midland stock white enamel find such deliveries the USUAL thing—let us prove it to you on your next building.

MIDLAND TERRA COTTA CO.
1515 LUMBER EXCHANGE BLDG., CHICAGO, ILLINOIS

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
Six-Inch Crimp Edge Eaves Trough.

The manufacturers claim that the 12-foot lengths, made without a cross seam, are just as easy to handle as the shorter pieces and more profitable, as they save twenty per cent of the cost in putting on.

The demand for crimp edge eaves trough is steadily increasing and dealers claim that once used it is always wanted. The Milwaukee Corrugating Company also advises that their new general catalog, which will be the handsomest and most complete sheet metal catalog ever issued, will soon be ready for distribution. Besides illustrating and describing their line of "Milcor" products, it will contain valuable in-

formation on figuring roofing and siding and the method of application of same and other general information which can only be gained by years of practical experience in the sheet metal line.

Laying Asphalt Shingles

A very useful booklet has recently been published by the Asphalt Ready Roofing Company, which contains much information that should be interesting to every builder and carpenter. Several suggestions are given that show the best methods to follow in laying asphalt shingles to secure the best results and to obtain artistic effects.

In laying these shingles, the bottom course at the eaves should be double. The bottom row at this course should be started with a full shingle and the upper row with a one-third width of shingle. The next course should be started with a two-thirds width of shingle and the next with

SAFETY

REYNOLDS SHINGLES

It is not economy to buy cheap goods, neither is it good policy to pay more for an article than the service rendered will justify. Reynolds Shingles have accomplished a great roofing economy by combining high quality with conservative costs of manufacture and sale. If your roof leaks, have your roofer put on Reynolds Shingles. If you are building a new house or barn, insist on having Reynolds Shingles. They give you durability, beauty and fire-retardant value for less cost to you than with any other roofing material.

Write for free booklet and samples of colors.

H. M. Reynolds Asphalt Shingle Company
"ORIGINALATOR OF THE ASPHALT SHINGLE"
Grand Rapids, Michigan

FIRE!

Lightning and Storm proof, plus architectural beauty, are the two leading and winning features about Montross Metal Shingles.

But the prices we quote you, Mr. Reader, is the compensating fact that makes MONTROSS METAL SHINGLES the most popular metal roofing on the market. They answer every requirement of safety, beauty and service. In addition they are economical in price and easily laid.

Every Montross Metal Shingle is an advertisement for you. It means more business.

We are giving one man in every section exclusive rights for his territory, with business enough to make him independent within a short time. We help to create business for every dealer.

Write now for trade terms and our booklet, "The Best Roof Under the Sun", giving information on roofing material never disclosed by a manufacturer to his trade before. We have a department devoted exclusively to estimating and will furnish you with Engineering advise FREE.

Montross Metal Roofing Co.
102 Erie Street,
camden, N. J.
—write us at once. Our national advertising campaign is bringing us hundreds of inquiries.

Whether or not we have a distributor for NEPONSET Shingles in town, we like to refer the inquiries to a builder who will follow up the inquiry and put on the NEPONSET SHINGLES

This means business and profits for you.

We want to arrange with builders to lay NEPONSET Shingles in every town in this country.

As you probably know the NEPONSET Shingle has caused a sensation in the shingle world. It is a double shingle. You lay two at once. It is fire resisting, and forms seven layers of durable, waterproof materials on the roof, which it covers. In short carpenters say it is “some” shingle.

BIRD & SON Established 1795
EAST WALPOLE, MASS.

NEW YORK WASHINGTON CHICAGO SAN FRANCISCO

Canadian Plant and Offices—Hamilton, Ont.
Write Our Nearest Office

BIRD & SON
I have never laid the NEPONSET Shingle and would be pleased to hear from you.

NAME

ADDRESS

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
 Resolve to Win!

Determination made Grant one of the greatest generals in history. The world knows his story. It knows, too, the stories of thousands of other determined men, who succeeded because they had a purpose and stuck to it.

Do you want to succeed? Do you want that better job? Do you want that increase in pay?

If you do want to get out of the rut—if you are determined to make something of yourself, send the International Correspondence Schools the attached coupon. Tell them what kind of position you want and they will show you how you can fit yourself to get it.

More than 500 determined men and women got better positions last month solely as a result of I. C. S. training. They secured this training in their own homes, at small cost and without losing time from their every-day work.

Determine to mark and mail the coupon today

INTERNATIONAL CORRESPONDENCE SCHOOLS
Box 910G SCRANTON, PA.

Please explain, without further obligation on my part, how I can qualify for a larger salary and advancement to the position, trade or profession before which I have marked X.

Architect
Arch'l Draftsman
Contract & Build.
Structural Eng.
Structural Draftsman
Plum. & Heat. Con.
Bpt. of Plumbing
Foreman Steam F.
Heat. & Vent. Eng.

Estimating Clerk
Civil Engineer
Surveying
Mechanical Eng.
Mechanical Drafts
Stationary Engineer
Electrical Engineer
Electric Lighting
Concrete Constr'n

Automobile Running
Motor Boat Running
Foreman Machinist
Blue-Met. Pat. Drafts
Bookkeeper
Advertising Man
Window Trimming
Commercial Illustra'tg
Civil Service Exams.
Chemist

Name:

Street and No.

City: State:

Present Occupation

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
Going to the Bad!

All Because of Poor Nails

The Shingles are not worn out, Oh, no! But the nails are—or nearly are; consequently the shingles loosen, the roof leaks, and the innocent shingle suffers the blame, when it's the fault of the Nail.

CUT NAILS

and Good Shingles result in a Good, Durable Low-Cost Roof

A Roof that will give years of service. Shingles are the roofing you are familiar with and have always used. Use Cut Nails and make your good shingle roofs last longer—much longer—than the majority of roofings on the market today. We have seen shingle roofs over fifty years old, and still good; but good, durable Cut Nails were used.

Build for the Future

It costs no more to use reliable Cut Nails in a building than wire nails, which soon rust and the difference will be noticeable in as short a time as ten years. In the places where nails are exposed to moisture near the ground, on porches, on the roofs, etc., the wire nails will be all, or nearly all, rusted away—the wood will rot around the nail hole, and the board will probably spring and have to be renewed or repaired. Cut Nails will last many, many years longer, and in addition have far more holding power, in some instances over 100% more. So by using Cut Nails you not only lengthen the life of a building, but you save the owner money on repairs and cost of upkeep as well.

Ask You Dealer for Shingle Cut Nails

If he doesn't handle them write to nearest manufacturer, who will see that you are supplied. The manufacturer will also supply you with Free Samples.

Cut Nail Manufacturers

Tremont Nail Co., West Wareham, Mass.
La Belle Iron Works, Steubenville, O.
Wall Board is a great success for Light Store Partitions. The Stock Rooms and Cases in this Exclusive Ready-to-Wear Shop are Made of "Neponset" Wall Board, made by Bird & Son, Dept. C, East Walpole, Mass.

Here are Two "Southington" Hardware Co. Products That are recognized each as the best of its kind.

The New "Hold-Fast" Bevel
Imported Wood Handle—No. 105, Brass Trim.

NEW Locking Device

The Locking Device is a New Idea, controlled by us.

No. 105—Imported Wood Handle.
No. 95—Iron Handle, N. Plated.
Both are made in—6"—8"—10"

SEND US 50c for 8" SAMPLE of EITHER

TO DEALERS—We have an Attractive Proposition to make You—Write.

The "Standard" Take-Down Square

The Locking Device is your Surety that the Tongue CANNOT SLIP.

FINISHES
Polished............each $2.25
Nickel Plate........." 2.50
Blue................." 2.50
Copperplate.........." 2.50
Galvanized..........." 2.50

The Prices Include Delivery to You

These Take-Down Squares have already given many thousands of Mechanics excellent service.

TO DEALERS—We have an Attractive Proposition to make You—Write.

Both these "Southington" Products are GUARANTEED AGAINST mechanical defects and imperfect workmanship.

THE SOUTHINGTON HARDWARE CO.
SOUTTHINGTON, CONN.

Also Makers of—WOOD SCREWS—TRY and MITRE SQUARES—LEVELS—BEVELS and other TOOLS

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
The Pinnacle of Perfection

STEEL LEVELS

Cost no more than wood
Cheaper than Aluminum
Light and Strong
Durable

With these Levels you can easily establish any grade in degrees or inches Rise to the foot—or find any Grade already established.

Think what that means—a level that indicates in inches or degrees the number of inches rise to the foot of the surface or place upon which the stock rests. No figuring—read it right on the graduated ring. Consider how valuable it is on Framing and all kinds of work.

A word about the construction of ACME STEEL LEVELS

Acme Steel Levels are all made of cold rolled steel strips, substantially put together. Frame is nickel-plated and the webs oxidized. Years of hard use has demonstrated the correctness of this construction, Acme Steel Levels remaining perfect, unwarped and in good condition. They are all provided with the best proved vials obtainable and are guaranteed to give accurate readings when in adjustment. Acme Steel Levels come in all sizes for all sorts of work. We call special attention to our No. 6 Casing and Graduated Ring, which can be inserted in long levels or Straight Edges. We also make try-squares equipped with our indicating vial. Acme Steel Levels come in various lengths, but are of a uniform width, being 2½" wide.

Ask your Dealer for ACME LEVELS and Try-Squares. Every dealer should carry these up-to-date improved Levels. If he doesn’t carry them write to us and we’ll supply you direct. If you send us your name and address we’ll send you a booklet showing all our styles and explaining “ACME” construction.

THE ACME LEVEL CO.
2104-A Detroit Ave.
Toledo, Ohio

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
KisselKar Trucks
Always on the Job

KisselKar Trucks are invariably spoken of by drivers and garage men as the best trucks they know.

And it's true that a KisselKar Truck is of better material, better built, better balanced than the average truck. It is a staunch, powerful, dependable, scientifically constructed vehicle—one that is always on the job.

KisselKar Trucks are furnished in six sizes and with bodies to suit any business or special requirement. The loading capacities are 1500 lbs., 1 1/2, 2 1/2, 3 1/2 and 6 tons, respectively.

KisselKar Trucks
In Six Sizes

Intelligent care is exercised by the Kissel Motor Car Company to furnish the exact truck needed by a customer.

Individual conditions, as well as those common to the line of business to be served, are minutely considered and advice given accordingly.

Write fully regarding your haulage problem—the mileage, the loads, the nature of cargo, the condition of roads, the number of stops, your present haulage equipment and all other facts that bear. And don't fail to ask for our illustrated portfolio.

Kissel Motor Car Co.
546 Kissel Avenue
Hartford, Wisconsin

An Electrical Triumph

The housewife has learned to wash, iron, heat, light, cook and clean with electricity. Now, owing to recent electrical developments, she may keep the flies out of her home with wire cloth protected by electricity.

The Reynolds Wire Co., of Dixon, Ill., have perfected and adopted a new patent process for producing their rust-proof "Alumina" cloth. Owning, as they do, the never-failing electric water power of Rock River at Dixon, they are especially well equipped to do this work. It requires over one hundred horse power to drive the electric generators which take the shining zinc from the big bars and deposit it, layer after layer, on the steel wire, after the cloth is woven, thus giving to rust-proof "Alumina" its many coats of pure zinc which afford perfect protection.

With the old method, where the zinc is melted and applied hot, only one protective coat is possible; just like a house painted with one coat, the weather resisting qualities are not there. Rust-proof "Alumina" cloth, with its multiplicity of pure zinc coats, soft in color like aluminum, is a cloth that defies the attacks of the elements and does not require painting or attention. It is highly sanitary, very transparent, and of an exclusive finish.

Circulars containing samples will be sent to architects, contractors and dealers upon request.


The American Saw Mill Machinery Co., of Hackettstown, N. J., large manufacturers of saw mill and woodworking machinery, have been so fortunate as to secure the services of Mr. Anthony S. Hill, well-known as a saw mill machinery expert, and for many years at the head of Wm. E. Hill & Co., of Kalamazoo, Mich.

Mr. Hill brings to his new connection a rich experience backed by an enviable record of success in the heavy saw mill machinery field. His position will be that of manager of the heavy saw mill department.

It is the intention of the American Saw Mill Machinery Company to greatly amplify their line of heavy duty machinery, under the supervision, designs and patents of Mr. Hill. It is also planned to bring out an improved line of the steam specialties in connection with which the "Hill" name has been so intimately associated.

The American Saw Mill Machinery Company will be thus in the unique position of offering absolutely anything that may be required from the lightest portable or stationary mill to the very heaviest that can be produced.

In order to handle their increased lines with maximum efficiency, the company are now building extensive additions to their already large works.

Sound Deadening in School Houses

The acid test of a sound-deadening material is found in its application to school houses. A material that will effectively prevent the transmission of sound from room to room and from floor to floor in a school house will succeed in any of the ordinary sound-deadening problems.

Samuel Cabot, Inc., has recently issued an interesting booklet, entitled "School Houses," that shows some of the many installations of their sound-proofing "Quilt." This material is made of cured eel-grass which is held between layers of tough manila paper by quilting. Where absolutely fireproof construction is wanted their "Asbestos Quilt" is used. This is the regular Quilt covered on both sides with heavy asbestos paper.

Eel-grass will not burn unless a direct flame is applied and will cease burning as soon as the flame is taken away so it is an effective fire retardant. To show its lasting qualities,
The 1916 Haynes is Here with Many New Refinements

Come see the 1916 Haynes—the same wonderful car that was the sensation of last season—the car that still dominates the "light six" field. Many new refinements have been added for your comfort and convenience.

The bodies are big and roomy, with deep rolls of soft upholstery. Real hand-buffed leather is used. Individual, adjustable front seats are used on both the five and seven passenger models. The front doors are retained so that entrance may be had directly to the front compartment.

The two auxiliary seats used in the seven passenger model disappear entirely into the floor when not in use; only two rings are visible.

The three passenger roadster is of the clover-leaf design, containing three individual seats with form-fitting upholstery. The center seat is dropped back and an aisleway is left between the forward seats. An unusual amount of carrying space is provided.

Self-lubricating springs are used in the chassis. Helical bevel drive gears are used in the rear axle. The equipment includes a Waltham clock, Boyce Moto-Meter, trouble lamp, automatic circuit breaker to take the place of fuses, Sparton horn and non-skid tires on the rear. Over-size tires on the seven-passenger model.

TWO MODELS—THREE BODY STYLES.

Model 34—America's greatest "Light Six"—5-passenger Touring Car, 121-in. wheelbase, weight 2,550 lvs......$1,385
Model 34—the prettiest Roadster in America—3-passenger..................................................1,485
Model 35—the Kokomo "Six"—7-passenger Touring Car, 127-inch wheelbase.............................1,495

Weight 3,050 lvs.

All prices f. o. b. Kokomo.

Catalog with complete specifications on request.

The Haynes Automobile Co.
14 South Main Street

Kokomo, Indiana

Model 34—Five Passenger Touring Car—Price $1,385, f. o. b. Kokomo, Ind.
the manufacturers cite a case of a house that was built in 1653 and had the walls stuffed with this grass. The grass is still in perfect state of preservation.

Cabot’s “Quilt” comes in three grades, by weight: Single-ply, one-third inch thick; double-ply, one-half inch thick; and triple-ply, three-quarters inch thick.

Builders will find this book very interesting and can get a copy by writing to Samuel Cabot, Inc., 1133 Broadway, New York, or 24 West Kinzie Street, Chicago.

The Saw in History

Henry Disston & Sons, Inc., Philadelphia, have recently put out a 64-page book, entitled "The Saw in History." It handles in a comprehensive way the development of the saw from its prehistoric origin to its presently highly perfected form. Practically every type of saw is covered, descriptions of the more modern developments being especially complete. The text is supplemented with profuse illustrations.

The preparation of the book involved a vast amount of research work among libraries, private records, original manuscript, etc., and "The Saw in History" is claimed to be the first complete chronological record of the development of this tool.

The facts are presented in an interesting readable manner and its perusal will prove valuable to anyone, especially to those in intimate touch with the present-day application of this universal tool. A copy may be had free of cost by application to Henry Disston & Sons, Inc., Philadelphia, Pa.

The small handy size and the complete index are features of the new general catalog issued by Henry Disston & Sons. All the different types of saws that anyone could imagine are shown, also the many other tools made by this company. There are descriptions of files of all kinds, levels, squares, knives, trowels, etc. Builders will find this catalog mighty useful and can get a copy by writing to the company.

The quality of their productions is well known and needs no recommendation from us.

### MINIMIZE THE COST OF DELIVERY

Install Dart Motor Service

And You Have Solved the Problem

The above cut is of our standard Model “C” chassis which we furnish in either 130 inch or 144 inch wheel base—carrying capacity 3000–4000 lbs.

A truck of sufficient capacity to meet your every requirement.

“Dart” trucks are built upon merit—built to stand the most careful and discriminating inspection.

The service you will receive from motor delivery will depend somewhat upon your ability to select the “Right Truck.”

**DART MOTOR TRUCK CO., Dept. “C-7”, Waterloo, Iowa**

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**Mail the coupon today**

The attached coupon mailed today will bring you valuable information on the “Dart.” Convince yourself of the superiority of the “Dart” truck and we are confident of receiving your order.

"SOLD ON SIX CONTINENTS"

**DART MOTOR TRUCK CO.**

DEPT. “C-7”

WATERLOO, IOWA
$298.00

Buys the Material for
this House
Modern Home
No. 264B107

CARPENTERS
Let us double your profits. For only $298.00 we will furnish all the millwork, flooring, siding, finishing lumber, building paper, eaves trough, roofing, hardware, painting material, lumber and lath to build this four-room house—everything except cement, brick and plaster. Quality and Quantity Guaranteed.

Nowhere else can you secure such a big bargain. Send $1.00 today for the plans, (blueprints), specifications and bill of material for this Modern Home No. 264B107, and mention the American Carpenter and Builder.

Fill in and cut out the coupon below, which will bring you Free our book of Modern Homes, showing over 100 other designs of houses, our latest Building Materials and Millwork Catalog and our Wholesale Lumber Price List. You cannot afford to be without these three great free books. Thousands of carpenters use them in their business every day.

SEARS, ROEBUCK & CO., CHICAGO, ILL.
Four New Hardware Specialties

There is always a keen interest in anything new, especially if this true where the new article fills a long-felt want. For this reason THE AMERICAN CARPENTER AND BUILDER always takes pleasure in bringing before its readers any new improvement that we consider worthy of mention.

Of the many new articles in builders' hardware we have brought before the eyes of our readers, we know of none that deserve more commendation than the new line just brought out by The Thoben Manufacturing Company, 115 E. So. Water Street, Chicago, Illinois.

The Smith Patent Checking Hinge for Double Acting Doors, is made on entirely new lines, to fill the demand for an oil checking hinge for inside doors at a moderate price within the reach of all. This hinge is especially adapted to door from kitchen to dining-room or pantry in homes, apartment buildings or flats. The hinge works in the radius of the thickness of the door, therefore leaving no opening behind the door to crush a baby's finger; and closers so lightly as to eliminate any accident.

There is no slamming whatever, as the door always stops on center. The accompanying illustration gives a good idea of its construction. The hinge is placed at the top of the door and is very simply applied requiring very little labor to apply. The bottom pivot, which carries the weight of the door, is a simple hardened ball and socket joint.

The apartment house equipped with a checking hinge will rent quicker, as this is a strong additional feature.

The Smith Non-Checking Hinge for Double Acting Doors is made especially for those who want a first class hinge that swings in the radius of the thickness of the door and will not pay the price of a checking hinge, but still want something good. This hinge is applied at the top of the door and it partially filled with lubricating oil—enough to last the life of the hinge. The weight of the door is carried by a simple hardened ball and socket joint. The cost of applying is very light, as it takes little labor, therefore is quickly done.

The Smith Sliding Door Lock is a simple, strong, and very effective lock, easy to apply, easy to operate, and very neat in appearance. A compression spring acts on each latch, works from either side and locks both latches. It locks only when key is used. Made in forty-two changes and can be made master-keyed in sets of seven.

The Smith Sliding Door Hinge and Track is something so new and simple that it is sure to impress you. The illus-
Berger's Expanded Metal Lath
Made from Steel or Toncon Metal (Anti-Corrosive). Furnished in all gauges, painted or galvanized.

Berger's Pressed Steel Core
For coring out Concrete Floors and Roofs. Adapted to all classes of construction.

Berger's Rib-Truss Reinforcing and Furring Plates
For Concrete Floors, Roofs, Sidewalls, Plastered Ceilings, Partitions, Stucco Houses, etc. No centering or false work required on ordinary spans.

Berger's Corner Beads.
In all Styles to meet all Specifications. For Perfect Protection to Exposed Plaster Corners.

WRITE FOR SPECIAL BOOKLET F. A. B.

THE BERGER MFG. CO., CANTON, OHIO

BOSTWICK TRUSS-LOOP METAL LATH

Weight, 5 lbs. per square yard
Gives double the weight and strength of re-enforcement. Has the largest, heaviest and strongest plaster key. Shows the lowest cost of finished plaster surface.

TRY IT ON ONE JOB. YOU WILL CONVINCE YOURSELF

THE BOSTWICK STEEL LATH CO.

Spanish Tile

Write for Prices on

Catalogue "S" showing a complete line of Ornamental Roofings mailed free to Architects, Contractors and Carpenters...

Address The Moeschl-Edwards Corrugating Co.

Covington, Kentucky

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
Is the Public Demand for Quality Building Materials Increasing?

"I remember well—I guess most of us do—when the roof used to be considered only an incidental part of the building job," said a prominent building contractor recently. "Those were the days before the roofing manufacturers started to educate the public up to what the requisites of a good job of roofing are. It's been a splendid boost to the entire building game, too. The contractor's reputation has been strengthened because the public has come to demand a better quality of roofing—even if they have to pay a little more for that better quality. And naturally the better the quality of the roofing used, the more satisfactory the job to everyone concerned."

Has this contractor struck the keynote of the real reason behind the recent big demand for better roofings: that the public has learned to appreciate roofing quality and to realize that to secure that quality they must pay for it, just as they appreciate quality in wearing apparel and realize that it costs a little more? From even a superficial investigation it would seem so.

A recent report from the Heppes Company of Chicago adds weight to this theory. "We find," said an official of the Heppes Company, "that the sales of our very best grades of asphalt shingles and asphalt roll roofings are booming constantly. These are by no means cheap roofings; they cost a little more than even a good ordinary roofing. There must be some reason for this unusual demand other than the inherent quality of the roofing itself. We feel that this reason is the tendency of the modern public mind to be exacting as to quality in all building materials. We find this same fact true in regard to our other products—particularly wall board. We have discovered that the public wants only one grade of wall board and that the best grade."

Coming from a firm with such wide experience in the production and sale of quality building products, this statement from the Heppes Company is worth considering carefully. If the public wants quality, why not boost quality, Mr. Contractor? It means more than better profit to you; it means satisfied customers, the only kind of customers that are worth having.

The Heppes Company are offering some very attractive sample displays of their high-grade Flex-A-Tile "Giant" Asphalt Shingles as well as of their new Utility Board in grained wood finishes. Any contractor, carpenter or builder who has these quality products on display is certain to stimulate even a greater interest in quality products among the present and prospective building owners in his locality. The Heppes Company, located at Fillmore Street and Kilbourne Avenue, Chicago, will gladly send these samples on request.

New Hy-Rib Handbook

The 13th edition of the "Hy-Rib" handbook has just been issued. This book contains all the material of past editions and also all new developments.

The various types of "Hy-Rib" are shown with their application to many forms of construction. Specifications and reading matter have been revised so as to include all recent developments. One of the most interesting as well as instructive features of this book is the series of pictures taken in the field, showing different stages of construction of various types of buildings. This book also shows pressed steel construction using pressed steel studs.

Builders and contractors will find this handbook mighty useful for reference purposes. You can obtain a copy by writing to the Trussed Concrete Steel Company, Dept. H. 44, Youngstown, Ohio.
“You’ll Want BAYONNE on Your Porches”

It is laid directly on the dry boards without “setting” in wet paint.

Our waterproof preparation is applied under pressure and permeates the whole fabric. It retains its pliability and at the same time is impervious to water.

For outside work it is superior to metal or other prepared materials—and for inside flooring it takes the place of linoleum or oilcloth.

No material known at present equals it for wearing qualities, combined with noiselessness to tread of feet or drip of rain and freedom from expansion or contraction due to climatic changes.

Write today for Sample Book “N” and get full particulars.

See Sweet’s, Page 539

JOHN BOYLE & COMPANY, Inc.
112-114 Duane St. 78-72 Reade St.
New York City
Branch House: 202-204 Market St., St. Louis

BAYONNE ROOF AND DECK CLOTH

INTERNATIONAL ASPHALT SHINGLES

HAVE MADE GOOD! — WHY?

Because they successfully meet all conditions to which they are subjected.
Because they add a distinctive charm and elegance to the building on which they are used.
Because they provide a guaranteed roof at a surprisingly low price.

Our method of doing business will be interesting to you. Write us today for our proposition and full-sized sample.

MANUFACTURED BY
INTERNATIONAL ROOFING MANUFACTURING COMPANY
MAIN OFFICE AND FACTORY :: :: :: :: :: :: 5305-21 SOUTH WESTERN AVENUE, CHICAGO

Thousands of Home Owners are Receiving this Catalog!

It contains over one hundred views of homes and residences throughout the country for which leading architects and contractors have used

“CREO-DIPT” Stained Shingles

17 Grades
16, 18, 24-inch
30 Different Colors

Our advertising to home owners appears in twenty-one magazines. There are many, many readers of these magazines in your locality. Are you prepared to give them information about particular colors and grades that they want to buy?

Send today for this catalog and our prices

“CREO-DIPT” Stained shingles are selected cedar, preserved in creosote and stained any color desired. They come in bundles ready to lay without waste. Saves the muss, bother and waste of staining on the job. Insures roof and side-wall covering of exceptional life and appearance. Write today.

Standard Stained Shingle Co., 1028 Oliver St., North Tonawanda, N. Y.
Branch Factory in Chicago for Western Trade

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
"After all, I suppose the roofing business is just like any merchant's business—there is quick selling and slow moving merchandise in every line. When I tell you that Flex-a-Tile Shingles are quick 'sellers,' I know what I'm talking about.

"I have sold more roofing jobs by displaying Flex-a-Tile samples in actual colors in the last thirty days than I ever did before in six months. Since I have had the Heppes Reference Book I have been SELLING roofing jobs rather than waiting for customers to come to ME and I have found it pays to push this line."

Send Today for Liberal Free Sample of Flex-A-Tile "Giant"

You can make just as profitable use of our handsomely illustrated reference book—a book of genuine interest to every contractor, builder and carpenter. It explains all about our various brands of roofing and shows HEPPES FLEX-A-TILE AND "GIANT" shingles in actual colors—just as they look on the roofs. And remember, Flex-a-Tiles make handsome roofs and handsome profits.

Drop a postal or write today and we will send the Flex-A-Tile book and samples for your files.

THE HEPPES COMPANY
1010 SOUTH KILBOURN AVENUE :: CHICAGO

Very Complete Line of Builders' Hardware

A very complete line of builders' hardware of all kinds is shown in the 264-page catalog (No. 11) of the Gregg Hardware Co., 44-46 Cadillac Square, Detroit, Mich. Much standard equipment of high grade is shown. The volume is well illustrated. A feature of special value is a full and well arranged index, so that all materials listed can be readily found.

Builders will find it useful for reference purposes. A copy can be had for the asking.

Easy Adjustments Feature of this Floor Scraper

A floor scraper that is particularly easy of adjustment is the "Stern," produced at Lancaster, Pa., by the Stern Manufacturing Co. The blades can be adjusted to a thousandth of an inch, in the following way: A screwdriver is simply inserted in a slot in the center of the quadrant and a turn of the wrist adjusts the blades. A small wheel at the top of the handle can be turned which loosens a brake on the quadrant and allows the handle to be raised or lowered to any height desired. The blades can be removed by turning the small hand wheel at the blade holder.

All these adjustments are simple and mighty convenient.

Another advantage of this scraper is in the fact that it does not require special blades but can use any, say up to a size 3½ inches by 7 inches.

The Stern Manufacturing Company, makers of this scraper, has recently changed hands and is now in a position to fill the demand for same, which was impossible heretofore under the old organization. They have also improved the machine considerably in the quality of the metals used, but of course, could not improve the mechanical end of the machine. Every purchaser of a Stern scraper can feel assured that he has bought the most practical floor machine that is manufactured today, as every user of the Stern scraper up to date will substantiate this statement.

Bicycle Racing Again the Rage

The promoters of the six-day bicycle race in Chicago last winter sensed the fact that the time was ripe for a revival of bicycle racing. The large crowds that turned out to see the race proved that their "hunch" was indeed a happy one.

All over the country the racing fever is spreading. In a score of cities new race tracks have been established. One of the best known of these tracks or velodromes, as they are called, is at Riverview Park, Chicago.

Every week, cycling events are held at Riverview, and every week large numbers of new performers are entering the races in competition for the valuable prizes that are offered.

An interesting effect that the revival of racing is having on the bicycle industry as a whole is reported by the Mead Cycle Co. of Chicago. They say they are doing the largest business in their history and that the demand for machines of the racing type is taxing their capacity.

A very practical development in the trade generally, resulting from the revival of the racing fever, is a tendency to swing away from the heavy machine, loaded with superfluous equipment, back to the old style, light-weight, stripped machine.

The new catalog of the Mead Cycle Co. is a feast for the
There is no question but that the wall-board principle of construction is correct. Then, why not select Fiberlic, which is an improvement over wall boards, and thus have principle and material of the best.

Fiberlic is a remarkably strong, tough, rigid root-fiber product. Being a very dense, compact material of similar parts, Fiberlic has more body to it, is stronger, more fire-resisting, and a better insulator than wall boards, which invariably have several different materials in their make-up.

Fiberlic will give your customers better walls and ceilings—better service. It will increase your profits, for your satisfied customers will bring you new and more business.

Write for Samples and Prices Today

THE FIBERLIC COMPANY, Camden, N. J.

New York Branch: Fuller Bros. Co., 139 Greenwich Street

An Improvement Over Wall Board

Will Bring You Bigger Profits

Fiberlic

It Takes the Best to Stand This Test

H. P. Kehr, Architect, Buffalo, N. Y.

Plastergon was applied all through this brick block a year and a half ago and today is in better shape than when applied.

The Owner and the Architect are Both Pleased with Plastergon

Ordinary wall boards in brick buildings usually cause trouble and most manufacturers discourage their use, but if the board is TREATED—Wood Fibre—it will stand up under any conditions of building. That's why Plastergon is used so much in Atlantic City and other damp places.

You might better use the best—the cost of applying is the same, and the up-keep is less. Costs no more than Ordinary Boards.

Plastergon is the homeowner's choice nine times out of ten. By using it, you increase your chances of business just that much.

Our samples and literature are free—your kit isn't complete without them. A postal brings it.

PLASTERGON WALL BOARD COMPANY, Tonawanda, N. Y., 101 Fillmore Ave.
person who is interested in the purchase of a new machine, or in the providing of equipment for the old machine. Any reader can secure a copy by addressing Dept. H122, Mead Cycle Co., Chicago.

**Striking Twelve**

The owner of a St. Paul newspaper was greatly pleased with an editorial written by the editor of this paper and was complimenting him on his work. The owner told him if he would only write editorials of a similar nature every day, the paper would become the greatest paper in the Northwest. The editor took his praise very modestly and answered that if he kept on writing long enough, he couldn’t help but strike twelve once in a while.

Just now when the hue and cry of hard times is raised with great frequency and the clamor for business is keenest, it is an unusual pleasure to strike twelve.

One day last week Chain Belt Company’s salesman and agents sent in twelve orders for Rex, Low Charging Mixers—these orders coming from all parts of the country proving that there is business to be obtained, although the efforts to secure orders must be increased and “hard times” is very apt to be the cry of the lazy man who is not up and hustling.

Below is a list of twelve orders received in one day for Rex Low Charging Mixers:

- A. J. Bradner, Patton, Ohio
- C. H. Schenk, Springfield, Ill.
- Lodi Concrete Co., Lodi, Wis.
- C. W. Judy, Elgin, Ill.
- A. N. Smestead, Orfordville, Wis.
- The Miracle Concrete Co., Kalispell, Mont.
- City of Barre, Barre, Vt.
- E. C. Humphrey, Ridgewood, N. J.

One Day’s Sale of “Rex” Mixers Lined Up for Final Inspection Before Shipping.

For walls and ceilings of wooden buildings

here’s the right material

Trouble is sure to come sooner or later when you plaster the walls and ceilings of a wooden building. Wood is affected by changes in weather. Plaster cannot adapt itself to the changes. It cracks and eventually falls. Here’s the material that DOES adapt itself to the variations of wood construction—

**CORNELL-WOOD-BOARD**

has revolutionized the wall board business. Made entirely of tough, wiry wood fibres and sealed through and through against the inroads of moisture by the original Cornell fibre-sizing process.

Get posted on Cornell-Wood-Board. It is the quality wall board that the building trade has been waiting for. It saves the muss and delay of plastering. It is better for you and better for the owner.

Cornell-Wood-Board is manufactured, not assembled—the only wall board made complete in one plant from raw material to finished board.

Write for samples and complete information

Cornell-Wood-Board, Dept. A-1, Cornell, Wis.
The Cottage Everlasting

is the one that has walls constructed with good cement. Stucco and solid concrete are economical to maintain and make a substantial, comfortable, handsome house. The concrete house shown above was erected by the Chatham Real Estate and Improvement Co., of Savannah, Ga., and built with ALPHA Portland Cement.

ALPHA PORTLAND CEMENT

The High-Water Mark of Quality

ALPHA satisfies the discriminating builder because it is tested hourly for quality by chemists in all the six great ALPHA plants. In composition, exact burning, and fine grinding ALPHA is an exceptional cement. It represents 24 years of high quality policy and is warranted to more than meet all standard requirements.

Let us send you, free of charge, literature dealing with the use of ALPHA Portland Cement, with stucco work, concrete houses and concrete improvements generally. Ask for ALPHA Book No. 10.

ALPHA PORTLAND CEMENT CO.

General Offices, EASTON, PA

New York, Chicago, Philadelphia, Pittsburgh, Boston, Buffalo, Baltimore, Savannah

Kept Young with White Lead

Here, in 1775, Patrick Henry expressed the undying sentiment of America in his words, "Give me liberty or give me death."

These words have consecrated the little church, and it is fitting that it be kept young despite its hundred and seventy-four years.

Dutch Boy White Lead

and pure linseed oil are the materials that preserve it. You can make the house you plan last at time by specifying that they be painted with Dutch Boy White Lead and Dutch Boy Linseed Oil. It is the economical, long-wearing paint.

Write for folders "B" which tell why. They include specifications and color charts.

National Lead Company


Ankyra Bolt ready for inserting.

The Screw-Hold With 1000 Uses

For holding screws with a bull dog grip in hollow tile, lath-and-plaster, expanded metal laths, metal window-frames, sashes, concrete, etc.

Indispensable in modern building construction to architects, builders, plumbers, steam-fitters, and electricians.

Ankyra Bolts are not loosened by jarring. The nut is an integral part of the Bolt. The screws can’t work loose, but they can be taken out and replaced at will, without losing the Bolt.

Ankyra is a permanent screw-hold.

Ankyra Bolts are the only practical means, in many cases, of fastening fixtures quickly and securely to walls—and the most economical.

Ankyra Expansion Bolts are of special steel, and made for No. 6, 8, 10, 12, 14, 16 and 18 Wood Screws. It will pay you to look into them at once.

Fill out the Coupon for Samples and Booklet FREE

Ankyra Mfg. Co.

Philadelphia
Death of Jacob M. Wiest

It is with sincerest regret that we note the sad death of Mr. Jacob M. Wiest, of the Detroit office of the J. Walter Thompson Advertising Agency. Mr. Wiest died on June 1, as the result of injuries received in an automobile accident near Saginaw, Mich. His loss will be deeply felt by the advertising world.

Bommer Spring Hinge Exhibit

Bommer Brothers, of Brooklyn, N.Y., have a most attractive display at the San Francisco Fair. It is very complete and embraces the well known Bommer single and double action spring butt hinges, Bommer floor spring hinges of all types, such as horizontal, vertical and mortise floor spring hinges, having holdback, release and double release features as well as the plain floor mortise spring hinge, Bommer lavatory spring hinges, strikes and bolts, Bommer screen door hinges, door springs, door holders, and garage and engine house spring hinges, bolts and latches.

A striking innovation in their line of single and double action spring butt hinges is the new "dome tip" pattern which Bommer Brothers have recently put on the market. These hinges, while embodying all the mechanical principles of the new Bommer spring butt hinges of the ball tip style, have a somewhat plain but singularly pleasing design and give a massive appearance.

You Can Make More Money

Globe Fencing is Profitable for you and will appeal to your customers.

Easy to erect. Can be mounted on any style of post and uneven ground. We have many combinations of materials suitable for front, rear or division fencing.—all of A1 materials.

Globe Fencing makes attractive appearing yards. Lets in the sun and permits a freer circulation of air.

Promotes sanitary conditions. Encourages the growth of flowers and vegetation.

Every Globe Fence you erect will lead to other orders from neighboring owners. It recommends itself on sight.

Let us send you catalog and special discounts to carpenters and contractors.

Globe Fence Company, (Un-Inc.)

20-22nd St., North Chicago, Ill.
$275
F. O. B.
Milwaukee

FOllow the Arrows — Here You Have the Facts About the

Rex Mixer

A mixer that is guaranteed to turn out 5 cubic feet of thoroughly mixed concrete in 45 seconds. Just the mixer you have been looking for to put to work on your sidewalks, sidewalks, masonry construction and small concrete work. A mixer with plenty of power, made of the very best quality—Chain Belt Mixer quality—known the world over for service and reliability.

There is a Rex Mixer ready for shipment on receipt of your order. You can afford this mixer and you cannot afford to be without it. Write to nearest agent for complete information and Bulletin No. 61-D.

A Few of Our 49 Agents

W. B. Louer Co., M. Mitsubrise Co., J. P. Sprague Co.,
939 Old Colony Bldg., 40965 Michigan, Hillsdale Building,
Chicago, III. Kansas City, Mo.

Chain Belt Company 730 Park Street MILWAUKEE, WISCONSIN

The Way to Greater Barn Building Profits

It will pay you to know James methods of Dairy Barn construction. There’s more money for you in building modern, properly equipped barns on scientific principles than in putting up the old type. If you build one James barn in a neighborhood it will result in more barn jobs for you, because the dairyman who sees a James barn wants one like it.

Our free service tells about proved principles that enable the builder to establish a reputation as the foremost barn builder in his community.

James Blue-Print and Barn Building Service

includes personal co-operation from Mr. James, the leading authority on barns—a special offer of complete working blueprints of several practical dairy barns of different sizes and types—also Mr. James’ new book, “Building the Dairy Barn.”

THIS VALUABLE BOOK FREE

Write for it today, giving names and addresses of people in your vicinity who expect to build barns, when, and for how many cows.

James Manufacturing Co.
C. T. 75 Cass St. Ft. Atkinson, Wis.

You’re Missing a Bet

Mr. Carpenter

If You Are Passing Up the Metal Shelter Game

IT’S THE BEST BET YET

The METAL SHELTER Agency gets you more business, more customers, more work for your men, more money for you, better and quicker results, and—get this—a REAL BUSINESS OF YOUR OWN

Don’t wait. Get the agency for Metal Shelter Garages, Cottages, Bungalows, Stores, etc., before the other fellow beats you to it. You can sell ‘em, and it’s a cinch to get ‘em up—a building a day. THINK! Investigation costs you nothing. Write right now.

Metal Shelter Co., Inc.
Whitehall Bldg. New York City

When Writing Advertisers Please Mention The American Carpenter and Builder
"Your new grained Utility Wall Board effects are not only beautiful, but now I can figure the entire job—applying, painting or wall papering and everything—at one shot."

That is what a builder wrote us recently, and he is only one of many who have expressed enthusiasm about our new grained wood effects. Utility Wall Board was always a business-getter—a big help—because it did away with the loss of time and waiting for plaster to dry.

But these wonderful new effects in mahogany, circassian walnut and oak—grained with all the beauty of the natural woods themselves—make it possible to panel and decorate at one and the same time.

When you put on these new Utility grained effects you not only save time and make a handsome profit, but you also insure satisfaction to your customers. Write us now for samples—sent to you without cost.

**The “Superior” Woodworker**

This woodworker is the latest model of a successful builder of woodworking machinery and has many good features. The frame is made entirely of iron which gives it plenty of strength to stand the wear and tear that a woodworking machine has to go through. Plenty of power is furnished, so that all the attachments can be easily handled. Some of the attachments can be seen in the accompanying illustration.

Rip saws, cross cut saws, jointer, moulding knives, dado head, disc sander, auger bits, and emery wheel are some of the attachments for this machine.

**Beautiful Interiors**

The **Roberds’ Ideal Wall Board**

"The Guaranteed Moisture Proof Wall Board" is the perfected combination of the results of 21 years of study and experimentation. It is made of the best, the hardest, the stiffest fibre board that can be produced with a surface that is perfectly adapted to all kinds of decoration without sitting or other preliminary treatment. It consists of four sheets of macerated wood fibre cemented together with three layers of specially prepared asphalt cement, making seven distinct layers. It is absolutely waterproof, is fire retarding, will not check nor crack, will not mar nor crumble, and can be kalsomined, stenciled, painted or papered. Finished in gray, tan, mission and quartersawn oak. Write today for free package of samples.

**The Heppes Company**

4503 Fillmore Street

Chicago
28 Years of Continuous Service
has demonstrated the lasting qualities of
CORTRIGHT Painted Red or Green Metal Shingles

These painted metal shingle roofs put on 28 years ago are as good as new today.
Showing that there is no need to pay the record high price for galvanized shingles due to the high price of spelter.
The present great demand for metal shingles throughout the country was created by this record made by
CORTRIGHT Painted Metal Shingles

They're better than ever today, and in greater demand than ever, so this is the shingle for you Builders to push now.
There is good profit for you in doing so.
Write for full particulars.

Cortright Metal Roofing Company
Philadelphia and Chicago

The Walter's and Cooper's Zinc Coated Metal Shingle
is coated or plated after stamping, so that every last possible spot where deterioration could start has a rich, heavy, zinc coating. The result is: Walter's and Cooper's Interlocking Metal Shingles are practically indestructible under all climatic and weather conditions. Roofs covered thirty years ago are as good now as when first put on and have never caused a cent's worth of expense in renewals or repairs in all that time. Roofing contractors make a very handsome profit handling these shingles. Ask for particulars.
National Sheet Metal Roofing Co.
339-345 Grand St., Jersey City, N. J.

ARoof to Be Proud Of
A Rex-tile roof means satisfaction—for the carpenter and builder because it is easy to lay and will never cause complaints—for the house-owner because of its distinctive appearance and durability.
Rex-tile Shingles are handsomer than wooden shingles, slate or tile, economical and will wear indefinitely.
Absolutely water and wind-proof—fastened at the butt-end, and folded back over the nails—can't curl, warp, nor leak.

Rex-tile
"The Scientific Shingle"
are fire-resisting and color-fast—no painting or staining necessary—the color is a part of the material. Easy and convenient to handle; a smooth, clean surface and light in weight.
No price-cutting competition if you use Rex-tile on your roofing jobs. An exclusive material, because the turn-under fold for nailing—at bottom—no flapping or warping—nails perfectly covered—is patented, therefore sold for only one price.
These shingles are being extensively advertised. Will you write for sample shingle, prices and full information?

Flintkote Manufacturing Co.
90 Pearl Street, Boston, Mass.
67 Beaver St., New York
659 Peoples' Gas Bldg., Chicago, Ill.

Also manufacturers of Paradux—a waterproof canvas covering for all surfaces on which walking will be done—such as sleeping porches, piazza roofs, roof gardens, balcony roofs, boat decks, etc. Easier to lay than tin or metal—far more durable—requires no special preparation of the surface to be covered. Can be painted any color desired.
The sawdust trough for removing the sawdust away from the machine is one of the features of this woodworker.

The price of this machine is very moderate and contractors and builders can secure full particulars from the Superior Woodworker & Machine Co., 58 Carlton St., Buffalo, N. Y.

Modern Methods in House Moving

An attractive catalog has recently been issued by the LaPlant-Choate Company, describing modern house moving and the application of their equipment to this work. They show many instances where the speed of moving is largely increased and the building protected from twisting and racking by the use of “Giant Steel Trucks.” The catalog is fully illustrated with field pictures and cuts of their various types of house-moving apparatus. Builders can get full information concerning this money-making equipment by addressing the LaPlant-Choate Manufacturing Co., 620 Eastlock Court, Cedar Rapids, Iowa.

Value of the Tile Business to Concrete Contractors

Millions of dollars are paid annually by the American farmer for drain tile, and of this amount the clay interests receive by far the greatest share. The failure of the concrete products manufacturers to make a stronger bid for the business can be attributed only to the fact that, as a business, the manufacture of cement tile is comparatively new and consequently little known to the trade at present. Properly made cement tile have ends of a true circle, free from all possibility of becoming warped or forced out of shape, and retain their perfect condition indefinitely. On the question of durability, too, there can be no two opinions; the great strength of cement tile having been demonstrated time and time again.

It is usual to be skeptical of any statement claiming a combination of higher quality with lower price, but in regard to cement tile the statement is true beyond question. Natural conditions make this possible. The manufacture of cement tile is a small business and a local business. By “small” we mean it can be started on a small investment. By applying the facts outlined in the preceding paragraph it can be realized how the cement tile manufacturer can make cement tile cheaper than local dealers can buy clay tile, and while it is not necessary to cut prices in order to sell cement tile, it is an excellent weapon for times of emergency.

While the tile business is open to anybody, those already established in the manufacture of concrete products can enter the tile business on a comparatively low investment for equipment. It will, of course, be necessary to buy a tile machine and necessary casings for making the different sized tile, but such accessories as a concrete mixer, gasoline engine, etc., are part of almost every contractor’s present equipment.

It is interesting to quote instances of actual successes with cement tile, and while space does not permit mention of many, we are glad to point out two typical cases from among our readers. In the first illustration (page 130) we show the tile plant of Mr. P. A. Quanstrong of Genoa, Ill., whose experience is representative of what hundreds of other men are doing.

During the recent Chicago Cement Show Mr. Quanstrong was asked what reasons induced him to get into the tile business, and what results he had achieved; his reply follows: “It was at the Cement Show of 1913 that the idea of entering into the manufacture of cement tile took definite form. Previous to that time I had, in connection with my other contracting interests, been putting up cement silos. Of course, the season for this work was not long. With the idea in

![Image of Berlin Saw Rig]

**Portable Woodworking Mills**

The Berlin heavy duty portable Saw Rig is a combination of rip saw, cross cut saw, dado saw, grooving machine, jointer, jig saw, boring machine, sander and emery wheel with its own power plant so conveniently arranged that it can be moved from job to job in a light spring wagon at no more expense than a carpenter’s tool box. It actually does the work of twenty men with one operator and 20 to 50 cents worth of gasoline.

**Designed and Built for Durability plus Portability**

The Berlin Saw Rig is easily moved from job to job—but strong and rugged enough to withstand the hardest service building contractors may put it to. Frame and main bearings are cast semi-steel, made in one piece without joints. Frame is then supported by two-inch extra heavy pipe legs on wood skids, which makes a very strong, rigid construction. “Berlin” Gasoline engines are four cycle, horizontal water cooled engines and have built-in magnetos, eliminating battery and ignition troubles. These engines are easily started in cold weather and are accessible by simply raising the wooden table. Machines are equipped with highest grade saws, knives and accessories.

**Guaranteed for Two Years**

All Berlin Saw Rigs are guaranteed against defective workmanship or material for a period of two years. During this time any broken or defective part will be replaced free of charge. Write for detailed specifications and information. The BERLIN Saw Rig is unsurpassed for combined durability and portability.

**SCHAEFFER MFG. CO.**

**BERLIN, WIS.**
Federal Parquetry costs very little more than Strip Flooring

CASS GILBERT
Architect of the Woolworth Building

ERNEST FLAGG
Architect of the Singer Building

CARRERE & HASTINGS
Architects of the N. Y. Public Library

SPECIFY

Parquetry Floors for
high class apartments and residences

They know from practical first-hand experience the very facts that are explained in our Special Circular No. 17. Write for it!

Flatiron Bldg., New York City

When You Want
Tiles and Mosaics

Write

Artistic Designs and Superior Quality

For
Bathrooms, Kitchens, Hallways, etc.

We carry a most complete line of Ceramic Mosaic Floor Tiles and Sanitary Glazed Wall Tiles for every purpose. Our designs are unusually artistic and correctly executed. The quality is Lorenzen—the best guarantee a builder can get. You can depend upon our prices being right.

Let us estimate on your next job or furnish you with an original design. At any rate, write for our Catalog No. 51 on Tiles and Mosaics. A postal will bring it and it is invaluable for your files.

Our large catalog "Vogue in Fire Places" is now ready, the most comprehensive and complete catalog ever issued on Fire Places in Tile, Brick and Wood. Write for it.

Send for our Discount Proposition to Carpenters and Builders

Chas. F. Lorenzen & Co.
103 Washington St. CHICAGO

Santalite Sanitary Composition Flooring

Easily laid just like plaster without cracks or seams on any wood or concrete floor. Sets in 10 hours into a perfectly smooth sanitary surface, fire-proof, germ-proof, water-proof and wear-proof.

No scrubbing required—dustless—will not crack under ordinary circumstances—handsome in appearance and best of all economical.

"SANTILITE" is used in the kitchen, laundry and bathroom for the home—for factory, school, hospital and public building.

ANY MECHANIC CAN LAY IT BY FOLLOWING OUR PATENTED PROCEDURE AND COMPLETE ILLUSTRATED INSTRUCTIONS.

Get in on this—write for our proposition and special prices to contractors—it will mean money in your pocket—or, better still, send us 50 cents for our trial contractors' outfit—it will give you a practical demonstration of the profit to you in handling "SANTILITE."

Santalite Sanitary Composition Floor Company
125 Plum Street
Syracuse, N. Y.

Nail This Fact Down Tight

There is, and there can be only one genuine

Compo-Board

Trademark Reg. No. 94745.

because it is made with a center core of kiln-dried wood slats, and that is our patented feature.

It makes Compo-Board the most desirable material of its kind from these standpoints:—stiffness, durability, non-warping and non-shrinking strength, resistance to air moisture, cold, heat and fire, ease of handling, saving clean and smooth, wide range of uses and adaptability to different methods of decoration. (It's the only wall board that can be successfully papered.)

Be sure you get genuine Compo-Board and nothing else; look for the wood core. The border illustration of this ad gives you a fair idea of what it looks like.

We are forced to issue this warning because "Compo-Board" has become so well known that some folks have the impression it is a generic name for "Wall Board." It isn't. It's the trade-marked name of our own individual patented product.

Sold by dealers everywhere in strips four feet wide and in lengths of one to 18 feet, as desired.

Write for interesting book and sample piece.
Northwestern Compo-Board Company
5777 Lyndale Ave. No.
MINNEAPOLIS, MINN.
part of keeping my men busy the year around and because my
investigation showed a good demand for drain tile in my
locality, I installed a Dunn No. 1 tile machine that spring.
Directing my efforts to the production of only first-class tile
I soon worked up a very good business and sold to the fall
trade in 1913 over 100,000 tile. Anticipating a good demand
for the following spring I aimed to have at least that number
in stock for the early spring trade (1914). However, my
plant operated continuously through last year with the Dunn
No. 1 machine, and late in the fall I had practically no stock.

"In preparation for this year's business I have installed a
Dunn automatic tile machine, and while I am operating the
tile plant with only two men, the production is at the rate of
2,400 tile per day. I will shortly increase the number of oper-
ators and, of course, will get the corresponding increase in
output. When I started into the tile business I had some
clay tile competition; it was here that the quality of my tile
was shown, and I have sold them at even higher prices than
local dealers get for clay tile."

The other illustration shows the plant of Joy & Son, Napa-
nee, Ont., who remarked:

"We started the first Dunn tile machine in our plant in
November, 1910, and the second one in June, 1913, and have
been manufacturing tile continuously, and if the demand con-
tinues—as it has every appearance of doing—we will want
another machine this coming spring. The farmers are using
cement tile in this vicinity almost exclusively, the clay tile
plant having gone out of business. We charge $40.00 per M
for our 6-inch tile, making them at the rate of 1,500 each
machine per day, with two men to each machine. We have
received many compliments on the quality of tile we turn
out, and the farmers much prefer our tile to clay. We have
received one order for 70,000 4-inch tile and orders for 30,000
other sizes."

Detailed information on the tile business will be gladly sent
free upon request by the W. E. Dunn Mfg. Co., 4136 Fillmore
St., Chicago. (Trade Notes Dept. continued to page 136.)
"ESTIMATING
AND
CONTRACTING"

A Practical Manual of Up-to-date Methods of Rapid Figuring of Costs for All Kinds of Modern Construction

Newest, Largest, Most Complete Estimating Book

900 PAGES of Accurate, Reliable, Simple Ways of Figuring and Checking Quantities and Prices of Materials and Supplies, Labor Costs, Working Tables for All Details of Construction, and a Vast Amount of Other Useful and Practical Information.

HANDY POCKET SIZE Pages 5x7½ inches, Rounded Edges, Printed on Fine Quality Super-Calendar Paper, Bound in Limp Leather, Cover Stamped in Gold.

With One Year's Subscription $3.00

American Carpenter and Builder

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
Avoid Mistakes

A mistake in estimating means the difference between a profit or a loss on a contract. In these days of modern construction, it is not safe to guess or go by “rules of thumb.” Even experienced contractors who rely upon eyesight or rough calculations make costly errors.

Easy to Overlook Details

It is mighty easy to overlook some important detail if it is not down in black and white. Profits are lost because prices are too low. Be on safe ground; have a reliable, accurate guide to help you in your figuring.

Helps to Easy Figuring

It gives quotations and other data indicating the cost of materials and labor; standard schedules and forms used for measurements and estimates; labor-saving tables; and all other points a contractor, builder or cement user should know.

CONDENSED SUMMARY OF SUBJECTS

Estimating and Contracting

Partial Table of Contents

ESTIMATING AS A SCIENCE
General Principles of Estimating.
“Estimating Essential” to All Successful Business Operations.
Requirements of the Good Estimator.
Accuracy Versus Guesswork.
What to Avoid in Estimating.
Remedies for Inaccuracies.

ESSENTIAL BASIS OF ALL ESTIMATING
Analysis of Proposed Operations.
Cost Finding and Cost Distribution.

CONDITIONS AFFECTING COST
Local Market Conditions.
Freight and Haulage.
Rates of Wages Paid in Various Trades.

METHODS OF ESTIMATING
Comparative and Analytic Methods.
Approximate. Detailed Estimates. From Carefully Figured Data.
Estimating by Cubical Contents of Similar Structures.
Estimating by the Square of 100 Sq. Feet.
Estimating by Quantities.
Unit-Costs for Material.
Labor Costs.
Percentage for Profit.
Margin for Variations and Contingencies.

COST FACTORS CLASSIFIED
Factors Common to Construction in General.
Factors Involved in Special Types of Construction.
Factors Proportional or Accessory to Various Constructions.

COSTS COMMON TO CONSTRUCTION IN GENERAL
Leveling and Preparing Site.
Employer’s Liability Insurance.
Water Supply During Construction.
Number of Men and Teams Required.
Rates of Wages.
Cost of Superintendence.
Earth and Rock Excavation.
Foundations and Footings.
Back Filling.

COSTS INVOLVED IN SPECIAL CONSTRUCTIONS
CARPENTRY WORK
Measurements.
Timber and Lumber (Grades and Sizes).
Framing.
Sills, Joists, Studding, Columns.
Bracing.
Furring and Lathing.
Scaffolding.
Floors.
Stairs.
Porches and Piazzas.
Interior Finish and Trim.
Building Paper.
Clapboarding.
Shingled siding.

MILL WORK
Doors and Door-Frames.
Sash and Window Frames.
Blinds.
Trimmings.
Mouldings.
Columns and Capitals.
Cupboard Doors.
Stone Fronts.
Thresholds.
Stairs and Handrails.
Newels and Balusters.
Grills and Spindles.
Milkjugs and Consoles.
Chair and Plate Rails.
Wainscoting.

Prices of All Kinds of Materials

One of the most important parts of Radford’s “Estimating and Contracting” is that giving the average prices of all kinds of materials used in construction. This information has been gathered from every section, arranged, tabulated, and compared, so as to form a safe basis on which to figure on a prospective contract.

Many Years of Preparation

Radford’s “Estimating and Contracting” represents the work of many years of gathering, arranging, compiling, rewriting, and revising data of every description. This large, new book will be a standard work and an invaluable help to contractors, builders, architects, engineers, cement users, carpenters and the building trades in general.

Table of Contents Continued on Next Page

See Great HALF-PRICE Offer on Last Page
In Estimating

Wm. A. Radford, the editor of "Estimating and Contracting," realized the necessity of an accurate, reliable, complete book on Estimating when he was figuring costs in the estimating department of a millwork plant, many years ago. Since that time he has been planning and laying out the work on the broadest lines, covering all types of construction; and it is being published under his personal supervision.

Author of Many Building Books

His previous books, "Radford's Cyclopedia of Construction" (12 volumes), "Radford's Cyclopedia of Cement Construction" (5 volumes), "Practical Carpentry" (2 volumes), "Steel Square and Its Uses" (2 volumes), "Details of Building Construction," "Framing," "Cement and How to Use It," "Cement Houses and How to Build Them," "Bungalows," "Artistic Homes," "Ideal Homes," and many other building and plan books are known throughout the world as the highest authorities in their respective lines.

CONDENSED SUMMARY OF SUBJECTS—Continued

CONCRETE CONSTRUCTION

CONCRETE HOUSES
Monolithic, Prefabricated Construction. Concrete Stucco House. Concrete Floors.

CONCRETE BLOCK CONSTRUCTION

WATERPROOFING AND DAMPPROOFING

MASSONRY CONSTRUCTION—BRICK
Classification of Brick. cement Brick.


PAINTING AND DECORATING

PAPERHANGING

GLASS AND GLAZING
Measuring Amounts Needed. Grades and Quantity of Glass.

BUILDERS' HARDWARE
Taking Off List of Items Needed. Grades and Quantities.

ELEVATORS
Sidewalks, Curbs and Gutters.

ROADS AND PAVEMENTS
 Bridges and Culverts.

SEWERS AND CONDUITS
Labor-Saving Tables.

ELEMENTS OF MENSURATION
Average Day's Work in Various Trades.

SHORT CUTS IN COMPUTATION

USEFUL MISCELLANEOUS DATA, RULES, etc.

An Up-to-the-Minute Book

Radford's "Estimating and Contracting" is a big, practical, up-to-the-minute book for the lumberman, contractor, builder, cement user, carpenter, sidewalk and paving man, architect, draftsman, plumber, painter and plasterer, as well as all other men whose work is in the building or construction field. Even the home owner can use it to excellent advantage in checking the costs of his home or its fixtures.

Most Complete Estimating Book

Radford's "Estimating and Contracting" is fully illustrated with drawings, diagrams, details, etc. It includes the wage scales of all classes of skilled or unskilled labor in construction and building in all cities of 25,000 and over. The building codes of a number of American Cities are also summarized.

Completely Covers Cost of Construction

Ready reference tables, short cuts in figuring, and many other helps in estimating are a prominent part of the book. In short, everything that enters in any way into the finding or checking of costs in any department of construction can be readily referred to. It shows the easiest and most common-sense way to get the desired results. Its methods, explanations and tables can be used with perfect confidence in their correctness.

Next page tells HOW to get this book at HALF-PRICE

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
This Big Combination for only $3.00

AMERICAN CARPENTER AND BUILDER
AND
ESTIMATING AND CONTRACTING

No Lumberman, Carpenter, Builder, Contractor or Architect can afford to be without the World's Greatest Building Paper and the Best, Biggest, Newest Estimating Book

Just fill out the Coupon and mail it today, together with $3.00 (at our risk) and we will send you for your money:

1. THE AMERICAN CARPENTER AND BUILDER for one year, the largest, best edited, most handsomely illustrated magazine for the lumberman, contractor, builder and carpenter, or any one interested in building—160 to 200 pages each issue.

2. RADFORD’S ESTIMATING AND CONTRACTING, a 900-page, profusely illustrated, beautiful leather-bound book. Size of pages, 5x7½ inches. Over 1,000 separate subjects are covered in this book.

3. FREE PRIVILEGES OF RADFORD’S CONSULTATION BUREAU, giving its members full information on any question relating to building, engineering, paving, plumbing, heating, painting, sanitation, etc., as well as advice on where to buy materials, supplies, machinery, equipment, tools, and other articles to the best advantage.

This Offer is open to New or Old Subscribers, but in all cases remittance to cover cost ($3.00) must accompany order.

Your money will be returned if you are not entirely satisfied with paper or books.
American Carpenter and Builder 131-134, 133

Meadows

Grain Elevator Information Free

Free Crib and Granary Plans

Buildings 36 feet or less in length with half pitch roofs need no cupola. Elevator is confined to one side of driveway. Shipped complete in sections ready to install. Write now for complete information. It does not obligate you.

The Meadows Manufacturing Co. - Pontiac, Ill.

Myers Electric House Pump

For use with open or pneumatic pressure tanks
A modern equipment for city or suburban homes. An outfit that will supply any household with water without labor or attention.

F. E. Myers & Bro., Ashland, Ohio

Let it be the "Camp" Grain Elevator

Of course you want to install and recommend only such grain elevating equipment that you know is 100% efficient.

Let us send you our FREE illustrated catalog, also FREE plans showing how this machine should be installed. The "CAMP" is the only hydraulic make on the market—be sure to make comparisons before deciding.

You will see at a glance that the "CAMP" is the "always service and result giving" GRAIN HANDLING EQUIPMENT.

Camp Brothers & Co.

Dept. 15 Washington, Illinois

When writing advertisers please mention the American Carpenter and Builder
A special money saver for you—
Yep!—that's just what it is—a special money saver especially for the builder and general contractor.
Don't use hand labor—too slow—too much labor—too much expense.
Put an Ideal "Single Line" on the job. Always ready, powerful, and will pay for itself in just a few weeks.

Start it off—requires no skilled attention.
Steady worker—built in two sizes, 4 and 6 H.P. type; capacities, 900 and 1,500 pounds. Operating cost per day less than any other hoist on the market. Adapted to work anywhere. No builder or contractor should be without one.

Ideal "Single Line" Hoists
Built—steel skid mounted, small floor space, 10-inch winding drum, extra strong brake. Drum will handle 650-foot 1-inch cable. Running speed 100-125 per minute.
All hoisting rigs equipped with Ideal Type M Engines.
These engines specially designed for contracting work.
Complete catalog 415 will gladly be mailed upon request. May we hear from you?

Original Gas Engine Co.
R. E. Olds, Chairman
630 Kalamazoo Street East
LANSING, MICH.

This Lamp Will Hang Anywhere
The lamp shown in the accompanying illustrations possesses many features that are unusual. It has various arrangements in the base that can be used to fasten it to anything. There is a spiral spring that can be used as a clamp or it can be used to fasten the lamp to the wall. There is also a suction cap that will hold the lamp on a smooth surface such as a mirror, as is shown in the illustration.
The whole arrangement can be folded into a top-like ball when not in use.
The lamp can be used at a desk; it can be fastened to a chair; it may be used for the dressing table; or for shaving, as shown in the illustration. It would be very handy to have around because of its adaptability. A circular describing some of the many uses of this light can be obtained from the Wallace Novelty Company, 22 East 41st St., New York City.

"Creo-Dipt" Shingle Booklet
This is a mighty interesting and instructive booklet that the Standard Stained Shingle Company has recently issued showing many of the artistic ways of using their shingles. It is very profusely illustrated with photos of buildings of various kinds in all sections of the country on which "Creo-Dipt" stained shingles have been used in various ways.
The manufacturers make the point that a great saving and much better results can be obtained by the use of these shingles than can be obtained by attempting to stain them on the job without adequate apparatus.
The material for staining their shingles is a finely ground pigment that is carried in creosote oil, which insures its penetration into the fibres of the wood.
Builders and contractors should be familiar with this material and its possibilities, and can obtain particulars from the Standard Stained Shingle Company, 1028 Oliver St., North Tonawanda, New York. They will also send samples of the thirty different colors on wood, in which their shingles are finished.

Northwest Building Material Exhibit to Establish Reference Library of Trade Literature
We are informed that the management of the Northwest Building Material Exhibit, which occupies the entire fourth floor of the First National-Soo Line Building, Minneapolis, will establish a reference library for the use of contractors and architects. They will gladly receive and place on file catalogs and circular matter pertaining to building materials and building equipment.
Don't Pay For Your "Ellis" without getting it

Every carpenter or contractor who does not use a reliable engine is paying for the engine without getting it. He pays for it in lost time, and in labor costs. You can buy an Ellis Engine cost of two weeks' wages to one workman; and your Ellis will give you reliable service for many years.

Ellis Engines are America's favorite with carpenters, contractors and builders. Very compact in design; light in weight in proportion to power. Easy to operate; no cracking. Run either way; reversible while running. They work successfully on common cheap lamp oil at a fuel cost of

6 cts. for 10 hours

for each horsepower developed. Just the thing for wood-workers, rip-saws, planers, cement mixers, hoists; in fact for every job where power can be used. Write for free book "Engine Facts" giving valuable information and full details of our 30 Days' Free Trial Offer, with opinions of users from all parts of the world.


"NEPTUNE" Pneumatic Water Supply Systems

"NEPTUNE" Gasoline Storage Tanks

Big Money Makers for Builders

Our Neptune Gasoline Storage Tank is easily sold to building owners who have automobiles. Install it in building your next garage. Quick profits. Tank excavated in and out; covered outside with preservative paint. Rivelless construction. All brass pumps, levers, key, etc. FHA-3-look all sizes with bright colors and approved by Underwriters. Low price makes the Neptune a ready seller.

Write today for prices and Catalog V. A. B.

Fleck Brothers Co.,
50 N. 5th St.

Up-to-Date Ideas for Up-to-Date Builders

GENERAL SUMMARY OF CONTENTS

Ruford's DETAILS OF BUILDING CONSTRUCTION is a complete manual of Building Practice, as applied to carpentry, construction and the use of millwork. It is a remarkable collection of full-page plates, accurately drawn and reproduced to exact scale, showing clearly every detail of modern building construction and finish. These plates make plain the framing and construction of residences of every type—frame houses, brick houses, brick-veneer houses, "stucco" or cement-plaster houses, cement block houses, etc.

200 Pages of Live Information

200 pages of illustrations, with thousands of details, including a section showing home furniture making.

Every part of a building is shown in Ruford's DETAILS OF BUILDING CONSTRUCTION. All dimensions, angles, curves, measurements and joints are made so plain and are so well illustrated that the "man on the job" will have no trouble or difficulty in doing the work. It has all been figured out by men who have made a lifelong study and success of architecture and building.

This book and a year's subscription to the American Carpenter and Builder for only $2.00, the regular price of the magazine alone.

AMERICAN CARPENTER AND BUILDER --- 1827 Prairie Ave., CHICAGO

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
Stanley Works Exhibit at Big Fair

The Stanley Works of New Britain, Conn., are exhibiting their manufactured products, consisting of shelf builders' hardware, box strapping and cold rolled steel at the Panama-Pacific International Exposition. The display occupies a floor space of 400 square feet with 260 square feet of wall space on which the products are shown. The architecture of the booth follows the Mission style and is in harmony with surrounding exhibits; the interior being finished in quartered oak.

The exhibit proper is displayed on fourteen panels in cases with sliding glass doors, lighted by concealed electric lights. Some of the most popular lines of hinges, plated butts, door bolts and shelf brackets are shown in practically all sizes and finishes. At the rear of the booth is a pair of full sized garage doors, equipped with Stanley's latest garage hardware. There are also seven models, showing ball bearing butts, half surface butts, blind trimmings, screen hardware storm sash equipment, garage hardware and casement hardware, in actual size.

A large butt or hinge of unique design is displayed. This hinge is 24 inches square and weighs 90 pounds. It is the largest door butt ever manufactured and is finished in "Stanley Sherardized" and plated finish, which is so popular just now where moisture is apt to affect the finish.

Box strapping in various designs and widths, box fasteners, case seals, corrugated fasteners, are shown in an attractive manner. There is also an actual photograph showing six cases, with Stanley box strapping, shipped from New Britain, Conn., to Colombo, India, and back to New Britain, weighing over 250 pounds each, traveling 78,000 miles. The cases were not broken or the contents damaged.

The Stanley Works extend a cordial invitation to all its friends among the dealers, architects, builders, carpenters and general public to see this exhibit at close range in their booth in the Palace of Manufactures, Block 26, 5th street and Avenue D.

MOLDS FOR Poured CONCRETE BRICK.
The greatest labor saving device ever used in the manufacture of concrete products. For common and faced brick. Molds are made of No. 18 gauge, spring steel. Price per section (7 molds) $1.40. Investigate.
MERRILL MOORE, 411 W. Montgomery St., Creston, Iowa.

MOLDS FOR Poured CONCRETE BRICK.
The greatest labor saving device ever used in the manufacture of concrete products. For common and faced brick. Molds are made of No. 18 gauge, spring steel. Price per section (7 molds) $1.40. Investigate.
MERRILL MOORE, 411 W. Montgomery St., Creston, Iowa.

"H"AMMER-WRENCH
THE "E-I-T" HAMMER-WRENCH IS MORE THAN THE BEST HAMMER

It is that, and a perfect wrench combined
For general carpenter and concrete form construction work, the "E-I-T" Hammer-Wrench is the ideal tool. It requires no adjustment—just a turn of the hand and either a hammer or a wrench is instantly at the mechanic's disposal. It saves his time, and reduces the bulk and weight of his tool kit.
Have your dealer show you one, or send $1.25 with his name, to the home office.

When Writing Advertisers Please Mention The American Carpenter and Builder
Gas and Oil Engines for Pumping, lighting, hoisting and power service.

1 1/2 to 400 H. P.

THE FRÖS GÁS ENGINE CO. SPRINGFIELD, OHIO

One fair sized job pays its entire cost

Bores, planes and rips at the same time
NOVÉ ENGINE CO.
496 Willow St., Lansing, Mich.
CLARENCE E. BEMENT, Secretary and Manager

GOLD ★ MEDAL FILES

$1.00 PER DOZEN

You Save 20 Cents Buying Gold ★ Medal Files in Dzen Lots—20 Cents Saved is 40 Cents Earned

Gold ★ Medal Files Save Users Money. They last longest and cut fastest. With a Single Edge you can sharpen fifteen saws. You can do this because they are skillfully made of the best Crucible Steel.

Ask Your Dealer for Gold ★ Medal Files

If he cannot supply you we will send you a dozen files as illustrated for $1.00 or one or less than a dozen at ten cents each. We recommend a dozen as you can always use them yourself or sell them to your men or fellow carpenters.

LIVERIGHT BROTHERS
North Philadelphia, Penna.

Put Chief Everlasting Windows In That Cellar

They will please the man you're building for better than any other type of window you could install. They're the modern cellar window solution of the window problem for the man who wants window satisfaction in service. Built of steel and in complete units—hinged windows—Chief Cellar Windows leave no chance open for window troubles. They always open and close easily, leave no open cracks and are absolutely unaffected by the weather.

Leak Proof—Rot Proof—Rust Proof
Chief Cellar Windows can't leak, rot or rust. They are enduring—good for a lifetime of service. They have every good quality of the old-fashioned, wooden window with the added advantage of steel construction.

Chief Cellar Windows are easy to install, cost no more than wooden windows and are worth three times as much. They give real service—permanent, satisfactory service. They satisfy your customers with Chief Windows. They'll all want them when they see them and they're profit for you in selling and installing large modern windows.

Write us today for full description and prices.
SHRAUGER & JOHNSON
430 Walnut St.
Atlantic, Iowa.

Still Nameless!

We certainly have received a big bunch of good suggestions as to what we shall call our new time-saving Material Elevator. There are so many good ones that we haven't decided which one to adopt yet, but our ad next month will surely contain the name of the winner.

A Few Facts about this Material Elevator

It is an actual fact that this Building Material Elevator will save you 25 per cent of time and labor—which means that it will decrease operating expenses 25 per cent or increase your profits 25 per cent. It can be operated by hand, or driven by an engine or a horse. It is quickly and easily erected and will do away with hod and wheelbarrow.

Write for particulars about this new improved Material Elevator and find out what it can do.

LIVE AGENTS WANTED all over the country. We have a very liberal proposition to offer you.

H. B. Sackett Screen & Chute Co.
Main Office and Warehouse
1683 Elston Avenue, - - CHICAGO
Branch Warehouse
197 Medford Street, CHARLESTOWN, MASS.

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
Add to Income and Prestige

Do It the New-Feed UNDERFEED Way

You can offer to install a New-Feed UNDERFEED Furnace or Boiler with every confidence—confidence in doing a good job—and confidence in the coal and money saved for your clients.

For, remember, we guarantee a saving in coal bills of one-half to two-thirds wherever the NEW-FEED is properly installed and operated.

WILLIAMSON NEW-FEED CO.

The New-Feed UNDERFEED will continue to advertise you long after it is installed. It will win for you by winning for itself. And that’s a point well worth remembering.

HOW IT WORKS

Burns cheaper grades of coal. Coal fed from below. So simple, a boy of 12 can operate it. No smoke or gases. Ashes clean, white and few.

Write for a copy of "Money-Making Sales Plans for Under-Feed Dealers" and full details of "Exclusive Sales Rights Proposition."

Write today—right now.

THE WILLIAMSON HEATER CO.
(formerly Peck-Williamson Co.)
267 Fifth Ave., Cincinnati, Ohio

Extra Money

for CARPENTERS

and CONTRACTORS

No Work to Do!

Just as Easy as Signing Your Name

Write for Explanation of this unusual offer. Address

C. W. DOBBINS

Superior Door Holders

To hold your door open there is nothing better than a Superior door holder. This is a neat, strong and durable device that is operated by foot pressure. It cannot injure any kind of floor or carpet, nor has it any projection to catch on garments.

This holder is for use on all doors equipped with spring hinges or door checks.

They are made in three sizes to take care of from the smallest to the heaviest door, by the Superior Spring Hinge Co., 136 W. Lake St., Chicago.

Sheet and Tin Plate Exhibit at San Francisco Exposition

One of the most interesting parts of the exhibit of the United States Steel Corporation and Subsidiary Companies at the big Pan. Pac. Fair is the part showing the various uses and the latest developments of sheet and tin plate. This part of the exhibit shows the products of the American Sheet and Tin Plate Company.

The whole exhibit is so arranged that the entire process, from the iron ore in the ground to the finished material, can be followed. This whole series of operations can also be followed in a motion picture that is being shown in the exhibit. The latest applications of sheet metal and achievements in one piece construction are shown in many artistic designs. The exhibit is in the Palace of Mines and Metallurgy.

The American Sheet and Tin Plate Company have recently issued several interesting and well illustrated books showing the application of sheet metal to many varieties of work. These books take up their copper alloy steel which is shown in tests, of which photographs are taken, to have remarkable corrosion resisting properties. A card addressed to this company at the Frick Building, Pittsburgh, Pa., will bring these valuable reference books.

Instructive Exhibit Shows Uses of Carborundum

Prominent among the remarkable exhibits at the San Francisco Fair is the display of The Carborundum Company, Niagara Falls, N. Y. The illustrations on page 142 give some idea of the attractiveness of the display, but beauty of construction and arrangement were not the sole ideas in planning the exhibit. Industrial education was the big idea embodied, for any visitor to the Carborundum exhibit will

BE OUR AGENT—

Builders and Contractors can make good money acting as our agents. You can save the buyer 30% in Fuel Bills. Why not sell Jahant Down Draft Furnaces On 300 Days’ Trial

In your business you have the opportunity to make the sales. Jahant Down Draft Furnaces have a record for merit behind them. You are selling a first class article at a saving to your customer.

Send for Free Catalog

The Jahant Heating Co., 300 Steiner Ave
AKRON, OHIO

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
The Latest "MAJESTIC" Building Specialty

A Milk and Package Receiver that is 100% efficient.

Consists of two cast iron frames and doors joined by a body adjustable to different thickness of walls. Locks with a gravity latch and can be unlocked only from inside.

Can be easily installed in house already built as well as in new construction. Finished in baked enamel, nickel trimmed. Costs but five dollars.

If you have not received your 1915 edition of Majestic Catalog, please write us and we will send you another.

THE MAJESTIC COMPANY
Huntington, Indiana

The "Ottomatic" Coal Chute
Patented Sept. 15, 1914
Fire Proof-Burglar Proof-Fool Proof

Best—Indestructible—the One Operation Chute—Locked in Both Positions.

No. 1, 17x24", wt. 100 lbs... $13.00
No. 2; 22x33", wt. 150 lbs... . 17.00

CAN BE PUT IN OLD OR NEW BUILDING
Special Discount to Agents

THE MAXIMILIAN CO.
844 Monadnock Block Chicago, Ill.

"BEST" Stud Socket Fits
ALL SIZE TIMBERS

For Concrete Floors and Foundations, the "Best" Socket is the easiest installed and the easiest to set the studs in. The holes in back permits the placing of reinforcing rods or wire, if desired. Studded fastened with either a bolt in the large hole at side or nails at the side and end. We also make a special corner socket. Write us for circular and favor us with your dealer's name.

We make the "Best" Line of Building Hardware and Cast Iron Specialties and will be glad to furnish information in regard to it.

Sterling Foundry Co.
8 Avenue A, STERLING, ILL.

Don't Forget

a Coal Chute—
A modern residence or building is incomplete without one. But be sure it's a

CANTON COAL CHUTE

There are a host of reasons why a Canton should be your choice. First—the Canton is made by a foundry with years of experience, and you can depend on every casting to be high grade and substantial. Its design is very neat and pleasing and it will add to the appearance of a wall. It can be either a high grade or a low grade, whichever the owner wishes. It is absolutely burglar-proof and cannot be pried or "jimmied." Last—but specifying a Canton you will guarantee everlasting satisfaction to your customer.

The Canton comes in two sizes and is very easily set in the foundation wall. We'll be very glad to send our book of Builders' Iron Work, free on request. Ask for Book No. 1-2.

Canton Foundry & Machine Co.
Open Canton 11 11 11 Ohio

If You Build Buy Own

Be up to date and have the world's best

The Window Chute
for your coal bin.

Thousands in Use
The Very Best

Write for Booklet C.

Holland Furnace Company
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World's Largest Direct Installers of Furnaces.

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In the center of the exhibit is a wonderful fountain, built of irregular masses of the wonderfully iridescent Carborundum crystals over which real water plays, splashing into a marble basin, the coping for which was moulded with Carborundum wheels. The jewel-like fountain is 12 feet high and is strikingly beautiful.
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WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
Specification for Flat Slate Roof Over Concrete

The following specification has been prepared by the Bangor Slate Association to furnish reliable information to architects and builders on flat roof construction using slate. This specification is for use over concrete, and supplements that given last month for use over wood sheathing.

Surface: Concrete surfaces shall be properly graded to outlets and formed to drain all water from the roof by the concrete contractors, and the roof surface shall be finished smooth and hard and shall be thoroughly dry. All rubbish shall be removed by the contractors preceding the roofer.

Application:

First—Coat the concrete uniformly with hot specification pitch.

Second—Over the entire surface lay two (2) plies of specification tarred felt, lapping each sheet seventeen (17) inches over preceding one, mopping with specification pitch the full seventeen (17) inches on each sheet, so that in no place shall felt touch felt.

Third—Coat the entire surface with specification pitch.

Fourth—Over the entire surface lay three (3) plies of specification tarred felt, lapping each sheet twenty-two (22) inches over preceding one, mopping with specification pitch the full twenty-two (22) inches on each sheet, so that in no place shall felt touch felt. Use an average of one hundred and forty (140) pounds of specification pitch to one hundred (100) square feet of roofing.

Fifth—Spread over the entire surface a uniform coating of Warren's No. 144 genuine Bangor roofing asphalt, using an average of fifty (50) pounds to one hundred (100) square feet, into which, while hot, thoroughly embed genuine Bangor slate; grade*. size.. inches by.inches (grade and size to be inserted); slate to be perfectly dry when placed.

Flashings: Flashings shall be constructed as shown in detailed drawing.

Inspection: The roof may be inspected before the slate are applied, by cutting a slit not less than three (3) feet long at right angles to the way the felt is laid. The cut can be repaired by sticking five (5) thicknesses of felt over it, and the spot will then be as strong as any part of the roof.

Note.—We advise incorporating the full wording of the specification and inserting roofing details in plans in order to avoid any misunderstanding. If an abbreviated form is desired, the following is suggested:

Roofing—Shall be a Genuine Bangor Slate Roof For Flat Surface (for use over concrete) laid as directed in printed specification, issued March 1, 1915, using the materials specified, and subject to the inspection requirement.

*Bull Dog* Equipment

"Bull Dog" engines, hoists, building material elevators, and pumps for contractors are described and illustrated in a pleasing catalog issued by the Bates & Edmonds Motor Company. Contractors and builders should become acquainted with their line, as it has many good features. Their hoists and diaphragm pumps are often made up with the "Bull Dog" engine attached and all ready to run. Builders can secure this catalog by writing to the above mentioned company at Lansing, Mich.

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