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Turn to page 100 and see a photograph of one of these binders. You will want several of them. Send for them now. If you are not pleased when you receive them, we want you to return them and get your money back. Complete satisfaction or money back, is our business corner stone.

Index to Vol. XIV Sent You Herewith

In order that you may refer quickly and easily to any article, item, plan or detail contained in any of the issues of the American Carpenter and Builder of Vol. XIV (Oct. 1912 to March 1913) we have prepared an elaborate and complete Volume Index.

You will find this Volume Index slipped into this issue of the magazine. We recommend that you take this out and paste it into the front of your Vol. XIV when you bind it up. Carefully preserve this Volume Index. It has cost a lot of study and work to prepare this, and considerable money to print it. We want you to save it, and to use it.

The Binding Covers will keep your magazines clean and un torn and handy to refer to. The Volume Index will open this treasure house to you for quick reference. In the course of a year pretty nearly all the phases of a builders’ business are fully explained in the American Carpenter and Builder. Preserve and bind your magazines and you will build up your own cyclopedia and reference library of carpentry, architecture and builders’ work.
It is very unfortunate that in the public mind housing reform has been identified with tenement house reform. Because of this, if you begin to talk anywhere today about better housing you will soon be met with the statement: “Yes, but there is very little interest here in that subject for there are practically no tenement houses in this city, or in this town.”

A few months ago a gentleman was showing me over the beautiful residence district of an attractive small city of the farther Middle West. After an hour or two of this I said, “Now, let me see how the other half lives.” “The other half?” he replied, “why, there isn’t any to speak of, I don’t believe we have got a tenement house in this whole town.”

I have no doubt he was right; but for all that in ten minutes we were in a quarter of the city which in some respects was as wretched and miserable as the heart of the tenement house district in New York or Boston. We stood in front of a row of five small, low, two-story, wooden buildings, neatly painted a bright yellow and altogether not a bad looking collection of dwellings, but going behind them there was a different scene. These five houses held about forty people. The only water supply for them all was a single hydrant in the yard; the only convenience for the disposal of waste was beside the hydrant; and naturally the yard was swimming with slops and dish-water; the only privies were two or three open privies also in the yard. In fact, the ordinary requirements for decent living were all in the yard, and, as nearly always happens in such cases, the conditions were indescribably filthy.

Here was a well developed housing problem but no tenement houses.

The truth is that except in New England and in the metropolitan districts of some of the larger cities tenement houses are few and far between, and the problems which have their origin in the multiple dwelling do not exist; but there is a housing problem wherever there are houses, as appeared in this western city, whether they are occupied by one family or more, and housing reform is a nation-wide necessity.

What has just been said applies with especial force to housing or housing reform in the country and in suburban towns. It should be clearly understood that for the most part the tenement house problem does not enter into this question at all. In New England it does and I shall have something to say about conditions there in a minute; but outside of...
Small-Town Slum

THE REMEDY

By Elmer S. Forbes
Chairman Committee on Housing, Massachusetts Civic League, Boston, Mass.

New England, so far as my own observation goes, the tenement house in country and suburban districts, with the exception mentioned, is practically a negligible quantity.

More or less bad housing is to be found in the country all over the United States; but in some respects it is not so bad nor does it have the same causes as in the cities. The dwellings in question may be fairly built or be miserable shacks or anything between the two; but whatever they are, dirt usually reigns supreme within doors, they are apt to be crowded to the limit, water to be scarce, and sanitary conditions unspeakably vile. On the other hand, there is plenty of space and fresh air and sunlight, at least outside, there is no block nor lot overcrowding, and rooms without windows, while not unknown, are not very common. The essentials of decent living are within reach; and, if the house and the life that goes on within it are wretched, it is not often the fault of the speculative builder or of the grasping landlord.

Neither does the high value of land nor an excessive ground rent account for it, for you find these slum spots where the land is almost worthless.

When we turn to the suburban towns and the small cities of fifty thousand population or less we face a different proposition. Here we are dealing not alone nor principally with the shack occupied by the decadent family but with the housing accommodations of every class of society; and we run the gamut of housing abominations. As has been said, except in New England there are almost no tenement houses in these towns; but some of the worst living conditions it has ever been my fortune to see have been in small, one-family houses in different parts of the country, and especially in several western communities. Hundreds of these dwellings may be found crowded together in the most undesirable locations devoid of everything which makes decent living possible. At the moment I can think of one spot, which can be duplicated over and over again, where half a dozen of these miserable dwellings, no one of them more than 10 feet high, stand grouped about a little open space. The one well which supplies water for them all, stands at one side in close proximity to four open, reeking privies, one of which is but 9 feet from the well, and one filthy hen yard. Nothing but the fact that the inhabitants of this district have been rendered immune to the attacks of disease could prevent them from being swept away by an epidemic of typhoid fever or something else equally deadly. Such conditions emphasize the universal need for housing law.
The same thing is indicated by conditions in suburban New England. Here we have a form of tenement house, the wooden, three-family flat, of which I wish to speak because it is spreading like the cholera or the yellow fever. It is already firmly established in the large region of which New York City is the center, and will surely make its appearance in more distant parts of the country unless measures are taken to prevent it. It was first built in New England because, as it does not fall within the local definition of a tenement house, it is not subject to any of the requirements of the tenement house law.

Its rooms may be practically closets; they may be without windows to the outer air if the builder does not choose to put them in; the plumbing can be reduced to the lowest terms; in many places the toilets may be the dangerous yard privy; and unless there are local fire regulations it is possible to build them with only one means of exit and without fire escapes. This type of dwelling is the joint production of the land shark, the shyster architect, and the jerry builder—and nothing in the way of a tenement could be worse except another of the same sort but higher. It is usually of the flimsiest construction; and after a few years the owner is likely to ask for an abatement of taxes because of its depreciation in value. It is a dangerous fire hazard, dreaded alike by the fire department and the owners of neighboring property.

It is terribly destructive of real estate values, and the coming of one such building into a residence district will cut in two the selling price of the nearby properties. Within a month a building company appeared in one of the large suburban towns in the vicinity of Boston and announced that it proposed to put up fifty of these three deckers. The people, rich and poor alike, could almost hear crashing of property values and at once took steps to ward off the impending danger and to protect themselves against similar attacks in the future.
These two examples, one from the West and the other from the East, show to what length carelessness and ignorance and unregulated greed will go in their predatory raids upon the welfare of the community. We should all agree that the exploitation of the tenant is a greater injustice than the destruction of property values, but there is no reason why either of these things should be permitted. Both are common in our suburban towns. We have heard much about the injury to the tenant but not much of the other side of the question. One of the serious results of the lack of building regulations is that no property owner, be he large or small, knows what is going to happen to him. The daily newspaper supplies illustrations of this.

"A citizen built a beautiful house within an area of 50,000 square feet of land—and presently found himself confronted by a garage. A gentleman expended $17,000 on his place, as he called it—and by and by a fellow citizen built a row of seven one-story shacks on the opposite side of the street. A third citizen, whose property cost him $50,000, awakened one morning to discover a Chinese laundry in the basement adjoining his own, and the selling price of his estate automatically reduced by that master stroke of Fate and an unscrupulous neighbor to $15,000."

A policeman in a country town which I know well, built himself a comfortable house on a generous lot and adorned it with trees and shrubs to suit his taste. Along came a speculator who planted a flimsy firetrap of a three-decker within 3 feet of his lot line, cutting off his sunlight and robbing him of half the savings of his life time. These are the tragedies of the suburban towns, and they are certainly worthy of the attention of the National Housing Association.

They do things better than this in Germany, as we all know. There you are not allowed to go on your way with no regard whatever for your neighbor. You may not kill him with an unsanitary and unhealthy house if by chance he does not own his own home and has to rent one from you; or if he is so fortunate as to own his own place you cannot rob him of his property by building some unsightly or undesirable structure in his immediate vicinity.

Why should these things be permitted in America? They need not and ought not to be. At the same time that the protection of the law is thrown around the tenant, securing him against oppression and wrong on the part of the owner of his dwelling, something should be done to preserve the beauty and attractiveness of our towns and cities, and to afford a reasonable safeguard for the property values of the homes of their citizens.

As was suggested, between the miserable one-story dwellings of the western river bottoms and the objectionable, cheap, wooden three deckers of New England every form of housing iniquity is to be found. Wet and sodden yards, filthy privies, damp and decaying cellars, dark halls and rooms, dilapidation, dirt, squalor and over-crowding, all are in evidence. The only difference between the evil housing conditions of the small village of a few hundred people and those of the city of as many thousand population is in de-
BUNGALOW BUILT BY THE ALBANY HOME BUILDING COMPANY, ALBANY, N. Y.

A Bungalow 20 x 28 ft. in size, having a combined Dining Room and Kitchen 11 ft. 2 in. x 13 ft. 6 in., a Sitting Room of the same size and two small sleeping rooms with closets and bath, all opening from a tiny hall 3 x 7 ft., which is not too much to give over to sanitation and privacy even in so small a house. The construction in this case was somewhat unusual, the walls being of concrete slabs cast on the floor and set in position with a derrick, all vertical joints were cast hollow and poured after erection with liquid concrete. The walls were furred and covered with Beaver Board without plastering, and ceilings of the same. The floor construction is tile with steel and concrete joints and a wood top floor laid on strips concreted in. The interior partitions are of fire proof plaster blocks. The whole makes a semi-fire-proof house with small depreciation and commands a low insurance rate. Built on a lot 54 x 100 ft.; sold for $1,900; rents for $17 a month.

The Three-Decker in a Country Town - A Tinder Box
In this issue will be found several of the Honorable Mention Designs from Our Big Prize Competition. Next month and in every issue thereafter others will be illustrated until all have been presented. All of these Honorable Mention Awards are of very high quality; it is difficult to choose between them. Some will even consider many of them more praiseworthy than the Prize Winners. They show the uniform high quality of the work the American Carpenter and Builder readers are doing.

Third Prize Class E—For Modern and Fully Equipped Residence Planned and Built by a Reader of the “A.C. & B.”

Large Well-Designed Dwelling at Paris, Ill.
Planned and Built by Joseph Stephens, Contractor and Builder, Paris Ill.

This modernly equipped, substantial and comfortable residence which is awarded third prize was recently completed in Paris, Ill., for Mr. Alfonso Frey—planned and built by Joseph M. Stephens, a charter member of the American Carpenter and Builder. The house is of square design, two stories high, with basement under entire house, the rooms are large, well lighted and well ventilated, and it was built with an eye to comfort, convenience and durability.

The basement consists of boiler and fuel room, cold room, and large laundry room; the latter being equipped with the most sanitary and up-to-date plumbing. The basement rooms are 8 feet high in the clear; cement floors; and the walls and entire foundation of house is built of impervious hard burned brick laid in lime and cement mortar.

The first floor consists of living room of commodious size, with brick fireplace, elegantly paneled...
stairway and built-in seat. A large Colonial opening to the left leads to the library, which is a room of splendid size, and from this room large sliding doors open directly into the dining room, which has a large bay window and splendid china closet built in. These three rooms are finished in red oak, "Early English finish," and hardwood floors; the remainder of first floor is a large kitchen with work room and pantry attached, built in cabinets and closets, and a large rear porch wainscoted and inclosed with storm sash and door in winter and screen sash and door in summer, a lavatory and closet complete this floor.

The second story has four splendid bedrooms and a living room with brick fireplace, finished floors, emanated bedrooms, one or more closets in each room, complete lavatory and bath; and a central hall from which entrance is had to all rooms.

The sanitary plumbing is complete and modern in every respect. The heating plant is a hot water system, complete in every detail, as follows: An "Ideal" boiler, "Honeywell" Generator and an abundance of radiation. Every room and closet in the house is lighted with electric lights and every room has its individual switch and cut-off.

A special feature in this house is a vent built from basement to top of large central chimney, which carries off any smoke, odor, vapor or gas from furnace room, laundry, lavatory and closets on first floor, bathroom, second floor, and smoke and odors from kitchen.

The exterior of this house is a brick veneer No. 160 Brazill, 1In., Clay Co., laid in black peora mortar struck V-shaped joints and anchored every fifth course to lining, which covers the entire outside of frame structure. An air space of 1 inch is left between this lining and the brick work; and before brick work was put up the entire outside of lined surface was covered with "Neponset" water-proof paper.

The roof is likewise lined solid, covered with slaters felt and then roofed with H. W. Johns-Manville Co. asbestos shingles, French method. The porches are roofed the same as the house, and the porch floors are reinforced concrete.

"This house was planned and constructed entirely on my knowledge of the building business obtained through experience and observation, and a careful reading of every number of the American Carpenter and Builder, of which I now have on file in my home a copy of every issue, to which I frequently refer."

**HONORABLE MENTION DESIGNS**

Bungalow with Special Lighting Features

**ARTISTIC 6-ROOM DWELLING AT NILES, MICH.**

Design Adapted and Structure Built by

**Eycleshymer & Snyder**

Contractors

 Builders of Good Houses

*Niles, Michigan*

Live Builders in a Live City of 5,200

We submit herewith, photos showing two views of a bungalow we have just completed for Mr. Leroy Latham of our city. Also drawings and photos of special electric shades for lights.

While the original general design of this house is taken from a bungalow book, and we do not profess to be architects, we believe our work of arrangement and general planning makes us eligible to make this entry in your (Class A) competition.

We started this house in October and completed it February first.

This is a pure example of bungalow. Every detail is carried out consistently, inside and out. It sits low on a concealed brick foundation and seems to have grown into its environs.

Casement windows, opening out, are arranged with a view of setting every piece of furniture to the best advantage.

It has six rooms and bath, and finished cellar and attic. Inside wood finish is dyed Circassian walnut, with exception of owner's bedroom, bath, and kitchen—the bedroom trim being ivory enamel, and the bath and kitchen white enamel. Bath room has four foot wainscoting of hard plaster, ruled to represent tile. The kitchen has built-in cabinets.

Stairways to cellar and attic are placed on enclosed
porch, where also is provided space for refrigerator.

Sand finished walls painted with flat oil tints—living room, dining room, hall, and two bed rooms being in olive grey to four inch moulding that runs flush with window and door casings, and slightly lighter tint of same color from moulding to strip running around ceiling, ceiling a still lighter shade of same color.

Owner's bed room walls and bath are of heliotrope, with reduced shade for ceiling. The kitchen walls are of grey tint with lighter grey ceiling.

The lights are specially designed, built of copper and opal glass, and so arranged that a comfortable chair, which has been placed at a window for day reading, may have as good light at night without moving. Hardware of old copper with glass knobs.

EycleShymer & Snyder, Niles, Mich.
Fine Modern Residence Built under Difficulties

Editor AMERICAN CARPENTER AND BUILDER:

This is a house planned and built for Mr. W. Keesey of Fort Davis, Texas, situated 22 miles from the Southern Pacific R. R. The house is built of a native gray sand stone laid in rubble work. The porches are of the old Southern Mission style, made of reinforced concrete. The roof is 4-inch dimension cedar shingles.

The interior of the house is of a slow burning construction having metal lath and plastered walls, with beautifully designed and decorated metal ceilings.

The house has a hot water heating system, an acetylene lighting plant, installed in a stone building built for the purpose 10 ft. from the house. A hand elevator runs from the basement to the attic. There is a galvanized iron lined clothes chute and a most complete laundry equipped with three porcelain laundry trays, a four bar clothes dryer, washing machine, mangle, etc. The three bath rooms are equipped with the best plumbing fixtures on the market.

There are six beautiful oak wood mantles. The trim of the first floor is oak with paneled wainscoting in dining room, breakfast room, reception hall and stairway. Special attention being given the parquet floors, which are layed in artistic design in oak, maple, cherry and black walnut.

The trim of the second floor is of native pine with rift-sawed pine floors. The windows are equipped with Venetian blinds on the inside and extra heavy copper bronze wire screens on the outside. An unique feature of this country are the red cedar lined clothes closets.

Owing to the fact that no architect, lumber dealer, mill man, or material man was ever on the job, all the equipments and material were either ordered...
through a reliable firm 450 miles away or direct from the manufacturers.

The American Carpenter and Builder was always on the job and played a very important part as many of the equipments were ordered through its advertising columns, and details of trim were cut from its pages and sent to the planing mill.

This is my seventh year as a reader of the American Carpenter and Builder. I still have my first and every other copy and value them highly. I have many good reference books but none better then the current issue of the American Carpenter and Builder.

Chas. Tyte,
Fort Worth, Texas.

What Reading “A. C. & B.” Ads. Did for Me

Editor American Carpenter and Builder:

About two years ago I had a copy of the American Carpenter and Builder shown to me; and thinking I should like to take some building paper, I decided to subscribe for it. The first copy or two I was not very well pleased with, as it seemed nearly all ads. But on looking through these ads one day, I saw one about cement brick machines. Being a bricklayer and knowing how scarce clay brick is getting, I thought perhaps there was a good opening for a machine here, although cement brick is quite a new thing in this part. I got several catalogs from some of the firms that advertise in the American Carpenter and Builder and made a dash not only in bricks, but also tiles and sewer pipes, lawn vases, etc. I find a ready market for all I get time to make.

A few months ago I heard of the Frankford Canning and Preserving Co., wanting to locate here, so I got right after them and secured the contract for a building 40 by 90 by 23 ft. walls with cement brick. I got my brick machine on the ground and started making the brick, which took about 115,000, and when completed gave every satisfaction. I have to erect a building 48 by 200 by 20 ft walls this year for the same firm.

Since doing this job I have shipped several carloads to different places and could not supply the demand. Must say I have had a pretty good year. Thanks to the ads in the American Carpenter and Builder, which I have to put the blame on for starting in this new and money making venture.

Alfred Larry
Grafton, Ont.

Cement Brick Structure Built by Alfred Larry, Grafton, Ont., Out of Cement Brick of His Own Manufacture

I am now erecting a house from the set of plans given in the 1911, September number and have had several offers already. The building is not half finished. It is going to be a very compact and convenient house when completed. Alfred Larry.
Editor AMERICAN CARPENTER AND BUILDER:

PLEASE enter me in your contest in Class C for this farm barn, which I began June 17 and finished July 20 for Mr. Axel Vold, three miles and a half east of Ellsworth, Ia.

Following is the cost of material:

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
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<tbody>
<tr>
<td>Lumber</td>
<td>$1,050.00</td>
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<tr>
<td>Masons</td>
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<tr>
<td>Gravel and sand</td>
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<tr>
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<tr>
<td>Lightning rods</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$2,082.00</strong></td>
</tr>
</tbody>
</table>

The barn is equipped with Louden litter carrier; the track starts in the box stall on the east, goes north back of horses, turns and goes west on the side of northeast stall, crosses alley between horses' mangers to northwest stall, turns south back of horses, crosses cows' feed alley through door in stanchions down west side of cow section, turns and goes back of cow stall drop, out at east door.
The photo shows barn with Queen cupalo which was decided on after my plans were drawn for hexagon cupalo.

This barn is also equipped with Peters sliding door locks, opening from either outside or inside. Other doors are equipped with Peters barn door latches.

The barn has a Myers triple hay carrier. Lightning rods are Doods and Struthers.

Being glad to see our paper grow, I remain an interested reader.

Geo. B. Holt,
Carpenter and Framer,
Ellsworth, Ia.

**A Model Farm House**

**Planned and Built by D. A. Haines, Mabel, Minn.**

**HERE** is a statement of materials and equipment used in the construction of a farm residence I planned and built for Mr. Will Haines near Hesper, N. Dak.

The residence is a combination of cement blocks and frame construction. It has a full basement with a 12 inch concrete foundation walls up to grade, above grade hollow cement blocks are used. Atlas Portland cement was used in all the concrete and cement work. The entire basement floor is cemented; the basement is divided into a laundry, a preserve cellar, two vegetable cellars, a coal bin, a boiler and a work room. The laundry is equipped with stone laundry tubs, a laundry box with a clothes chute extending up to the bath room on the second floor, a laundry stove and all modern plumbing fixtures.

On account of such severe freezing in that country the cistern was placed in the basement, and is supplied with a force pump with which to pump the water into the storage tank in the attic. The vegetable and preserve cellars are partitioned off with 8-inch concrete walls, and have cupboards for storing away canned goods, etc. The coal bin is partitioned off with No. 2 flooring. The dumb waiter pit extends 5 feet below the basement floor and the walls are built of brick, plastered on the inside. It is equipped with a carriage operated with a crank located in the kitchen.

The first story walls are constructed of concrete blocks—a double wall each 3 3/4 inches thick with a continuous 2 1/2 inch air space between. The outer wall is pointed up with dark colored mortar. The water table, caps and sills are cement and white sand mortar, which gives a perfectly white color. All outside cement and concrete work is waterproofed.

The second story is frame construction. The dimension stuff is all No. 1 white pine. The outer walls are sheathed with No. 2 fence flooring, lined on the inside with Cabot's sheathing quilt, and on the outside with 35-lb. red rosin paper, and covered with cedar shingles - 5 to 2- as is also the roof. The exterior finish is C select white pine and is given three coats plain white paint. The shingles are stained a medium moss green. The porch floors are cypress.

The interior finish in the vestibule, parlor, dining room, sewing room and bed room is plain red oak flooring, lined with Johnson's Wood dyes, fillers and flat finish. The floors are waxed.

The windows are equipped with Caldwell's sash balances, excepting the basement sash are hung on loose pin butts. The plastering is all two coat work of Climax wood mortar. The hardware trim is all wrought bronze, antique copper finish. Bath room fixtures and sinks are white porcelain lined. The
heating system is an Andrews hot water plant with a steel vertical boiler. The lighting system is an acetylene gas plant, Birch generator.

Special features and equipment which make this plan a good one for a farm residence.

1st—A large dining room.
2nd—Sewing room off the dining room.
3rd—Large kitchen with built-in sinks, cupboards, and dumb waiter.
4th—Men’s wash room with built-in mitten cupboard.
5th—Bath room off the family bed room.
6th—Bath room on the second floor for the hired help.
7th—Clothes chute.
8th—Six good sized bed rooms with closet for each, also a linen closet.
9th—Room in the attic for 5 or 6 beds.
10th—Balcony off the second floor for airing bedding, etc.
11th—Laundry in basement with complete modern equipment.

D. A. Haines,
Mabel, Minn.
HONORABLE MENTION DESIGNS

Building a Cobble Stone Chimney

METHOD USED IN NEW MEXICAN ADOBE BUNGALOW

Designed and Built by Mercer Lawing,
Carpenter and Builder, Tucumcari, N. M.

Editor American Carpenter and Builder:

I DESIRE to enter your Prize Competition as advertised in the American Carpenter and Builder, of which I am a reader and think it the greatest building paper published.

I am sending photographs and drawing of the floor plan of Mr. F. Caruthers’ bungalow, this town, of which I am architect and builder.

Being a carpenter, and as masonry is supposed to be out of my line, I hope to enter Class G, as I did the masonry on this building. This bungalow is built of adobe—No doubt many of the readers never saw an adobe building. It is pebbledashed. The chimney and piers are cobblestone.

At the time I built this house there wasn’t a mason in town that cared to undertake the masonry of this chimney, so I did the work myself, which is easy enough if you do as I did. For the chimney I built a form 2½ ft. high and the proper size. I build the flue of the chimney of brick laid in good lime and cement mortar. In every third course of brick I placed anchors made of wire, to extend out into the cobblestone work. After I built the brick work up

Very Artistic Adobe Bungalow of Four Rooms, Planned and Built by Mercer Lawing, at Tucumcari, N. M.
some 3 or 4 feet high I then set the form and lay the cobblestones in cement mortar mixed two parts clean sharp sand to one part Portland cement. The stones were laid against the form. After the work had time to set up hard enough to stand I took the form down and scratched the joints out with a small trowel.

I made three of these forms 2½ feet high, which enabled me to build 7½ feet at one time. I would let this set up and scratch the joints before I built any higher. This chimney is 23 feet high.

The brick mantle is built of red pressed brick, and is very nice; am sorry I cannot send a photograph of it. The porch piers are built in the same manner as the chimney, and are not so hard after you get the forms set.

The stone in this building I hauled twelve miles; as this is a prairie country, the stones are found in the creeks and rivers. This building is different from any other in this county, and the owners are entirely satisfied with it. The total cost is $1,056.00.

Hoping this will benefit some of the boys should they want to build a cobblestone chimney, I close with best wishes to the American Carpenter and Builder, Mercer Lawing, Tucumcari, New Mexico.

Modern Residence at So. Bend, Ind.

Structure Designed by Thos. L. Hickey and Built by L. A. Hickey's Sons, General Contractors and Builders, So. Bend, Ind.

Editor American Carpenter and Builder:

The exterior of this design shows a stucco finish over galvanized metal lath. The foundation to the first story sill line is of concrete finished with a water table effect. The structure is sheathed in the usual manner, is then wall-covered with a water-proof building paper, and on this are nailed furring strips ½ by 2 inches, 12 inches on
centers to which is well stapled the metal lath. This half inch air space precludes all moisture and affords a perfect clinch for the stucco.

The veranda has a 5 inch concrete slab, reinforced with expanded metal, which admits of the basement being continued the full length of the entire building.

The exterior finish is of rough sawed cypress, stained a warm brown, with the roof shingles a deep green, making a very striking exterior.

Entering the living-room, we have a very attractive apartment, with its fireplace and hearth of dark un-glazed brick laid up with a sunken joint, and the bookcases on either side, with the cozy window seat in close proximity.

Glancing through the panelled column opening we see the dining-room with its deep bay and open in casements.

The second floor is laid off with not an inch of waste room. We have one fine large chamber 23 by 14, with six windows and a roomy, well ventilated closet. Bath is very conveniently located to all rooms.

The living-room and dining-room are finished in weathered oak, the kitchen in southern pine, natural. The second story rooms in white enamel, with birch mahogany doors. Hot air heating plant. Size 24 by 32. Estimated cost $3,250.00 complete.

The mission table and reclining chair shown in the photograph of the living-room, were both made by myself from sketches which appeared in the American Carpenter and Builder. Most of the material consisted of leftovers from our jobs. The wood in the table represents about eight different jobs.

Both table and chair are mortised and tenoned and doweled, and put together in a first-class manner. I finished them by giving them a coat of wood dye, then a coat of paste wood filler, two coats shellac, sanded between coats, and waxed. This work was all done evenings. Thos. L. Hickey, General Contractor and Builder, South Bend, Ind.
HONORABLE MENTION DESIGNS

A Seven-Room Bungalow at Minden, Nebr.
FRONT OF BASEMENT USED AS BILLIARD ROOM
Designed and Built by Nels Olsan, Minden, Nebr.

Editor AMERICAN CARPENTER AND BUILDER:

THIS is a model seven-room bungalow designed and built by me at Minden Nebraska. The building is 28 feet wide by 36 feet long, including porches. On the first floor are four large rooms, living room, dining room, library and kitchen besides a vestibule.

The living room is 12 by 28 feet and has a fine staircase in the north side and a fireplace opposite, which is made of brown pressed brick laid in dark mortar. On each side of the fireplace is a well designed book case. From the living room into the dining room is an opening about six feet wide. The demi-partition is panelled with oak on both sides and supports two massive columns which meet the beams under the ceiling.

The dining room is panelled as high as the plate rail on all sides not taken with the leaded glass
closets for china and glassware opposite the colonnade. A built-in serving table is provided under the windows. The walls of both the living room and dining room are tinted a pale yellow.

The special feature of the library is a colonnade opening from it to the first landing of the staircase. The library is tinted in red. The living room, dining room, and library are finished in oak in the early English.

The kitchen is well provided with built-in cupboards, kitchen sinks, and drainboards well placed with regard to convenience.

On the second floor are three bed rooms and a bath room. The guest room, which is to the front, is tinted blue with white enameled woodwork. The south bed room is tinted gray with white enameled woodwork and the north room is pale yellow with a finishing of oak woodwork. Each room is fitted with a large closet, which is ventilated and lighted by a small window. The bath room is enameled white.

In the basement are billiard room, laundry room, furnace room, and vegetable cellar. The billiard room has a beam ceiling and an open stairway leads from it to the living room. A feature which makes the exterior especially attractive is the klinker brick used in the front porch balustrade and piers as well as the chimney. The material of the outside walls is three inch red cedar siding painted in a dark brown and trimmed in white.

**HONORABLE MENTION DESIGNS**

**Weil Planned Residence for $4,000**

SIX-ROOM, TWO-STORY, STUCCO HOUSE AT PLEASANTVILLE STATION, N. Y.

DESIGNED AND BUILT BY

Michael Mikkelsen

Builder and Contractor

ALL WORK HAS MY PERSONAL ATTENTION

PLEASANTVILLE STATION, N. Y.

Editor American Carpenter and Builder:

HERE is a photo, plan and statement of material and equipment, of the last house I have finished building and designed myself. I have been in business here six years. The house herewith enclosed is number twelve, of which I have built for myself, and I have built double that number for others. I design all my own houses, and also furnish plans for others. The houses are all built differently, but about same size, and sell for about $4,000, and rent for about $30.00 a month.

Foundation of this building is of local stone with a slapdash finish. Cellar floors are concrete. The building is balloon frame, sheathed with hemlock. Studding 2 by 4, floor timber 2 by 8, ceiling beams 2 by 4, rafters 2 by 4 covered with N. C. sheathing, black Neponset paper and Edwards Spanish metal tile. Outside is covered with galvanized metal lath and stucco, finish same as number two sandpaper, with white Atlas cement.

First floor is 1 by 6 inches N. C. pine with a 3/8 inch oak finish; second floor is number one flat grain. Partition between hall and dining room, and between hall and living room is only 5 feet 6 inches high; there is a girder over each partition, 8 by 12, cased in the same as beam ceiling in dining room. The plate shelf comes at same height as top of partition. There is a seat in the hall which does not show on the plans. The bath room has tile floor and imitated tile wall 4 feet high. The kitchen has sink, wash tub, range and hot water boiler. The ashes drop from the range to the cellar. The house is lighted by electricity and heated by steam. The inside trim is cypress and stained dark brown in main rooms down stairs and upper hall; balance of upper floor is painted white. Kitchen is finished in natural wood.

Michael Mikkelsen.

One of Several $4,000 Houses being Built by Michael Mikkelsen at Pleasantville Station, N. Y.
Woods Evolves a Master Key
THE PRINCIPLES OF RAFTER FRAMING BY MEANS OF THE STEEL SQUARE CLEARLY ELUCIDATED

JUST as we were casting about for something to say to the American Carpenter and Builder readers, the office boy handed us a memorandum from the Editor with a reminder that the April number would be the birthday number, or rather the eighth anniversary number and that it would be necessary to take cognizance of same and celebrate, as it were, by giving something appropriate for the occasion. But Oh! what a reminder; seems but yesterday since that first birthday. How the years have crowded in between then and now and are numbered with the past. They are gone, never to return and the only hope left in them, is that we may have said something that will last longer than eight years.

Eight is the number, so for the occasion we have selected a subject pertaining to eight and for this we have prepared twelve figures, one for each month, when another anniversary will be ushered in upon the readers; but this is the one that claims attention.

To begin with, we will start out on the square; twelve-inch square as shown in the first illustration. This is a simple illustration. Now let us see what we can do with it. If we draw a line diagonally through it, as shown in the second illustration, we find its length by extracting the square root of the number of squares contained in two sides to be 16.9705 inches. Now, this is so nearly 17 inches, it may be used for working purposes on the steel square, but it lacks identically the same amount as in the case of the diagonal of the square, as before mentioned. By drawing a line from the intersecting point on the diagonal to 4.9705+ we will have one-eighth part of an octagon with an inscribed radius of 12 inches.

Passing on the 4th illustration, we have the same as shown in the preceding illustration, with the addition of a line from 3 to 5, but as we said before, it is not 5. If it was, this line would be exactly 13 inches long, but the difference is so little that it is discarded.

We trust this fully explains why 12 and the rise of the roof for one foot run give the seat and plumb cuts of the octagon hip. There are other things we would like to mention, but cannot stop to enumerate them now,—save this one.

[Diagrams Explaining the Principles of the Steel Square]
The line from 12 to 5 represents the miter line and 12 and 5 will give it as shown in the 5th and 6th illustrations. In the first case, it shows the relation of the angle taken on the steel square to its inscribed diameter and the length of the side of the polygon. In the second case (6th illustration) it is made to reveal the miter in all of its simplicity. Now, if there is a single doubting Thomas in all of the readers of the American Carpenter and Builder, we want him to at least set up and take notice, while we demonstrate this fact.

Just suppose 4.97+ is a pivotal point and we take hold of the blade and swing it back until its edge rests parallel on the line from 12 to 4.97+ in the first instance and see how the 12 on the tongue is transferred to a point in a direct line with one of the sides and see how nicely the blade is lying over the miter.

The above pertains to level miters but should there be used for an incline to the sides; then it is another kind of a miter,—a hopper miter, and it may be obtained as shown in the 7th illustration. Suppose the incline is one-half pitch; then we lay off the 4.97+ on the pitch line as shown and the rise for this length taken on the blade, as at A, and 12 on the tongue will give the required angle for the octagon hopper miter, the blade giving the cut. For the cut across the face of the board, take 4.97+ (5) on the tongue and 16.97+ (17) and cut on the former.

Passing on to the 8th illustration, we show what determines the miter which is found by dividing the number of degrees in a half circle. Thus $180 \div 8 = 22\frac{1}{2}$, and this falls at 4.97+ on the blade. Another interesting thing about this is that each time that the degrees increase $22\frac{1}{2}$, the degree line will intersect a circle of any radius struck from the 90-degree line into one-eighth part, as shown at $22\frac{1}{2}$; 45; 67% and 90 degrees respectively.

Here is another interesting thing about the division of the circle, as shown in the 9th illustration. Here are shown the miter lines for the square and octagon. By squaring up from 6 to the square miter line, will give the center of a circle to catch the four corners of the square while the octagon miter line intersects the circle at the center of one of these parts, as shown;

Ah! here it is. We have it in the 12th and last illustration. Here is the climax of all that is contained in the eleven that precede it and more. We cannot take up more space to tell it all, but in brief here are shown the transformation of the angles that enter into the true octagon in all of its phases in frame work.

It contains the master key to unlock the problems that enter into frame work of any angle or pitch and he that possesses that key, if he should get in a seemingly close corner, can frame his way out and do it on the square.

Wood Floors on the Ground

It is difficult to get a satisfactory wood floor on the ground—almost impossible. After five years' use, the Aberthaw Construction Company of Boston have taken up a floor laid with plank driven into tar, with hard-wood above this, and the plank came out as powder. It is obvious that fermentation will set up wherever air is kept from timber that has any sap in it. The wood top is very nearly airproof. The tar is absolutely so. The result is, this disintegration of the plank will occur, as might be expected. For ground floors use either cement, asphalt, or tar concrete if possible.
As we were closing our talk yesterday," said the Boss, "one of you fellows asked me in regard to the stress conditions in the material at the side B in Fig. 15, which we used in Talk No. 8. Supposing that we look at this figure in the log book again. You remember that we saw that the values of \( p_1 \) and \( p_2 \) in Fig. 16 pointed in the same direction on the right-hand side of Fig. 16, and in opposite directions on the left-hand side, or on the side away from the load. Now, if we added \( p_1 \) and \( p_2 \) on the right-hand side, or on the loaded side, we would expect to subtract them on the side away from the load. That is just what should be done. In other words, if we wish to see what the internal stress is in the material on the side of the short column which is away from the load, we should place a subtraction sign in Formula No. 6 instead of an addition sign. Then this formula would read:

\[
C = \frac{W_2}{A} - \frac{W_2 \sigma c}{I} \quad \text{(Formula No. 6a)}.
\]

"If the value of \( \frac{W_2}{A} \) is greater than that of \( \frac{W_2 \sigma c}{I} \), you must be careful that the difference between the two values is not greater than a safe value for the tensile or pulling strength of the material which is used. In timber or steel, this condition is not likely to give trouble, but in the case of cast-iron columns, you should see that the value of \( \frac{W_2}{A} \) is not more than 2500 greater than \( \frac{W_2 \sigma c}{I} \).

"In the case of brick-work or stone-work, the value of \( \frac{W_2 \sigma c}{I} \) should never be greater than that of \( \frac{W_2}{A} \) for if it is it means that the tensile or pulling arrow in Fig. 16 is greater than the compressive or pushing arrow, and the tendency will be for the joints in the brickwork or stonework to open up near the top of the pier where the weight of the pier itself does not aid in holding the joints together.

"There may be cases where the position of the load to be carried with safety by a cast-iron column will be governed by the tensile strength of the material rather than the compressive strength, since the breaking tensile strength of cast-iron is only 20,000 pounds per square inch, while the breaking compressive strength is 80,000 pounds per square inch. If we were using Formula No. 6, for a factor of safety of 8 on the compression side, or on the side nearest the load, 80,000 we would use —— or 10,000 pounds per square inch, as shown by the table in Talk No. 7.

"I wish that you would use this hour," said one of the men, "in showing us just how this matter works out for cast-iron columns and brick work."

"Very well," ECCENTRICITY said the Boss, "as long as we started with brick work piers and understood that the mortar should not be subjected to pulling or tensile stresses at any place on the side of the pier which is away from the load, let us see what the conditions are on the side of the pier which is away from the load, and then find out how far towards the right-hand side of the pier the load could be carried without any tendency towards opening up of the joints in the upper part of the pier.

"Why not figure conditions down at the pier Fig. 15. Brick Pier with Eccentric Load Due to Weight on Floor Beams"
footing as we did on the compression side," asked one of the men?

"Because," said the Boss, "we do not have the weight of the brick work itself to help hold the top joints together, and we do have this additional weight at the bottom joints. Therefore, if we based our calculations on this added weight of pier, some of the joints at the top might open up when those at the bottom still would be safe. That is why I changed the [\(W/A\)] of Formula No. 6 to [\(W/a\)] when I wrote Formula No. 6a. You must remember that the weight of the pier itself in this case is always a central load and is distributed evenly over the whole bottom end of the pier. This will make the compressive conditions worse and the tensile conditions less at the base of the pier."

In order to investigate the stresses in the side of the pier of Talk No. 8 away from the line of action of the load, the Boss wrote Formula No. 6a as follows:

\[
C = \frac{12,000}{13 \times 13} - \frac{12,000 \times 2 \times 6\frac{1}{2}}{13 \times 13 \times 13 \times 13}
\]

"This shows," said the Boss, "that the farther side of the pier is in compression also, since [\(W/A\)] is larger than [\(W_a/A\)]."

"Now let us apply Formula No. 6a to the same problem, and work the problem with the object in view of finding out the greatest value a can have, as we just spoke of, without any joints opening up. This condition would be met if we put C in Formula No. 6a equal to zero, and after filling in all known values, solve for a."

The Boss then turned to the problem in the "log book" under Talk No. 8, and filled in Formula No. 6a as follows:

\[
0 = \frac{12,000}{13 \times 13} - \frac{12,000 \times a \times 6\frac{1}{2}}{13 \times 13 \times 13 \times 13}
\]

Then \(33a = 71\), or \(a = 2\frac{1}{3}\) inches (nearly).

"You see," said the Boss, "that if the loaded beam on the pier in Fig. 15 had been about 5/32 of an inch farther to the right, not only would the compressive stresses in the lime mortar been of too high a value, but also the tension side of the pier would have been in danger for any kind of mortar.

"It is a good rule to keep the line of action of the center of gravity of the load always within the middle third of the top of a pier of square or rectangular cross-section, and within the middle fourth of the top of a solid circular pier. Fig. 18 will show these locations."

"Now," said the Boss, "take a piece of cast-iron column which is 3 feet long, 6 inches outside diameter, and 3/4 inch thick. Since length divided by diameter is less than 10, apply Formulas No. 6 and 6a to this cast-iron member when used as a short pier with a load which is 1 inch off-center, and see what is the greatest load the material will carry with a factor of safety of 8. Fig. 19 shows the general condition."

"First, fill in Formula No. 6 and solve for \(W_a\), omitting the weight of the pipe in this preliminary calculation, thus making \(W_a\) and \(W_p\) the same. From the table in Talk No. 7, C will be \(C = \frac{80,000}{8} \) for the compression or near side, and taking values of \(A\), \(e\), and \(I\) from Talk No. 4, (Fig. 8, F.),

\[
80,000 = \frac{W_a}{8} + \frac{W_p e I}{80,000} \]

"Now fill in Formula No. 6a with this value of \(W_p\), and solve back for C to see if the stress on the near side is compression or tension. If the part is larger than \(W_a/A\), we do not need to investigate further, as all parts of the pier are under compression. Otherwise, we must see that is not greater than \(C = \frac{W_a}{A}\)."

"From this equation, we can easily tell by inspection that \(14/173\) is greater than \(60/866\), therefore the far side of the column will be in compression also, and we do not need to fear a tension failure. The unit compression on the side away from the load is not as large as that on the side near the load, as we have seen in the brick pier problem."
IT seems to me as though I cultivated rather nature has thrust upon me, a desire to write articles for the American Carpenter and Builder. The foregoing is all quite true, but does not sound like the ordinary language of a mill man (an old one) as the Editor calls me; however, that may be true, but I am still not eligible to membership in Dr. Osler’s class of Dips, as I arrived in America in 1872. Now that “Arrived in America” sounds as though I was an ex-emigrant, alien, or hottentot; but alas! I am merely a reinforced type of Jerseyman, i.e., a native of the State that furnishes the world’s market with Apple Jack and Mosquitoes.

A GIANT GLUE CLAMP. I saw an improvised clamp some time ago, that not only appealed to me, but to others in the factory; and the stunt was pulled off by a man whom the boys said did not have brains enough to last him over night. He was gluing up pieces of oak, 7/8 inches thick, 6 by 6 inches square. He applied the glue on the blocks and laid them on the floor with a paper underneath to keep the glue from running on the floor. He started from one concrete pillar or column and placed the blocks in a row in line with the next post, then he used an ordinary jack screw against the post and blocks. When he took up on the jack, it made the juice (glue) run like sweat off of the brow of a saloon man in July.

SOMETHING ABOUT EDGED TOOLS. Speaking about carpenters’ and cabinet makers’ edge tools; I know personally that a chisel, gauge, or plane bit will get so that it will not work well. I have discussed and cursed this freekish thing more than once, but later have learned that all finely tempered edge tools, even a razor, will do the same thing. The reason is this—the steel gets tired, and if it is laid aside for a week or more and tried again, it will be found to be as sharp as ever. Now, this may sound fishy to some of the more skeptical readers, but I believe it—and that is sufficient proof for me.

A COMMON MISTAKE. I have made and seen made by other mechanics this unpardonable mistake, in making a level measurement with a straight edge and level. The mistake comes in when Mr. Measurer takes his dimension from the top of the straight edge, instead of the bottom. This may look like a fools trick; but it has been done by thousands of men and will be pulled off as many more times. So much for Mr. Blunder.

A TRICK BETWEEN BROTHERS. Working in a mill some years ago as a turner, my brother who is a cracker-jack sash and blind maker, worked on the second floor directly over me. He had the habit of pouring water through a hole in the floor down on me; finally I turned a plug, put some glue on it, stopped up the hole. That did the trick all right for a few days. One noon, I was sitting on the lathe eating my hay, when I heard a boring noise over my head. Brother was making another hole. He evidently got up on the lathe and when the one inch bit came through the floor, I commenced operations with the hammer. He evidently could not get the bit up through the floor again, because I had beat it up like a fish hook as I was certainly doing some hammering. He released the bit from his brace and let go of it. I pulled the bit through and went up stairs; the following conversation took place:

“Say Kid, that trick cost you a new bit that time.”
He said, "No it didn't because I took it out of your chest this morning."

**SPEAKING ABOUT WOOD CARVING.** Some years ago I had occasion to make a picture frame; the order was an odd frame something out of the ordinary. I used mahogany 7/8 inch thick by 2 1/2 inches wide, size of glass 24 by 36 inches. Here is the way I did it; I have never seen one since. Lay out a scroll on the face of each piece, keeping 1/4 inch away from the edge, where a bead was to be worked on later. Line out the carving design with a parting tool, V or small gauge U, then take a prick punch, such as carvers use and punch the background down as far as the wood will permit without breaking it. When this is done, take a plane and plane down the design to the level of the now punched background. Then put the four pieces in water, face down; leave them a couple of days and when taken out the punched or pricked background has swollen out past the smooth scroll design. Then let this dry, work a bead on each edge of the frame, miter together and the thing is done.

**THE MISTAKES OF A MECHANIC.** Mechanics getting out of mistakes is one of the most pitiful sights on a job; the expression on his face when he first discovers a large juicy mistake is enough to make a dog strike his mother. And believe me, if the foreman is not at hand, Mr. Mistakist will get out another lot of stuff in about one-fifth of the time, and make a dog strike his mother. Sweat drops as large as a New England doughnut. Although I have heard it said that a man who will make a mistake and gracefully get out of it, is smarter than the man who does not make them (a scarce specimen), because he does the double shuffle in producing twice, one bad and one good. Then again, the fellow who does not make mistakes is the one who gads around the shop and never takes any chances. Some bosses will make a noise like the bursting of a Paris sewer when they discover a mistake; others will immediately start off to rectify it, because there is no use bemoaning over the cow juice that has been unfortunately disorganized. While all the worn fabric masticating is being done, that time could be put in on the new job. "To error is but human; to repeat it becomes force of habit."—Shakespeare.

Now then, as to making mistakes on wood working jobs, it makes a big difference who makes them. I have seen foremen give orders that would cost a contractor many dollars and would make a noise at some poor jerk later that might happen to make a miss-cut, that would vibrate the rafters of the Pacific Ocean's roof,—and that's some roof. I once knew a cabinet maker who was making a long elaborate counter and was given a man to help him. No. 1 was jealous of the man given him, and during the day discovered the counter 7 inches too short. He went to the shop at 6:30 next morning and changed the layout rod, so that his helper would go wrong, but a sash man who was in the shop early that morning, saw the quick change act, and later told Mr. Helper. Well, say,—the noise sounded like a Big Four passenger engine running amuck through a 5 and 10-cent store.

I have seen some very fancy mistakes made, and have, myself, made some very cute ones; in fact, I think I have gone all the way through the Book of Errors and now have a relapse.

**Some Stair Construction**

I recently measured up a job of stairs where a long flight landed down on a half space platform. Instead of the rough horses cutting against the header of the rough platform, which was five risers high, Mr. Foreman Carpenter, let them run down to the first floor, then put a piece of 2 by 4 inches from there to the outside wall. He nailed the rough horses to the first floor,—the rough platform, to the studs under rough horses and to the second floor header; this was to help stiffen the stair and help hold up the center of the joist on second floor. I think this a good stunt; here is an illustration.

**CHEAP TOOLS.** I have seen wood turners with chisels and gauges made of files, the temper drawn, ground and shaped properly, then retempered to edge temper. These were cheap and good, because I have used them. This is a hint for apprentices.
SOMETHING seems to have come between Jimmie and me and I’m worried about him. I’m afraid he’s speculating. He is making preparations to erect a building on a lot near ours, and won’t tell me for whom. Every time I approach the subject he asks some foolish question about that alarm clock. I didn’t think Jimmie was so picayunish. The man who used to own the lot, however, tells me that he sold it to Jimmie, and there is no record of another transfer. I don’t at all like the idea of Jimmie building speculatively—especially without consulting me—but am somewhat consoled by the interest which Lorna seems to be taking in architecture. She seems to be studying it quite diligently, under Jimmie’s tuition. Harriet would never allow her to work steadily in the shop with me, though she wields a rolling pin of her own turning; but I think that we can compromise very nicely if the child inclines to become an architect.

Good Stuff for Cutting Bridging

Speaking of Jimmie’s picayunishness, he is showing a spirit of economy in some things which pleases me very much. I noticed a few days ago that he had hauled to the shop a lot of the short pieces of joists and timbers such as collect around any building job—and are usually used for fire wood. These he ripped into 2 by 2’s, approximately, and cut to such various lengths and bevels as are most apt to be required for bridging between floor joists. He thus not only saved quite a bit of lumber but made quite a saving in the cost of cutting. His machine hasn’t a swinging cutoff gage, so he got the desired bevel by screwing a wedge-shaped block to the front of the square one he has.

Because of the lack of proper length gage he was handling each piece twice, first cutting off one end of all then putting on a stop and cutting the other; so I showed him how to make the sort of gage we used to use forty years ago. Fastening his beveled block to the gage with the straight grained edge to the front we made a mark on it, as at A in figure 1, at a distance from the saw equal to the length he wanted. We then took it off, bored a small hole at B and, with a key-hole saw, made a cut from B to A, parallel with the edge about a quarter of an inch from it. We then inserted a small wedge at C, planed off the bulge thus made, and drove a couple of small brads to hold the wedge in place. Sawing square in at A now allowed the sliver, D, which sprung outward sufficiently so that its end might form the desired stop against which to rest the end of the stock to be cut to length. When cutting the first end the other was allowed to run by and it took but slight pressure to force the stop back; yet it was out and ready for service instantly when the piece was lifted to be turned around. Cutting only a few pieces saved as much time as it had taken to make the device; and, when this job was done, Jimmie bored a hole in it and hung it up for possible future use.

Sawing Gutters from the Solid

Jimmie called last night, as usual; and, as Lorna was entertaining a very bright young lawyer whom she recently met, he and I had a long chat together. It seemed quite like old times except for a degree of constraint and reserve not at all like the old time Jimmie. There’s certainly something wrong with the boy. Our talk was mainly about the most practical way of making eaves troughs, or gutters, for cheap work.

“T find it almost impossible,” said he, “to nail up a trough of boards so that it will remain reasonably tight; and I have been wondering if I couldn’t saw something out of the solid that would be about as cheap and a good deal better.

“‘You sure can,’” said I, “get them out even more cheaply and much better. I used to make a good many out of four by fours. It is merely a matter of surfacing, or sawing, them to size, then cutting out the corner like this”—and I made the sketch which is reproduced here as figure 2.
"Your four by four and the work will not cost as much as the lumber and work in a well made board trough, while you will have a much more durable job, and will have a piece of three by three left. It is true that three by three is not a commercial size, but one can always get some value out of it. You can do the job readily on your buzz saw, without any special jigs or adjustments, and there is nothing about the job which you do not already know; unless, possibly, it is a little trick in selecting the stock.

Cut Each Piece Right Considering the Grain and it Won't Warp

"You of course know that the more nearly straight-grained and sound your stick is the better it will stay in place; but there is another point about the grain which is much more likely to be overlooked and which is nearly, if not quite, as important. You know from the experiments which your father and I tried some years ago that wood shrinks and swells a great deal more in the direction of the circumference of the tree than in that of its diameter. This, and the fact that the grain is always more or less curved, accounts for most of the warping and twisting which is the chief bugbear of wood workers; and, in order to secure the greatest possible degree of stability we must so select our piece of wood that the grain will run as nearly as possible at right angles with its width.

In selecting a piece of four by four for a V-shaped trough I should choose one with the grain running in the relative direction indicated by these broken curved lines in figure 3; and would cut the trough as indicated by the heavy lines. If cut from the left and upper sides it would be nearly as stable, but not quite. You see that, either way, you will get the two sides practically "quarter sawed" or with "edge grain." A trough selected and cut in this way will shrink and swell comparatively little, will not warp materially, and will be very unlikely to check; for such change of volume as there may be will be comparatively uniform. If you cut one from a piece as shown in figure 2, the side on the left, the one with the "flat grain" would shrink and swell much more than the other, would warp outward, and eventually crack.

"Yes," said Jimmie, "I see."

He did seem absorbed in thought, but it somehow didn't appear like wood working thought. What can have gotten into the boy?

"I've thought of the four by four scheme," said he after meditating a while, "but it seems rather wasteful of lumber. Of course one can work up the three by three somehow, but it is only rarely that you can get full value out of it. Isn't there some way to get out practically the same thing with less waste?"

"Yes. You can get three troughs about three-quarters of an inch thick, and only a trifle smaller, out of a four by six (three times the product out of fifty per cent more lumber) or get them with even less comparative waste from a wide four-inch plank; but that would require a special jig.

"Well, let's have the jig then."

Now right here happened a curious thing which, though it relates more to psycho-physics than to wood work, seems worthy of note. Lorna, who had been playing something low and soft on the piano, immediately struck up something loud and quick. I don't know the names of such things, but it sounded like a buzz saw out of balance and a power mortiser with a hot box. Jimmie immediately seemed to brace up and take more notice of what I was saying; but whether it was the resemblance of the music to the sound of wood working machinery, or whether purely the effect of the music itself, is a matter for psychologists to determine.

A Jig for Sawing V Troughs

"If I wanted to get V-shaped troughs out of four by six," I continued as Jimmie's eyes took to them-
selves some of their old time snap, "I would cut them as shown in this sketch, figure 4. To do this you will have to use a saw which will cut four inches above the table, and some arrangement which will tilt your plank, or four by six, at an angle of 45 degrees with the table. If you have this device on only one side of the saw—and the same if you use a tilting table—you will have to turn your stock end for end after each cut. For this reason it is better to have the tilted rest on both sides, which will void the necessity of swinging the plank around and make it necessary only to turn it over. I would build something similar to this of which I will show you an end view (figure 5).

"The two guide pieces, B, B, are supported on either side of the saw by the blocks, A, A. It will require two of the blocks for each guide, though of course only one shows in the end view. The inner, vertical, edges of the guides must be as far from the saw as the desired thickness of the gutter; and must be high enough so that the corner of the stock after the second cut, will barely touch the saw table. This height, by the way, will be just twice the thickness, as you will see by reference to the diagram.

"The position of the stock during the first cut is shown by the solid lines. The second cut, removing the first triangular piece, is made by turning the stock over and running it on the other side. The third cut is made in the position shown by the dotted lines; while the fourth one, removing the first finished trough, is made on the same side as the first. After this a trough is removed at every alternate cut until the stock is used up."

"But how about selecting the stock for this job—I suppose that the way the grain runs makes just as much difference as when the other method is used?"

"Sure. I would try to get a plank with the grain running, as nearly as possible, as indicated in figure 4. One cut directly through the middle of the log would be ideal."

We were interrupted here by the young lawyer taking his leave; and I had barely time to tell Jimmie I'd be down tomorrow to help him, when he went too.

"What in the world is the matter with Jimmie?" I asked.

"There isn't anything the matter with him," said Lorna. The child appeared fretful and flushed, so I suggested to Harriet that she give her some whiskey and quinine; but she simply looked wisely contemptuous, as is a woman's way, and asked me if I had locked the back door. So I locked the back door—and kicked it too—and went to bed.

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**Slate Roofs—Ideas Both Old and New**

**By C. R. Lippmann**

In no other line of building material is there such a variety offered to the builder as in the matter of roofings. On considering the various kinds, a set of roofing standards will be found a valuable "yard stick of merit."

Let us gauge slate in this manner. A witty philosopher said that in getting an automobile or a wife, it is not the first cost that counts, but the upkeep.

Same way in roofs. The cost of the roof is not only the outlay required to put it on the building, but the total expense of keeping the building under roof as long as the structure stands; for the roof is the one part of the house that must be kept intact.

Naturally that roofing is the cheapest, which lasts the longest without painting or coating, provided of course that the first cost is not prohibitive or excessive. Under such a cost test, slate shows up very favorably. Being non-metallic it does not rust and requires no painting. Being non-porous, it does not absorb anything; cannot decay. Being a homogeneous sheet of stone, it does not peel off in layers.

Which explains why in Europe, where the slate industry is older than in America, slate roofs are found centuries old. In this country there are slate roofs in good condition today that were put on when the Indians were still swarming through the valleys of the East.

Being stone, and therefore, non-combustible, a slate roof will turn even a frame house into a semi-stone structure so far as fire danger is concerned. Sparks glancing against the frame walls do no damage, because they slide off immediately. The fire danger is on the roof where the sparks lodge, unless it is covered with a fire-resisting material such as slate.
The desirability of slate having been established, next comes the matter of cost. Slate is mined along the Blue Ridge Mountains in Pennsylvania, Virginia, Maryland, also in Vermont, and New York. By far the bulk of the output comes from these regions. Naturally the cost of slate varies in different parts of the country according to the freight rate.

As a general principle it may be said that since the advance in the price of lumber and shingles, a slate roof can be put on for about the same as, or a little more, than a first class shingle roof.

There is a further similarity between the two; slate is laid about the same way as shingles. Any one who can put on the latter, can lay slate. But it requires less slate per square of roofing surface than shingles —therefore less time and labor.

Rafters or sheathing boards for a slate roof are put on in the same manner as for a shingle roof. The better the roof sheathing, the better looking will be the slate roof. For the best class of work sheathing boards should be tongued and grooved, and covered with sheathing paper.

Slating is started at the eaves, working upward, and laid with a 3-inch lap. That is, the top slate of the third course above, will overlap by 3 inches the slate of the first course below, as shown by the accompanying sketch. For this reason the eave course is only a little longer than half the length of the slate put on the rest of the roof. This is frequently accomplished by laying the slate in the eave course lengthwise. The lower end of this eave course slate should extend about one and a half inches or so beyond the eaves, and the course of slate should end flush with this edge, thus producing a double layer.

In this manner there is a double layer of slate all over the roof, and a threefold layer near and over the horizontal joints. As to vertical joints, the rows always break bonds.

A good practice is to trace out with a carpenter’s pencil or chalk the lines along the roof surface where the various courses are to be nailed to the rafters or the sheathing, as shown by the accompanying diagram.

In order to allow the second course, the one above the eave course, and naturally all the following courses to lie right, it is well to nail a cant strip along the eave before starting to slate.

Each slate is fastened with two nails; the holes therefor being punched by the roofer on the premises or else at the quarry. The holes are naturally so located as to allow for the 3-inch lap, no matter what the size of the slate, and placed about 1 inch from the side edges.

The nails should not be driven perfectly tight; this is so as not to interfere with the elasticity of the slate roof. Owing to its many small component pieces, it adapts itself readily to the vibrations of the wind, the sagging of the building, etc.

Of course the nail must not be allowed to project above the surface of the slate; in which case it would damage the overlying slate. Galvanized or copper nails are preferable owing to their weather resistance.

As the courses of slate approach the ridge, a slight variation in lap is permissible so as to finish at the ridge without cresting.

The ridges and valleys of a slate roof are generally of metal. Flashings should extend well in under the slate to keep out the possible “backflow” of water from heavy rains.

Slate comes in various colors, generally classified under the trade terms, Black, Sea Green, Hottled, Unfading Green, Unfading Red. The latter two are mined in rather limited quantities and naturally the highest in price.

Where it is desired to produce a fancy effect, sometimes green or red slate or both, are used in black slate roofs to produce more or less geometrical patterns. Ornamental effects are also produced with slate of the same color by trimming the exposed corners, either in every layer, or in layers at certain intervals.

One of the most popular styles of this ornamentation is to cut off the lower corners so that the exposed
part of the slate will form the lower part of a hexagon (an "equal-sided" six-cornered surface). This is called "cut Washington."

However, as we are more and more coming to the advanced view that simplicity is beauty, "fancy slating" is becoming a thing of the past.

Slate is also used as a top layer on flat roofs, where it is embedded in plastic cement—and of course laid without lap. Such a roof is in principle the same as a gravel roof, except that unlike the latter, the flat slate roof is permanent—since there is no gravel that can wash out or come out, leaving the underpart thus unprotected.

The slate used for this purpose is the same exactly as slate used for peaked roofs; no increase in thickness being necessary even when there is considerable walking done on the roof. The average thickness of roofing slate is 1/5 inch.

Old shingle roofs are frequently re-slated without removing the shingles—quite a saving in the cost of the job. Of course this is not possible where shingles are too curled or too rotted. The accompanying photograph shows such a job in process.

Slating requires few and simple tools. The slater's hammer is a combination tool, a hammer at one end, a pick at the other for punching holes in the slate, and a sharp edge between the sharp point and the center. At the latter is also a claw for pulling nails. In punching or trimming slate while roofing, the "stake" is used. This is practically a straight edge, having at its center a short, pointed leg. The latter is thrust into the sheathing boards, and thus easily moved from place to place as the roofer progresses.

The ripper is a long tool whose peculiarly shaped point is well shown by the illustration. This tool is slipped in under the overlying slate to "rip" out the nails of the under-slate in repair work.

A foot-power slate punching machine will punch the nail holes and at the same time trim the corners. These machines are easily portable and frequently carried around to the various building premises by the slater.

**Ultra-Modern Slate Users Reverting to Mediaeval Styles**

Illustrations by Courtesy of E. J. Johnson

Several of the architects in New York, among them the well known firm of Cram, Goodhue & Ferguson, are bringing out some new ideas in slate roofing. One of these methods has been brought about in a desire to follow old time European methods and to emphasize the "ancient and antique," which is so much a part of modern life. When slate quarries were first known in Europe, the slater would go to the quarry and take away as much slate as he could handle, in all sizes and shapes, just as it was quarried. He put it on the roof without much change and consequently there are in Europe, even today, on some of the older buildings, slate roofs of odd and uneven design.

The ultra-modern slate roof therefore follows old European methods. This consists of slates of graduated lengths and thicknesses and random widths. No attempt at uniformity is made in the width of the slate; all colors can be used, at the option of the owner. On a large roof, the bottom slate may be 11/2 inches thick and 3 feet long. For the next course slate slightly thinner and shorter is used, until the slate at the top does not measure more than 12 to 14 inches in length. Colors in mottled purple and green are used to produce artistic effects and the bottoms of the slate, as well as the sides are broken and left in the rough.

A slate roof of this kind is necessarily heavy and is designed for large residences, public buildings, churches, etc. This method was used for Howard Gould's new residence at Sands Point, L. I., and the total weight of the slate roof on Mr. Gould's house alone is 330 tons.

The illustrations show a straight roof laid with this method and a new treatment for valleys. The ordinary valley is of tin and the tin always shows. That entire valleys can be made of slate is shown by the photograph and the work so done is surely more artistic than an unsightly piece of tin. This method of all-slate valley construction is now being used by many of the best architects. Such work of course requires considerable extra time and care.
Plans for an Eight Room Brick House

FULL SET OF ARCHITECT'S WORKING PLANS TOGETHER WITH PERSPECTIVE DRAWINGS SHOWING A VERY NEAT AND COMPACT MODERN HOME

The house illustrated below, for which plans are given in the pages following, is a practical example of how such a building may be put up, utilizing every bit of space to good advantage, at the same time giving many modern touches not usually found in a building of this size or type.

As can be seen from a glance at the plans, two means of entrance are provided; either through the side door directly into the vestibule and reception hall or from the front porch through the French doors into the spacious living room. Besides the living room and reception hall the first floor contains dining room, kitchen, a large pantry and a screened breakfast porch. At the rear of the hall there is a nook and lavatory—a most convenient arrangement. Upstairs there are four large bedrooms with roomy closets. There is a good-sized bath room, easily accessible from any of the bedrooms. The screened sleeping porch at the rear is also an excellent feature of this arrangement. The third or attic floor contains space that can, with a little ingenuity, be converted into a cozy bedroom or a billiard room.

A building of this kind proves a model for the man of moderate means, and is well worth serious consideration.

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COMPLETE WORKING DRAWINGS FOR THIS HOUSE ARE PRESENTED ON THE 7 PAGES FOLLOWING
ROOF PLAN—HOUSE ON PAGE 67
Note that Dormer was Changed to Opposite Side When House was Built
FOUNDATION AND BASEMENT PLAN

(House Shown on Page 67)
Details of Interior Finish

(House Shown on Page 67)

- Elevation of End of Living Room -
  - Showing Fireplace and Continuous Trim -
Our New Home

We believe that every subscriber, advertiser and customer of the RADFORD PUBLICATIONS will be interested to know that we have purchased a home of our own.

On page 77 we print a half-tone engraving of a photograph of our new building. We have had our eye on this magnificent property for a long time. On March 20, 1913, we bought it after negotiations extending over a period of nearly three years.

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On page 82 we tell our subscribers of a Special "House-Warming Subscription" Offer. We respectfully urge them to read this offer and to tell their friends about it and to invite them to join our "Big Family."

Yours very truly,

[Signature]

President and Editor in Chief of the Radford Publications.
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Our Own New Home

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American Carpenter and Builder—Cement World—Dealer’s Record—Radford Architectural Co.

1827-1829-1831-1833 PRAIRIE AVE., CHICAGO
The portraits on this and the opposite page will give our readers and customers an idea of the immense staff of the Radford Publications. In this face-to-face glimpse an informal introduction is afforded of men whose names are familiar to the Building Industry in every section of America. These men are ready to help our customers at any and all times with practical, reliable information and to give advice that can be safely followed in all lines of work of building construction.
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About ten years ago the Radford Architectural Company, the first of the associated companies of the Radford Publications, was organized and began a business of selling plans and specifications by mail to contractors and builders. This pioneer concern started in a small way in the lower portion of a building in West Twenty-second street, Chicago. A view of our first offices is shown here-with. In less than two years the business had grown so rapidly that larger quarters had to be obtained, and one floor at 198 Fifth avenue was leased on Jan. 1, 1906, containing about 4,000 square feet of floor space. On April 15, the publication of the American Carpenter and Builder was begun at that address. The addition of this company and the aggressive methods employed to bring it to the front at the very start soon made it necessary to have additional room, and the fifth floor of 198 Fifth avenue was secured. Even this additional space proved inadequate in a very short time, and on Jan. 1, 1907, the entire eleventh and twelfths floors of the Medinah Building, one of Chicago's modern, fire-proof office buildings, were leased and occupied, giving the Radford Architectural Co. and the American Carpenter and Builder a working office containing about 11,000 square feet.

The first number of the American Carpenter and Builder was published on April 16, 1905, just eight years ago. Its first edition went to 16,000 subscribers, each of whom had paid for it for one year in advance. This was the largest circulation ever enjoyed by any building publication up to that time. It was a remarkable achievement for a brand-new paper entering a field already occupied by a number of publications, some of which had been established for over a quarter of a century. The first number of the American Carpenter and Builder consisted of 64 pages and contained the advertising of 28 firms occupying seven pages. Eighteen of these pioneer advertisers are still advertising with us. Contrast our first number with this one—our Eighth Anniversary Number—of nearly 200 pages, and 110 pages of advertising, representing 335 responsible concerns.

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…Continued on page 191

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[April]
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By Cecil F. Herington

WHEN the Old Builder got to talking on his most successful furnace heating that he ever put in, there was considerable attention accorded to him, for it was a subject pregnant with many pointers.

"Now, the other evening," began the Old Builder, "you will remember I spoke of the cold air box, and you may be surprised to know that this is one of the most important items on the furnace; for this reason—a box that is too big will cause an over-dose of cool air which will be more than the furnace can properly handle and a box too small will cause overheating at the furnace because the cold air is not supplied fast enough to carry off the heat. So in laying out my furnace system I started in at the beginning or the cold air box. Now, here is a little note to put down and always remember—make the cold air box of a proper size. If the cold air box is too big, it will cause an over-dose of cool air which will be more than the furnace can properly handle; and if the cold air box is too small, it will cause overheating at the furnace because the cold air is not supplied fast enough to carry off the heat. So in laying out my furnace system I started in at the beginning or the cold air box. Now, here is a little note to put down and always remember—make the cold air box of a proper size.

This box may be built of wood, although galvanized iron is better and in some localities you have to use metal of some sort. And no matter to what window you run, it is bound some time or other to be on the wrong side of the house when the wind blows opposite to its usual direction. There is only one way to overcome this; which is by running your cold air box to two outlets on opposite sides of the house with a flap valve in each branch.

This flap valve I made by tacking a piece of wire mesh across the box with a piece of canvas nailed only at the top located just back of the wire mesh. When the wind blew in one outlet it passed through the wire mesh and forced back the canvas flap so as to pass in under its raised edge. Now the flap valve in the other inlet is set with the wire mesh nearest the second inlet so that any air coming into the box through the first inlet and flap will pass on towards the second inlet, but striking the canvas flap first on the second inlet it is forced back from the inside tightly against the mesh, making it impossible for a single bit of air to get through. With a rig like this you get a good air supply regardless of the wind; and in this house I am speaking of they always did.

"And now there is only one thing more in regard to these boxes; there should always be re-circulation connection so that an air supply can be taken from some desirable point in the house and re-circulated through the furnace in times of sand storms or excessive dust.

"Having effectively disposed of the cold air box and set the furnace so as to favor the registers on the normally windy side of the house I did not forget to try and arrange the chimney to land somewhere near the furnace location in the cellar. A long horizontal smoke pipe on a furnace is a sure means of cutting down the draft and therefore the effectiveness of your furnace, meaning either more money for one of larger size or the installation of an inadequate apparatus. Even when these smoke pipes are cleaned yearly (which is seldom done) the deposit of soot in the lower half of the pipe becomes quite heavy and reduces the smoke pipe area accordingly.

Method Advocated by the Old Builder to Prevent Reverse Currents in the Cold Air Box, also a Re-circulation Inlet for Use During Dust or Sand Storms, and the Furnace set so as to Favor the Registers on the Windy Side.
quantities of lumber. The unit of heat measurement is what is known as the British Thermal Unit by rightful title (but I always call them simply heat units) and is actually about the amount of heat required to raise one pound of water one degree Fahrenheit.

"Of course no one knows just what the heat loss from any house will be; but it can be approximated by losses on buildings of similar construction under nearly similar conditions, and it has been found that the frame houses lose about 21 heat units per square foot of surface when the inside temperature is 70 degrees and the outside temperature zero; which is the usual basis of heat calculation. This is also assuming the exposed wall faces south—if it faces north it loses about 28 heat units per hour, if facing east about 23 heat units and west 25 heat units. A house exposed on all four sides takes the average heat more rapidly (about 28 heat units per hour), if these four or about 24 heat units.

"This does not include the windows which should be figured separately at 93 heat units for Southern exposure, 123 for Northern exposure, 104 for Eastern exposure and 112 for Western, or an average of 108 for windows all around a structure. This only applies to 'very good construction' and 'fair buildings' should have the losses increased 10 per cent and 'poorly built structures' 20 per cent, while all buildings with cold attics above add 10 per cent and cold cellars below another 10 per cent.

"To figure out the heat loss on the house I am speaking of it is necessary to know that it is 30 by 25 feet with two stories of 10 feet height between floor lines, twenty windows 2 feet 6 inches by 5 feet and a cold attic above but warm cellar with the furnace in it and, with due modesty on my part, say medium construction.

"Then the perimeter about the building is (25 plus 30) times 2 or 110 lineal feet and two stories at 10 feet each, give a height of 20 feet, so that the total wall surface is about 110 X 20 or 2,200 square feet. Then if there are twenty windows each 2 feet 6 inches by 5 feet, the window area in square feet is 20 X 2.6 X 5 equals 250. This subtracted from the total wall area is 2,200 minus 250 or 1,950 square feet actual wall surface and 250 square feet window surface.

"For total exposure the wall loss will be 24 heat units per square foot per hour or 1,950 X 24 equals 46,800 wall loss and 108 heat unit loss for the windows per square foot gives 250 X 108 equals 27,000 window loss. Then the sum of the two is 46,800 plus 27,000 equals 73,800 heat units. For a cold attic above 10 per cent is added, or is 7,400 heat units. For only medium good construction 10 per cent more, or is 7,400 heat units. Making a total loss per hour of...88,600 heat units.

"This gives us something definite on which to base the calculations as to the size of furnace. It has been proven by experience that it is good practice to heat the air up to about 120 degrees Fahr. and on this basis when running in zero weather the heat supplied to each cubic foot of incoming air may be considered in two parts—first, the amount required to raise the air to the temperature of the room (70 degrees) and second, the additional amount required to raise the air to 120 degrees. As it takes one heat unit to raise about 50 cubic feet of air one degree it takes 120 heat units to raise 50 cubic feet 120 degrees, which is equivalent to saying 1 cubic foot will require 1/50 of 120 units or 2.4 heat units.

"This 2.4 units per cubic foot is divided into the 70/120 required to raise the air to 70 degrees and which does not assist to heat, and 50/120 to raise the air from 70 degrees to 120 degrees, which is available for heating. Then for every cubic foot of air entering at 120 degrees we have 50/120 of 2.4 heat units, or about one heat unit available to supply the loss of heat which you just figured out.

"So the total loss (88,600 heat units) divided by 1 heat unit will give you the number of cubic feet of air required per hour at 120 degrees to keep the temperature at 70 degrees.

"As each cubic foot required 2.4 heat units to raise it from zero to 120 degrees, you have a total furnace capacity required of 88,600 X 2.4 or 212,640 heat units.

"Of course, there are furnaces and furnaces, but tests show that most good average types will transmit about 8,000 heat units for each pound of coal they consume so that to furnish the total of 212,640 heat units we require, it is necessary to burn 212,640 divided by 8,000 or 26 pounds of coal required per hour to keep up heat under the worst conditions.

"So far I have obtained the estimated heat loss on structure, the number of cubic feet of air at 120 degrees to offset this heat loss and to maintain an inside temperature of 70 degrees, and the maximum number of pounds of coal to be burned to heat this air supply to 120 degrees. These successive steps were all necessary, to get down to the size of the furnace, so now if we find out how many pounds of coal per hour we can burn on a square foot of furnace grate it's only a matter of division to get the required grate area.

"Careful trials by people of reliability have demonstrated that with hard coal you can't burn much beyond 5 pounds per hour per square foot of grate unless you force the fire more than you should. If I take this as a maximum figure (although I know some furnace men who figure as low as 3 pounds in order to be amply safe) I find that the furnace grate area must be 26 divided by 5 or 5.2 square feet, and as most furnaces have circular fire pots and grates I keep a little table to help me out, and here it is:

<table>
<thead>
<tr>
<th></th>
<th></th>
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<tbody>
<tr>
<td>18</td>
<td>1.77</td>
</tr>
<tr>
<td>20</td>
<td>2.04</td>
</tr>
<tr>
<td>24</td>
<td>2.44</td>
</tr>
<tr>
<td>26</td>
<td>2.84</td>
</tr>
<tr>
<td>30</td>
<td>3.24</td>
</tr>
<tr>
<td>32</td>
<td>3.64</td>
</tr>
</tbody>
</table>

"From this list I saw that I needed either a 30-inch or 32-inch diameter fire pot. As I used 5 pounds of coal per hour I was conservative and took the larger size."

HEATING QUESTIONS ASKED AND ANSWERED

Builder Herington Has Had Wide Experience with All Types of Heating. He Will Gladly Answer All Questions. Tell Us YOUR Heating Troubles. — Editor.

Two Heating Questions

To the Editor: New York City.

Being a subscriber of the AMERICAN CARPENTER AND BUILDER, I shall certainly take advantage of your kind offer...
to answer all questions appertaining to heating.

One—Briefly, what is the best method of arriving at an approximate cost of the different kinds of heating—hot air, steam, and hot water?

Two—What per cent of the entire cost of the house does heating usually consume? A. B. Greenberg

Answer: In regard to the first question we might say that the best way to estimate the cost of heating is to lay the heating system out completely on paper and figure up the amount of material from such a layout, allowing a certain percentage of the material for the labor lost. In fact, figure it the same as any other estimate from the actual requirements necessary for individual jobs.

Concerning question (2) the correspondent can readily see that a house built in New York City under the New York Building Code is going to cost considerably more than a house of the same size and arrangement built in the country. Also the same heating equipment at the same cost will heat either the most moderate priced house with common wood floors, soft wood trim, and other equipment of the cheaper grade or a house with parquet floors, tiled bathroom walls, oak trim and porcelain bath fixtures.

Therefore, the relation between the cost of construction and the cost of heating is at best a variable one.

From various sources figures on the cost of heating run as low as 3 per cent for plain steam in a large building up to 7 1/2 per cent in a church supplying warmed air for ventilation purposes with the hot blast system.

The correspondent would probably be interested to know that the cost on a two-family house steam heating system—the house being of distinctly the better class and built within New York City limits—was $500.00. Stated in percentage of the total cost ($8,000.00) this is 6 1/4 per cent. This house could have been constructed using the cheaper grade of materials and eliminating the extras for about $7,000.00, in which case the percentage would have been 7 1/7 per cent.

This house has a cubic capacity of about 50,000 cubic feet, so that the heating cost is close to 1 per cent per cubic foot. As nearly as could be ascertained furnace heating would have cost about 75 to 80 per cent of steam, and hot water or vapor about 20 per cent more than steam. These conditions however are only local and doubtless would vary considerably in any other location.

One authority gives costs of heating in percentages as follows:

Hot Air................. 6 to 7 per cent.
Steam .................. 8 to 10 per cent.
Vapor or Hot Water.... 10 to 12 per cent.

but the writer thinks these figures are a trifle high.

Cecil F. Herington

Best heat for this Man

To the Editor: Prairie du Chien, Wis.

Your article on “Heating” in March issue of American Carpenter and Builder came to my notice; and, as I am particularly interested in that subject at present, I am taking the liberty of asking you for advice.

I am building a frame bungalow, plans enclosed, and would like to know what kind of heating plant is suitable and would give best satisfaction. It is a difficult question for one who has no experience to decide. Dealers, of course, push their own particular system. One says Hot water; the next says Hot Air Furnace; another the Vacuum System; so what is the inexperienced man to pick for his own particular needs, without unbiased opinion.

As I mentioned before, the building is of frame construction; first story 4-inch siding 3 inches to weather; paper used throughout; shingled gables to roof. Building will face west but is protected from winds on north and west by heavy growth of pines. Winter temperature goes as low as 25 degrees, but this is seldom.

H. C. Clark.

Answer: If reply to Dr. Clark’s inquiry (which, by the way, is most complete and contains all the necessary information from which to get an intelligent grasp of the conditions) we would like to recommend a vacuum steam heating system which should cost at the outside no more than hot water and probably a little less.

This conclusion is arrived at from the following reasons: First, the extremely low temperature occasionally reached would raise havoc with a hot water system by freezing and bursting the radiators, pipes, etc., if the fire should ever be allowed to go out during the night by accident when such weather was being experienced.

Second, during mild weather the vapor systems operate about as economically and just as satisfactorily as hot water.

Third, during cold weather a pressure can be maintained in them just as in the ordinary steam systems.

Fourth, any steam system responds to the opening or closing of the boiler draughts much more quickly than the hot water.

Fifth, a vapor system eliminates the radiator air valve, avoiding the danger of leakage there and also permits the use of a graduated supply valve which permits as much of the radiator to be kept hot as desired in each particular room.

While the furnace is cheaper to install and requires pos-
Public Hospital for the City of Sterling, Illinois

The plans of this three-story and basement hospital show an ideal arrangement for a comparatively small building, which has been planned with the economic as well as the hygienic side in view. Compact and convenient, each part is easily and quickly accessible from every other part, which is essential where a small staff is employed.

The building is constructed of brick with cut stone trimmings. The exterior walls, instead of being furred off with strips as in ordinary construction, leaving a space between the wall and the plaster for the collecting of vermin, are treated with a heavy coat of damp-proof plaster bond, to which the plaster is directly applied. All interior partitions are of gypsum tile.

All interior finish is perfectly plain, without mouldings or projections to catch dust. Floors throughout are one panel, with simple panel moulds. Rock maple floors are used in wards, private rooms, and corridors; sanitary composition floors in toilet, service, and bathrooms, while the Operating Department, including anaesthetic and sterilizing rooms, is floored throughout with ceramic tile. Sanitary cove bases are used in all parts of the building of the same material as the floors in the respective rooms.

On the main floor are located reception room, office, wards, and private rooms, together with a small suite consisting of sitting room, bedroom, and bath for the superintendent.

The second floor is given over to private rooms and
small two-bed wards.

On the third floor, beside private rooms and wards, are located the Operating and Obstetrical departments, which occupy an isolated position at the north end of the building. This arrangement permits of flood of north light to enter the Operating Room at all times of the day through a large skylight which continues over the windows.

The basement contains X-Ray and drug rooms, laundry, dining room, and a large kitchen which is connected by a dumb-waiter with the small diet kitchen on the floors above. Two bedrooms are also provided for employees of the hospital.

The elevator is separated from the main corridors by a double set of doors, which prevents the noise of the elevator machinery being heard by the patients in their rooms. A separate boiler house outside the building contains the heating plant and fuel room.

Bring in a friend for our House Warming—we want to serve 40,000 more builders when we get into Our New Home. You will help us—won't you?—by showing one friend the special subscription offer on page 82.

Reminder

It was midnight. "Wow-wow-wow-wow!" wailed the baby.

"Four bawls and I walk," responded the ball-player daddy.—Amherst Four-Leaf Clover.

Way Out

Knicker—"A judge has ruled that a woman shouldn't spend more on clothes than on rent."

Mrs. Knicker—"Well, then, we shall have to pay a bigger rent."—New York Sun.

An Ingenious Profession

"Why do you want a new trial?"

"On the ground of newly discovered evidence, your honor. My client dug up four hundred dollars that I didn't know he had."—Louisville Courier-Journal.

Duty Held Him

The traveling salesman had three minutes in which to catch his train.

"Can't you go any faster than this?" he asked the street car conductor.

"Yes," the bell-ringer answered, "but I have to stay with my car."—Life.

He Won

"How's your brother, Tommy?"

"Ill in bed, miss. He's hurt himself."

"How did he do that?"

"We were playing at who could lean farthest out of the window, and he won."

Easier

Elsie—"After I wash my face I look in the mirror to see if it's clean. Don't you?"

Bobby—"Don't have to. I look at the towel."—Boston Transcript.

Embarrassing

"Do you ever see the President?" asked Willie of his uncle who lived in Washington.

"Yes; nearly every day," was the reply.

"And does he ever see you?" queried the little fellow.—Chicago News.
How to Make a Blue Print Frame

By Ira S. Griffith

THE blue print frame, the drawing of which is shown in the accompanying illustration is of good size for small prints. The same construction may be used and the frame made larger if desired, of course. The backing should be light and may be made of white pine. The frame proper should be strong and may be made of some hard wood such as maple or birch. The hardware, such as hinges and lifts, may be got at any hardware store. The brass springs and clips may have to be made by the amateur himself. In addition to these things there will need to be a glass of good strength, light plate, and also a pad of rather heavy soft felt of the same size as the glass.

STOCK BILL FOR BLUE PRINT FRAME.

Main frame, 2 pieces, ¾ by 1½ by 18 inches, S-4-S.
Main frame, 2 pieces, ¾ by 1½ by 13 inches, S-4-S.
Facings, 2 pieces, ¾ by 1 by 18 inches, S-4-S.
Facings, 2 pieces, ¾ by 1 by 13 inches, S-4-S.
Backing, 4 pieces, ¾ by 1½ by 8¾ inches, S-2-S. Pine.
Backing, 2 pieces, ½ by 8¾ by 11 inches, S-2-S. Pine.

Begin the work by sawing the pieces for the main frame to length, or rather almost to length. Allow about ¼ inch for smoothing off after the joints have been glued. Lay off the required distance between the shoulder lines and then work the box dovetails. Rabbet the inner back edges sufficiently to allow the ends of the brass springs to pass as indicated in the photograph. After this, these parts may be glued and assembled, care being taken to leave the frame square and out of wind.

While the glue is hardening upon these pieces the
facings may be prepared. These are specified the correct thickness and width so that all that is necessary it to lay out and work a quarter of an inch chamfer upon the one arris and then miter and fit them to the main frame. These facings are to be attached to the main frame by means of flat headed screws.

The backing is composed of two parts hinged together. This hinging and the double springs make it possible for the operator to take a look at his prints, or rather at one half of the prints, without disturbing the relative position of paper and tracing. Each end of each of these two parts should be reinforced by tonguing and grooving cleats thereon.

Several coats of shellac will give a suitable finish to this piece of work. The placing of the hinges and lifts and springs is indicated clearly in the photograph and drawing.

Design for Umbrella Stand

The umbrella stand shown in the accompanying illustration was made of black walnut and was finished in the natural color. In the bottom was placed a copper pan colored so as to harmonize nicely with the color of the walnut. The following stock will be needed for this piece of furniture:

Stock Bill for Umbrella Stand.

<table>
<thead>
<tr>
<th>Post</th>
<th>4 pieces, 1 1/4 by 1 1/2 by 28 1/4 inches, S-4-S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper rails</td>
<td>4 pieces, 3 1/4 by 2 1/2 by 12 inches, S-2-S.</td>
</tr>
<tr>
<td>Lower rails</td>
<td>4 pieces, 3 1/4 by 2 1/2 by 12 inches, S-2-S.</td>
</tr>
<tr>
<td>Slats</td>
<td>4 pieces, 3/4 by 1 1/4 by 21 inches, S-2-S.</td>
</tr>
<tr>
<td>Slats</td>
<td>8 pieces, 3/4 by 1 1/4 by 21 inches, S-2-S.</td>
</tr>
<tr>
<td>Bottom</td>
<td>1 piece, 3/4 by 10 by 10 inches, S-2-S.</td>
</tr>
</tbody>
</table>

Begin work by squaring the posts to length. If desired, the top ends only need be shaped, the measurements for the ends of the mortises being begun here and the surplus stock being removed from the lower ends of the posts after the whole frame has been assembled. After laying out the locations for the ends of the mortises, the sides for the mortises may be gauged and the mortises cut. Care must be taken to see that the mortises are laid out on the posts so that the posts pair properly. The amateur should know that face side and face edge of each of the posts is to be turned in. For this reason the best surfaces should not be selected for faces when the smoothing up is being done. If the face sides are turned in, the shoulders of the tenons are more likely to fit against the post snugly and thus make better looking joints. If one cannot visualize the locations of the mortises easily, that is, if he is uncertain in laying out their locations and that he is getting them on the right sides of the posts, he may set them up in the positions they are to occupy relative to one another and mark roughly as with penciled circle their approximate locations upon the posts. After this is done the posts may be laid flat upon the bench top and the exact lines placed thereon by accurate measurement.

The rail stock is surfaced on two sides to thickness and it will be necessary to square up the edges and ends to proper dimensions. It will be noted that the lower edges of the lower rails are curved. When the rails are to length and width the tenons may be laid out and worked.

The slats, like the rails, will need to be worked to proper width and length. It is well to house the whole end of each slat into the rail. This method is much easier and just as serviceable as shouldering the ends of the slats so as to make tenons thereon.

Use good hot glue and plenty of clamps and put two of the sides together. After the glue has hardened upon these, the remainder of the frame may be assembled and the whole frame clamped together.

The following finish is quite satisfactory for black walnut: Thoroughly scrape and sandpaper the surfaces, removing all surplus glue. Apply a coat of paraffine oil, allowing it to stand about five or ten minutes then wiping off the surplus with a cloth. If paraffine oil is not to be had, boiled linseed oil will serve the purpose equally well. Allow this oil to dry over night then sandpaper very lightly using number 00 paper. Upon this apply a very thin coating of shellac, either orange or white. Sandpaper this lightly with the fine sandpaper and apply several coats of wax, polishing each coat well with a flannel cloth. If the light colored wax is used care must be taken not to allow it to accumulate in the corners or in the pores of the wood. Put on just as little as possible and still cover.
**Detachable Door Hinges**

It seems that the ingenuity of the builders hardware people will never run dry.

It is getting near the screen door season again—which calls to mind the annual struggle of the housewife to get her screen doors put up. This will be an easy task now. There is a detachable hinge obtainable which operates as shown.

Notice that the small button and plate remain on the casing while the main part of the hinge is put away with the door. There are no loose parts to get lost. One quarter turn of the button locks or unlocks the hinge.

Carpenters and builders can make their customers happy this year by putting on detachable door hinges like these.

**To Buy Gravel or to Crush Stone—Which?**

Every contractor doing any amount of concrete work has of gravel. He is the gravel man's best customer in spite of the fact that he may have, close at hand, an unlimited supply of rock which, if he could only break it up into small pieces, would make just as good an aggregate and possibly better, than the high-priced gravel.

Some contractors who have kept careful records, have given this a lot of study and have decided they were paying too much. They have put in a small rock crusher, operated by a low power gasoline engine and with it have not only gotten rid of large stones and rocks which otherwise would cost good money to haul away, but also have secured the best sort of aggregate for their concrete work.

The crusher illustrated is adjustable so it can be used to deliver stone of any size, from very fine torpedoid grit up to as coarse as 2½ inches. Contractors who make their own cement blocks, cement tile and other molded pieces, can make extra use of such a crusher. The cost is said to be very small considering the work they do, and the way they are built.

**New Garbage Burner**

Housewives everywhere are getting to be more particular. They are insisting that all the refuse and garbage be entirely destroyed and not simply dumped out in the back yard to become a nuisance.

The owners of city apartments are putting in especially designed incinerators or furnaces to consume garbage and this idea is spreading to the suburbs and wherever there are first-class residences.

A new type of incinerator as illustrated has recently been developed. It seems to be just the thing for the average size apartment building, hotel or private residence. This is a gas burning incinerator. Unlike some incinerators, this one is odor proof. The mass of refuse to be consumed is dried out and then completely consumed, all vapors passing up the chimney. A minimum amount of fuel is required.

Our people are keen these days, for everything sanitary and labor-saving; and it is expected that many will want a garbage consumer of this kind.

**Corner Door Hangers**

A sliding door that sometimes comes to the builders' rescue when he is working in cramped quarters, is the one that slides in around the corner. When the door is open it stands at right angles against the inside wall of the building at right angles to its closed position.

The tracks and hangers for such a door are illustrated here. This is probably a good deal of a novelty to the majority of builders, yet it is thoroughly practical, easily applied and operated. It is in successful use on thousands of doors.

Note that the track on the wall at right angles to the opening projects into the wall far enough to allow the door to close tightly against the wall.
The George Pivot Window

The newest thing in improved window appliances is illustrated. It is a complimentary sliding style which, when applied to the regular double hung window construction, makes it possible to revolve the sash inward as well as to slide them up and down in the regular way.

Those who have used this window construction, testify that it is thoroughly satisfactory, simple, safe, convenient, inexpensive and weather-proof.

This appliance is made with various metals as best suited to the windows where they are intended to be used.

They can be applied to old windows as well as to new. Builders will be able to discover many advantages in windows of this sort and doubtless will find many opportunities to use them.

A Form Wire Tightener

What does it cost you to build your forms for concrete work? Does the figure allow you a sufficient margin of profit, and can you depend on it as certain?

How much does it cost you to build forms for concrete foundations?

A very ingenious yet simple wire tightener for form work has recently been placed on the market—a cast iron spool which requires only a common wire nail as a locking device. A pair of combination pliers and wire cutters to cut off the wire is the only tool that is needed.

As this concrete form wire tightener becomes generally known, it will certainly be in great demand. Doubtless you have been handling your concrete work at a profit, but if you could have done just as good work at less cost, you have lost real money.

All builders should enjoy larger profits on concrete foundation work.

Clay Show A Huge Success

The Second Clay Products Exposition has drawn to a close but not without results. During the period of Feb. 26 to March 8, a great educational campaign was conducted in the city of Chicago by the clay manufacturers of the country. Thousands upon thousands of persons visited the magnificent exhibition of brick and other clay products at the Coliseum, and were taught the benefits of using clay products.

To the average person, a brick is a brick and a mortar joint means nothing; but the multitude of brick panels brought questions which surprised and pleased the exhibitors. The question of bonds and mortar joints also came in for consideration and undoubtedly a greater knowledge of clay products was never sought in a similar period of time.

The exhibitions were remarkably artistic, the main aisle which represented the brick sold by Chicago dealers being a wonderful and artistic garden wall from which proceeded a beautiful pergola. Over this was thrown with effect green foliage with small pink and white flowers.

The exhibit of the American Carpenter and Builder, illustrated herewith, called forth the praise of our many visitors. The space occupied extended through two regular spaces, fronting on the central north and south aisle and the one immediately adjacent to it on the east. It was directly south of the Chicago Face Brick Association exhibit and occupied a space 13 by 24 feet.

As a whole, the show was a huge success, the exhibitors were well satisfied and the educational work performed was so extensive that it is impossible to compute in dollars and cents the exact profits of the Second Great Clay Products Exposition.
Our Readers are Requested and Urged to Make Free Use of These Columns for the Discussion of all Questions of Interest to Carpenters and Builders

Loose Leaf Binder for Building Plans
To the Editor: Oneonta, N. Y.
A few years ago we purchased a loose leaf binder which would take sheets of the size of the pages of the American Carpenter and Builder. Whenever the magazine comes we remove the various plans and place them in this binder. We have been doing this for about four years and at present time have a very complete collection which pleases practically every house builder's needs.

N. H. Briggs & Son.

Note: The better way we think is not to mutilate your magazines, but bind up all. You will find other features besides the plans valuable for reference. We can now furnish you a first class binder for each volume, 6 numbers, of the American Carpenter and Builder. Editor.

How High is this Frame?
To the Editor: Standard, Cal.
I appreciate my American Carpenter and Builder so much that I am enclosing a photo of a model gallows frame such as we build for double compartment mining shafts. If you care to give it space it would be interesting to receive estimates as to its height from our fellow chips.

H. P. Douglas.

How Can He Redress This Floor?
To the Editor: Colon, Mich.
I was just recently called upon to dress down, suitable for a nice finish, a floor that has been laid 37 years. It is white ash and wild cherry. The boards are about 2 inches wide laid alternately.

Now the trouble is the floor has been treated to a good covering of linseed oil which, of course, darkened it very much and makes it look grimy and dirty. The people would like to have the floor surfaced and a good varnish put on. I tried a floor scraping machine but could not keep an edge on the knife for more than three strokes, then was obliged to sharpen the knife again with same results.

I then tried it by using hand tools with the same results. Now the question is how am I to get rid of that finish that is on, so I can make and keep the tools cutting without so much trouble and be able to finish the floor as it should be?

I enjoy the American Carpenter and Builder more and more as I progress in the trade. Wm. E. Ware.

Wants to Make a Player Piano Music Cabinet
To the Editor: Louisiana, Mo.
I would like to ask you to publish plans for a music cabinet for a player piano.

M. B. Shevies.

An Improved Ironing Board
To the Editor: Barrington, Ill.
I notice on Page 76 of the February number American Carpenter and Builder that Mr. A. D. Bailey requests a plan of an ironing board.

I enclose herewith a plan of one I made for my mother and she is well pleased with it. It would be of interest to me if you would publish a plan of a tool box at your convenience.

Sanford E. Sieve.

Height of This Frame Has Been Guessed All the Way from 1 to 60 feet. How High Is It and Why Do You Think So?

-Quoted.}

How Can He Redress This Floor?
A No-Leak Porch Floor

To the Editor: Mulvane, Kans.

In reply to your request for our opinion of the March number, I have to say that I think each succeeding issue since the first, in April, 1905, is the best ever—but you have certainly succeeded fine this time. I am more than pleased, and am always impatient to get each number to see what new thing has been discovered.

In studying the prize sketches I wish to make this inquiry: In third prize, Class A, page 44, March number, how do you get from parlor or den to the dining room? Is there an underground or overhead passageway? Of course it would not do for company to pass through a bedroom to D. R.; and the cook would chase them out of the kitchen if they came that way. I think I should make a swap, den to bedroom; B. R. to D. R.; and D. R. to den, putting the three main rooms together. See!

Replying to C. B. Jay, Waldron, Mich., will say that I have put in such floors (in a double deck porch so as not to leak), working after good architect's plans in this way: First deck over solid and put on either tin or a good grade of ready roofing, over this put a slat floor of 144 with 14 or 16-inch space between boards. Make this floor in any convenient width sections, say, 3 or 4 feet, and as long as the porch is wide, using three or four cleats of 1/8 undersize and be sure to clinch all nails thoroughly. Let this floor be long enough to come just inside of or under the balcony rail.

H. E. McCreight.

The Shed Rafter Again

To the Editor: Rochester, Minn.

May I—without discourtesy—offer the following from a practical builder regarding the problem of the shed rafter, joining the main rafter which was discussed by Mr. Woods in the February number, and by Mr. Gray in the March issue of your worthy magazine? Possibly you may consider that the matter is properly laid at rest and should not be disturbed. But some of us think that it should not lie as it lies.

In February, Mr. Woods gave the length of shed rafter as 13 feet 2 5/8 inches. Mr. Gray says the length should be 13 feet 4 3/16—about.

In March Mr. Woods says they were both wrong—and that the length should be 5 3/4 inches less than stated by Mr. Gray, thus making it about 12 feet 10 3/16 inches.

The writer says—if the editor will allow him—that the correct length of the shed rafter from a point plumb over the outside corner of plate along its top edge to its junction with the main rafter is 13 feet 3 1/7 inches—plus practically 1 6. This, when the conditions are as clearly stated by Mr. Woods—and shown by his diagram—with the center line of each rafter running through the outside corner of the plate—and the rafter being 4 inches wide.

So the length last given by Mr. Woods is farther wrong than his first one was.

There is less than 1/8 inch difference between the plumb heights of main and shed rafters—measured from outside corner of plate to top edge of rafter in each case.

This is where Mr. Woods goes astray—as do a great many good carpenters—in similar problems.

In the diagram shown, there is no difference in the length of the shed rafter—whether measured from the corner of plate along its dotted center line to the edge of square—as shown; or from a point plumb over the outside corner of plate along top edge of rafter to its junction with the main rafter.

Thus the top edge of shed rafter is lowered this scant 1 6 inch requiring an extension of run of 2 feet 7 inches (a fraction less) instead of 2 feet 8 inches. So, instead of 5 3/4 inches, Mr. Woods should have deducted 11/20 inches only.

John Parkhill.

Kitchen Cabinet and Cupboard

To the Editor: Harpster, Ohio.

I am taking the liberty of contributing a few lines to your valuable paper, which I consider the most valuable paper of its kind published. I am always looking for something new, some better way, something more pleasing to the people I deal with and I have never found a better place to mark the top cut of shed rafter resting on main rafter, it is not necessary—as might possibly be inferred from the article—to draw a diagram.

For these two, or any other two pitches—of 60 or more—this top cut can be found and marked directly on the rafter in ten seconds, with the aid of my Universal pitch gauge.

Trusting that this may help towards clarifying the problem, I am still aware that my statements may be disputed. However, my business requires me to take considerable risks on the correctness of my conclusions and figures, and I am quite willing to do the same on those here given.

John Parkhill.

H. E. Swartz and His Kitchen Cabinet.
than through the pages of this paper.

I am enclosing two photos of a combined kitchen cabinet and cupboard, which I have just finished; design is one of my own. This is the third piece of this kind I have made this winter.

Now I will say to the brothers, should any one like to try his hand at a piece of furniture of this kind, just write me and I will be glad to send him pencil drawings. This is made of solid oak, strictly hand made and sells at $60.

H. E. Swartz,
Carpenter and Contractor.

+ Handy Tool Chest

To the Editor: Benton, Wis.

I am sending a sketch of a light tool chest I made out of a dry goods box, which was of three-ply material, however, ⅛-inch material would do just as well. These chests give ample room for a full set of carpenter’s tools. They have an advantage over a large chest in being light and easy to carry anywhere about the building, which with the ordinary chest cannot be easily done. In this they save time and money.

Chest No. 1 is for saws, chisels, bits, hammers, hatchets, snips and all small tools.

Chest No. 2 is for planes and miter box.

The chests are stained a reddish brown and the tin on the corners is painted black, which gives a very handsome effect.

The AMERICAN CARPENTER AND BUILDER is always a welcome friend to me. Elsworth Brown.

+ Troubled With Water Logged Steam Radiator

To the Editor: Maplewood, Mo.

I have had installed in a six room residence a steam heating plant. Six radiators are taken from the circulating main and a 25 ft. radiator direct from the boiler. The radiator direct from the boiler and two of the second floor radiators do not heat readily; when the steam is turned on they seem to contain water. There are no “traps” in the piping. What could be the cause or causes of water remaining or being carried to these radiators?

Answer: We would judge from your description contained, that either the piping leading to these radiators is too small, that the valves to certain radiators are not always closed tightly when steam is shut off, or that the radiators are installed in such a way that they do not have the proper slant which should be given in order for them to drain themselves after the steam has condensed.

We have assumed in the above that your heating plant is of a one pipe nature. The installation of pipes which are too small in a system of this kind does not allow ready drainage from the radiators, since it is difficult for steam to get in and water to get out through a small opening at the same time. We have known instances where radiators were installed on floors which were not level or which sagged to such an extent that the air valve end of the radiator was considerably lower than the steam end. Such a condition caused difficulty through the collection of water in the lower end of the radiator.

+ When to Add the Hair?

To the Editor: Newland, Va.

I have been a subscriber to the AMERICAN CARPENTER AND BUILDER ever since it was first published, with the exception of one broken link, and have the honor of being one of its charter members and I am a much better carpenter now than I was before I began reading its pages. Now, Mr. Editor will you or some member of this great family tell me the proper time to put hair in lime for plastering, whether at the time of slaking or when the slake is made in mortar for plastering, supposing the lime to be slaked several weeks ahead of being used. Will the lime destroy the hair?

W. T. Reamy.
To Find the Miter

To the Editor: Roselle Park, N. J.

I am sending a sketch of a simple way to get the cuts for any given angle. For instance, if you have an obtuse or acute angle panel to mold, you would have to get the intersection in order to get the cut. This may be easily found by first drawing a half circle of any dimension.

Referring to Fig. 1 any one should know from A to B is the miter line for a square corner. The same principal applies to any given angle, as shown in Fig. 2. Now take a bevel and set it to the angle and apply it to the center of the semi-circle, as shown in Fig. 3, and the line C D will give the cut for the mold to fit in the angle.

I hope I have made this clear and that it may be of some use to other carpenters. I also wish to submit the following:

To make an Old Plane Good as New. If any of the boys have a plane smoothing plane that has a large trough caused by much use, try putting on a shoe of sheet brass and you will have a plane equal to an iron one.

MORRIS EARL.

Making Test Boring

To the Editor: Pasadena, Calif.

Will be pleased if you can give me any information in regard to what kind of tools or apparatus is used by the test boring contractors in Chicago?

In making tests for the bearing power of soils, do you consider a square inch test as reliable as a square foot test? What is the best way to make a test of the bearing power of soils without too much expense? WALTER S. CHASE.

Answer: An ordinary wood auger, fitted with a long shank and arranged so that additional lengths of rod may be screwed onto this first piece, may be used for this purpose. Often where samples of earth at different depths are desired, an ordinary two-inch pipe is driven down into the earth from a raised staging. Where great care is necessary in determining the kind of earth at a given depth, a pipe casing is driven down as fast as the auger bores the hole. This casing prevents earth from falling into the bored hole and allows the auger to pull up a sample of earth from the locality near the end of the driven pipe casing. When shallow holes are to be dug for testing purposes, an ordinary post hole digger may be used.

We believe that the square foot test for bearing power of soils is far more reliable than would be a test made upon a single square inch of area. In fact, tests on a square yard of surface are often made where it is feared that the square foot test will not produce reasonable results. Often a piece of apparatus built like a large table with four legs is used. Each of these legs is one square foot in area at its bottom surface. This table is then loaded on top by a known system of weights distributed equally over the top and observations are made in regard to the disturbance in soil around the foot of the legs of the table. Where a single standard is used for determining bearing power, a platform is arranged on the top of this single standard and the load applied on the platform. Often a hole about three feet deep is used to set the standard into when making the tests. This hole should be at least eighteen inches square for a twelve-inch square standard.

Lines of small sticks driven into the ground and radiating outward from the center of this hole will provide a means of determining whether the surface of the ground is disturbed when load is applied upon the platform. Such disturbances may be measured by carefully lining up the tops of the sticks at the start by means of a spirit level and afterwards taking frequent observations with the level placed upon the tops of these same sticks. Any rise in the surface of the ground, due to the loading on the standard, will be apparent by change in level of the tops of the sticks.

E. L. LANGE.

Doing Work Fast—Another Bungalow Cornice

To the Editor: Nucla, Colo.

In this section, our fir dimension is usually sized one side and edge and if used on exposed cornices, as rafters, the other side must be planed by hand or on a buzz planer or else the entire lot taken to the mill and run through a surfacer. Also a 2 by 4-inch rafter with a projection of 30 to 36 inches, as is common on a bungalow cornice, looks very small, for, which reason I generally use a 2 by 6-inch rafter end spiked to the main rafter. This also allows a different pitch to be made on the cornice, if desired. I cut my rafters with a 3-inch square heel and ends with 2½ inches above notch, for planier use 6-inch partition and resaw, making two 3½-inch pieces, which when put on brings rafter ends up to main rafters. Then roof boards on top of this. For facia, use a ½ or a solid cove as shown in sketch, below cornice. The drawing also shows a style of rafter end that is easily made by boring a 1½-inch hole and sawing into it. I use a 6-inch frizee, pushed up tight under rafters, then a 1 by 6 cut in between each rafter and set square with rafter and nailed in place is much faster than notching out; a cove or quarter round set under this completes the job and makes a fine looking cornice. This frizee should be completed before the planier is put on.

S. M. PRESTON.

Quick Roof-Boarding

To the Editor: Cathlamet, Wash.

As I am sitting here this evening looking over the November number of the American Carpenter and Builder, I read the article of I. P. Hicks. Thanks to I. P., it is not the first one; I have found much information in reading his and other articles in the American Carpenter and Builder.

Now I would like to add one on cutting sheating for his roof. I take the proper board and cut the sheating for the hips on the ground, cutting the boards—some in the middle and others near one end—but always leaving both pieces long enough to be used. When I have enough to go two-thirds way to ridge, I take them up and nail on; and by nailing first one end to go to right of hip the other end of board, by reversing sides, is a fit for left side; this saving one cut.

HANS B. LANK.
How to Find the Liquid Contents of a Horizontal Tank

To the Editor:

Boston, Mass.

A recent correspondent asked for a method of finding out the number of gallons of water in a horizontal tank 18 feet long, 6 feet in diameter and having a 30-inch depth of water.

The solution of this problem is given together with a method of constructing a curve so that any person can find out at any time the amount of liquid,—water, gasoline, or anything else which he may have in any horizontal tank, of which he knows the dimensions and the depth of liquid. Taking up first the specific case asked for:

Referring to the left hand figure, the half diameter CE is 3 feet. CB and AC are also equal to 3 feet. We know also that DE is 2.5 feet and CD is 1/2 foot. What we wish to find first is the area of the segment ABEA and then deduct the area of the triangle ACB.

Knowing CB, the hypotenuse of a right triangle, of which CD is the known altitude, the base DB is found from the formula $DB = \sqrt{(CB)^2 - (CD)^2} = \sqrt{9 - \frac{1}{4}}$. From this, $DB = 2.958$ feet.

The area of the triangle $ACR = \frac{1}{2} CD \times AB = CD \times DB = 1.479$ square feet.

When finding the area of the sector ACBEA we must know the angle made at C by the lines BC and EC. We know that the tangent for that angle is represented by $\frac{DC}{DB}$. This equals 3.916, therefore the angle is 80 degrees 26 seconds. (This may be obtained from any angle table). We thus know that the entire angle $ACB = 160$ degrees 52 seconds. As the entire circle contains 360 degrees, the portion of the circle covered by the sector $ACBEA = \frac{160.87}{360} = 0.4468$. Now the area of the entire circle is $3.1416 \times (radius)^2 = 9 \times 3.1416 = 28.274$ square feet. The area of the sector, therefore, will be $0.4468 \times 28.274 = 12.812$ square feet. Deducting the area of the triangle $ACR = 1.479$ square feet, we find that the area of the segment is 11.333 square feet.

As one gallon contains 231 cubic inches, while one cubic foot is 1728 cubic inches, there are 7.48 gallons per cubic foot. As the area of our segment is 11.333 square feet and the length is 18 feet, the volume of water is 204 cubic feet. Multiplying this by 7.48 we find that there are 1526 gallons of water in the tank.

Now, to make this general for any cylindrical tank with horizontal axis: We work the thing out on the same basis for a series of proportions of depth such as shown in the right-hand figure—one-tenth, two-tenths, three-tenths, etc., and figure it out in proportions of the total capacity of the tank—one-tenth, two-tenths, three-tenths, etc. From this we can construct the curve HIJ as shown. Then we can substitute on the scale of depths the actual depths in either inches or feet, and on the scale of capacity the actual capacity in either cubic feet or gallons, whichever may be most convenient. Then, knowing the depth, $ED$, we carry this over to the curve by the dotted line to $F$ and drop down by the dotted line FG to the capacity scale, where we find that the tank contains 0.41 of its full capacity. This would give the same result as before, though perhaps not quite so accurately. It will, however, be sufficiently accurate for all ordinary purposes.

We plot the curve as follows, having figured it in the same manner as for our specific example:—The capacity of the tank at one-tenth its depth, is found to be 0.052 of the full capacity. We place this point at $K$ as shown. Similarly, finding that at two-tenths the total depth, the capacity is represented by 0.1424, we plot this point at $L$. In the same way we find $M$ at 0.2523 of total capacity, $N$ at 0.3842 of total capacity, while $P$ at half depth will be known at once to be just half the total capacity, because the upper half of the circle is identical with the lower half. Having thus one-half of our curve, the upper half may be obtained by plotting backwards from $J$ in the same manner as we have plotted upwards from $H$, and the curve may then be drawn in. Then any depth, such as $Q$, may be carried across by line to $R$ and the amount of liquid involved may be read at $S$ on the capacity scale.

SINDEY G. KOON, M. M. E.

The Water Tank Problem

To the Editor:

New York City.

In regard to the question asked by F. C. McCellan in March AMERICAN CARPENTER AND BUILDER about the number of gallons of water contained in a horizontal boiler 18 feet 0 inch long and 6 feet 0 inch in diameter when the water is 30 inches deep, I would like to suggest the following solution:

The diameter, length and depth of water being given it is only necessary to find the cross sectional area of the water in square inches and multiply this by the length of the boiler in inches in order to get the number of cubic inches of water. This divided by 231 (the number of cubic inches in a gallon) will give the number of gallons in the boiler. Doubtless the stumbling block was getting the cross sectional area of the water when it stood 30 inches deep, and for that purpose I desire to call attention to the sketch herewith (Fig. 1), which shows the conditions, as I understand them, together with a few lines I have added for the purpose of making my method of figuring clear.

It will be noted that I have drawn the vertical axis and have also connected the points A and B with the center of the boiler at C. I now have two right triangles AMC and BMC which are equal in every respect; CB, CA and CN are equal to the radius of the tank or 3 feet 0 inch, and as MN is the depth of the water (30 inches) CM must be equal to the hypotenuse CM = $\sqrt{(CB)^2 + (CN)^2}$ = $\sqrt{9 + 9} = 3.16$ feet.

FIG. 1.

The Water Tank Problem
to CX (3 feet 0 inch) minus MX (30 inches), or 6 inches. Therefore our two triangles each have the hypotenuse or long side 3 feet 0 inch and one short side of 6 inches. Therefore our triangle is as shown in Fig. 2 and CM (6 inches) divided by CA (36 inches) will equal the cosine of angle C or .1666 which by reference to a book of sines shows angle C to be about 80 degrees and 25 minutes, and the sum of the top angles of the two triangles will, of course, be just twice that of one or 160 degrees and 50 minutes.

The area of the entire cross section of the boiler is simply the area of a 6 feet 0 inch circle or 4071.5 sq. in. Since the sum of all the angles possible to erect around C with the center C as an apex is 360 degrees the area included inside the lines CANBC will be proportionate to the entire area, as the sum of the degrees of the two top angles is to the total number of degrees. This is expressed as : 

160 degrees 50 minutes : 360 deg. 0 min. :: x : 4071.5 sq. in.

Then (CA)? — (CM)? equals (AM)? or 1296 — 36 equals (AM)?

\[1296—36 \text{ equals (AM)}? \]

\[36°—6? \text{ equals (AM)}? \]

Then the area of the two triangles is equal to twice the base times the altitude divided by 2 or \((6 \times 35.4 \text{ divided by 2}) \times 2 \text{ or 212.4 square inches.} \]

Deducting this from the entire area CANBC leaves the water area alone or 1816.8 — 212.4 equals 1604.4 square inches.

\[1816.8 — 212.4 \text{ equals (AM)} \]

\[35.4 \text{ in.} \]

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\[1816.8 — 212.4 \text{ equals AM or 35.4 in.} \]


twin or tacked to the top of the work bench while the middle piece is loose and acts as a key to hold any ordinary width stuff on edge, while being worked as the sides pieces are so set as to adjust the key piece to the piece being worked.

R. O. BYBEE.

**A Good Bench Stop**

To the Editor: Uintah, Utah.

I am sending herewith a sketch of a bench stop. It is made of three 15-inch pieces; the two outside pieces are screwed and the center piece is tacked to the top of work bench while the middle piece is loose and acts as a key to hold any ordinary width stuff on edge, while being worked as the sides pieces are so set as to adjust the key piece to the piece being worked.

R. O. BYBEE.

**Looks Like a Dangerous Trick**

To the Editor: Oak Hill, W. Va.

Would like to see a little trick of mine in your paper perhaps it is not worth it.

I took a small bottle of gasoline and ran a wire through a stopper; fixed a little asbestos on the end of the wire but so it would touch the gasoline. When I want to light my corn cob, I hold the little torch up close to the wire-plot on engine, make a spark with a wrench and presto! I have a handy light.

H. M. THURMOND.
Hanging Large Accordion Doors

To the Editor: Hackensack, N. J.

I wrote you about hanging of accordion doors, as I had a job to put up a set of them in the armory of Co. G., N. G. S. N. J. We removed the stage, which was 4 feet above armory floor; and raised it up, making a 11-foot ceiling. This required an iron girder 48 feet long, 30 inches deep and weighing 5,700 pounds. We thus made a room on second floor 24 by 60 feet long, for a company room holding 65 steel lockers for uniforms, also toilet and shower room.

The girder to which the track is bolted is 24 feet from the rear wall. There are ten full size and two half doors. The full size doors are 4 feet 2 inches wide and 8 feet 6 inches high, with Florentine glass in top, 42 by 48 inches. They work fine, better than 3-foot doors, as there are not so many butts to bind. The wider the doors the less hanging stiles you have.

I used a regular 5-inch mortise lock and knobs, which works fine. These photos will show the boys of the AMERICAN CARPENTER AND BUILDER that doors over 3 feet wide can be hung and work all right. They will learn something by it, for I never hung or saw any work at all until I saw them in the AMERICAN CARPENTER AND BUILDER. And then I did not follow directions, for I made them 4 feet 2 inches wide; and they are a success. The hanging strip for the half doors to be left loose with a rabbetted piece to hold it in place.

In upper picture reading from right to left are A. Monroe, contractor; E. Zimmerman and helper, plumber, and W. Fryhlick and H. Gross, carpenters. ALONZO MONROE, Carpenter and Builder.
A Carpenter's Wife Speaks

To the Editor: Bieber, Cal.

I desire to know through AMERICAN CARPENTER AND BUILDER or direct, how to lay out a small steam dry kiln about 20 by 24 feet, 8 feet high. I want to use 1-inch pipe. The kiln will be framed of 2 by 4's. Sheathed outside and inside with rough boards with sawdust between. Any suggestions will be appreciated.

J. P. McLarty, Contractor and Builder.

A carpenter can be all that health, ambition, and the AMERICAN CARPENTER AND BUILDER can make him. He may earn more than any other "fellow" around; but what good will that do him, if he has a wife that does not keep the double-tree of managing and planning EVEN—a wife that is said does not "team" with the husband in the thousand duties of the every-day work—one that can spend just a little more than the husband earns, and so that he can hardly realize where it all goes to!

Frank says if I'm going to send this letter I better not sign my name or else he would authorize the post master not to send it, as he didn't even want the editorial staff to know what man had such a wife—there being no danger that it would ever be published.

This is how I try to help "my carpenter": I keep a little note book by the telephone, so if there are any calls for Frank while he is absent, I put down the name and the time such parties called. Then when Frank comes home he can call them. Or if he is out in the country, I 'phone out to him at noon or evening, so if the parties have not already spoken to him he can call them.

I also do much of his bookkeeping, for instance: Frank brings home statements of material used on certain jobs, and also the time of the laborers, and as these mostly consist of simple figures, it is not at all difficult, and I can do it in odd hours.

In the winter he makes furniture, always something new. He calls them "fool notions." He just loves to do that—that is, all except the finishing. So I studied up on the staining and varnishing question, and with time and patience I've gained enough knowledge so I'm quite successful in obtaining beautiful finishes on most all kinds of wood.

Frank is putting away his drawing material, so I must seal this before he gets it, for if he reads it, it won't even get started towards the post office, not to speak of ever reaching Chicago.

I would value the experience and opinion of other carpenters' wives very much, and providing the editor sees it advisable I hope to see in these columns of the next issue something about what the wives can do to help things along for the carpenter husband.

Frank's Wife.

+ Floor Laid in Hot Tar

To the Editor: Bridgeport, Conn.

In the last number of the AMERICAN CARPENTER AND BUILDER, was a question, how to make a porch floor water proof. In my experience I find that if you use good flooring laid in hot tar, it will make the porch water proof, and at the same time it is very cheap and good.

Henry Oshberg.

+ Belfry Designs Wanted

To the Editor: Bießler, Cal.

I would like to see, in your valuable paper, some designs for a belfry on a school house, to be built on the mission type hip roof.

J. A. Jack.

+ Questions for Dry Kiln Experts

To the Editor: Willburton, Okla.

I desire to know through AMERICAN CARPENTER AND BUILDER or direct, how to lay out a small steam dry kiln about 20 by 24 feet, 8 feet high. I want to use 1-inch pipe. The kiln will be framed of 2 by 4's. Sheathed outside and inside with rough boards with sawdust between. Any suggestions will be appreciated.

J. P. McLarty, Contractor and Builder.
Bind Your Magazines

These strong, durable Binding Covers (the well-known "Torsion" Steel Wire Binder) Now Ready for Delivery to You at Manufacturer’s Cost.

We are glad to announce that we have had 10,000 of these excellent Binding Covers made up for you—handsomely lettered in gold on maroon Art Canvas as shown in the photograph. The Back Stamp is a De Luxe Three Color Label with spaces left for you to write in the dates and the volume number.

You will like these binders. Each one holds six numbers (1 volume) of the American Carpenter and Builder. We have had them made up in huge quantities and accordingly at a very low price—and now offer them to you at cost—as we want every reader to preserve his copies and refer to them constantly.

Bind up the back numbers you have—Vol. XIV has just been completed —And start now to bind each number as it reaches you. You can save a considerable amount by buying several binders now.

SPECIAL LOW PRICES TO OUR FOLKS

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View of inside of Binder showing Solid Steel Plate “Back Bone” and flat steel locking rods. Each one of these rods is slipped through the middle of a copy of the magazine and is quickly and easily snapped fast. There is no punching, cutting or mutilating whatever. Each copy is bound in snugly—yet can be opened absolutely flat. Keeps your magazines clean and fresh—and right where you want them for ready reference.
Clay Show Prize Cottage

One of the features of the Clay Show was a brick cottage. It was built in a very attractive manner of common brick, and with such carefulness that visitors—both brick manufacturers and others—were greatly surprised at the attractive exterior that this common brick presented. The structure was roofed with clay tile. This was the prize house of the show and was given to the one guessing the nearest number of marbles contained in a jar. The winner of the house was John Mulligan, 400 Webster avenue, Chicago, who declared there must be about 5,377 marbles in the jar. This proved to be the exact number.

The structure contained six rooms, with a living room, dining room, and kitchen on the ground floor, with three bedrooms and a bath on the second floor. Visitors entered this brick cottage through a door which led to the living room, and they were taken through this room to the dining room.

One of the features of these two rooms which appealed to every one who entered was the fact that the entire structure was built in less than a week, and the interior of the building was completed for inspection one day after the brick walls were constructed. Visitors were puzzled as to how the inner walls had been plastered and thoroughly dried in this short period of time. Quite frequently some of the wise ones could be seen tapping on the walls with their knuckles to see if they could determine the material which had been used in the construction of these walls. In most instances these investigators went away puzzled.

As a matter of fact no plaster was used in this building, but a fireproof wallboard which the manufacturers say will not warp, expand or contract. It is the product of the Bestwall Manufacturing Co., a Chicago firm, and known to the trade as “Bestwall.” This material is made in various sizes and can be applied quickly and easily and was used in the prize cottage because of the fact that it becomes a finished wall as soon as the last nail is driven.

“Bestwall” is a mineral composition and can therefore rightly be called fireproof. The walls of these two rooms were papered with ordinary oatmeal paper, retailing at not more than 30 cents per roll. From the dining room, entrance was had through a doorway to the kitchen whose walls were likewise constructed from “Bestwall,” but instead of the oatmeal paper a cheap enameled paper was used, giving the effect of tile.

Entrance to the second floor was had from a corner of the living room and in close proximity to the main entrance of the cottage. This stairway led to a large hallway on the second floor from which entrance was had to the various rooms on this floor. A floral design paper was used in this hall and stairway.
One of the Large Bedrooms

In all rooms the ceilings were all made of "Bestwall," upon which was papered a plain tint paper. Beamed ceilings were carried throughout the entire plan appearing in practically every room. A noticeable feature was the absence of panels which are usually present where wallboard is used. The reason for this is the perfect manner in which "Bestwall" is manufactured. When two ends of this material meet there is no noticeable difference as this material is made of a uniform thickness. Moderate priced wall paper was used throughout the building, none of it retailing in price over 30 cents per roll. The cottage was designed by Walter Burley Griffin, the architect whose plans for the capital city of Australia were recently accepted by that commonwealth. In order to rush the building to completion it was constructed in six days and Mr. Griffin worked in connection with the masons and the Bestwall Manufacturing Co. very harmoniously, the various parties having in mind the limited amount of time at their disposal. The exterior work was completed on the 24th and the wallboard put in place on that date. It was papered the next, and within 24 hours was thrown open to the public.

Keyless Chest Lock

The illustration herewith shows a lock that has been particularly designed for carpenters' tool chests. It is known as the "Standard Time" keyless chest lock and is operated by the knob in three seconds. This is not only a protection for valuable tools, but is a great convenience. Frequently keys are lost, or when tools are wanted in a hurry, the keys are forgotten. In either case it is sometimes necessary to rip open the old lock, or to have new keys made, both taking unnecessary time and money.

The "Standard Time" keyless chest lock is made by the Miller Lock Co., Frankford, Philadelphia, Pa. It locks automatically as the lid is closed. No two combinations are alike. It can easily be opened in the dark and is made to fit chests ½ inch thick and up. It is made of brass, well finished and fully guaranteed.

Further information and prices will be gladly furnished by writing the Miller Lock Co., Frankford, Philadelphia, Pa.

How to Operate a Woodstocker

We have recently secured some drawings showing how easily different kinds of work may be done on Fay-Egan "Lightning" Nos. 62 and 63 Universal woodworkers. Also a photograph of some of the work. (See pages 104 and 106.)

Beginning with the two upper drawings we show the machine box chamfering and planing out of wind; then plain chamfering, jointing and mitering; tapering and hand matching; plain rabbing and rabbing and jointing window blinds; cornering and making rule joints; plowing and gaining; squaring newels and making circular moldings; raising door panels and making waved moldings; rip and cut-off sawing.

Many other varieties of woodwork can be done on these machines, including mortising and boring, and on the 63 the vertical spindle gives still greater range. These machines are really "A Whole Wood Shop in Themselves."

No wood is used in the construction of Fay-Egan woodworkers. They are made of iron and steel throughout and can be transported from job to job without danger of springing or getting the working parts out of alignment.

The carpenter, builder or contractor with a Fay-Egan woodworker in his shop or on the job is practically independent of the planing mill. He gets his millwork when he wants it. Can keep his men busy making up stock on bad days and has the means for working up a profitable business in side lines of furniture, novelties, etc. during the off-season.

More and more are the readers of the AMERICAN CARPENTER AND BUILDER realizing the value of power machines, and they
We are now making the greatest offer of any concern in the building material business. Every carpenter—every contractor—every home-owner in America, who is contemplating early building, should write at once for this greatest of all offers direct from the Gordon Van Tine Co.

We can save you a large amount of money on any building job. In addition to the cash saving, we give you a service far superior to any other building material organization in America. We carry in stock, ready for immediate shipment, anything and everything required to construct any building, large or small. This means not only the regular stock sash, doors and mill work such as are carried in standard sizes by lumber and mill work concerns, but an immense variety of special designs and sizes of mill work and miscellaneous material. Because of our immense volume of business, we are enabled to offer this special millwork at stock prices. This same class of material purchased anywhere else would of necessity have to be made specially to your order. It would, for that reason, cost you double—treble—or in some cases, quadruple, our prices. The proof is yours for the asking.

Write Today for a Copy of Grand Free Mill Work Catalog of Five Thousand Bargains

This big catalog describes accurately and illustrates truthfully our complete line of building material. Gives detailed sizes and descriptions. You can order direct from the catalog with the absolute certainty of getting exactly the sizes, styles and grades specified. It is the connecting link between America's largest independent mill work and lumber concern and the consumer. Our method of doing business entirely eliminates the middle man. The consumer saves the pyramid of profits which would otherwise go to the jobber, wholesaler and retailer.

Guaranteed Building Material at Mill Prices

We guarantee quality, safe delivery, and satisfaction on anything and everything we supply. This guarantee is backed by three big banks. Tens of thousands of satisfied customers throughout the United States will certify to the fact that Gordon-Van Tine Co. absolutely makes good on its guarantee.

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Largest Independent Millwork and Lumber Plant in America

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This trade-mark, "The MARK of the MAKER," is a guarantee of the highest known quality in hand-tools. Always look for it.

What Makes a P. S. & W. Chisel Hold Its Edge?

FIRST—It's the quality of the steel. The blades of these chisels are all forged from solid bars of the best English tool steel.

SECOND—It's the superior hardening and tempering, due to the P. S. & W. knowledge and experience that goes way back to 1819.

THIRD—It's a dozen different points of skill and care possible only to the largest chisel makers of America.

P. S. & W. Guaranteed Tools for Carpenters

Among many other items are Braces, Auger Bits, Chisels, Gouges, Draw Knives, Squares, Pliers, Callipers, Hatchets, Hammers, etc., etc.

Write for a free copy of the "Mechanics' Handy List," a 170 page book, listing over 200 tools and including 35 pages of valuable information for daily use.

The Peck, Stow & Wilcox Co.
MFRS. of the Largest Line of Mechanics' Hand-Tools Offered by Any Maker

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Address 22 Murray St., New York City

A Series of Drawings Showing How Easily Different Kinds of Work Can Be Done on a Fay-Egan Universal Wood Worker

When Writing Advertisers Please Mention the American Carpenter and Builder.
A most wonderful opportunity for a limited and selected number of ambitious men! For over twenty years I have been doing the highest paying expert drafting work. I am Chief Draftsman of a large and well known company. Daily I see the urgent demand for practical, trained draftsmen and I apply my practical method for ambitious men whom I train personally. Each month the demand for practical trained draftsmen is growing.

Get This Valuable Book If You Write to Me AT ONCE FREE!

As Chief Draftsman of a big engineering firm I know exactly the quality and quantity of practical training, knowledge and actual up-to-date experience (not school knowledge) you must have in order to obtain a good position and advance to highest salary. This is NOT a regular correspondence school course. I deal individually with each student and give you individual practical working plans (just as ability and advancement requires) which fit your particular needs. Men who expect to be Superintendents, Mechanics, Engineers—must know practical Drafting as I teach it. What I want is the right kind of men. Don't bother about expense. You can earn big money while learning at home.

Mail Free Coupon NOW!

I will send my book to those who write at once absolutely free—also full particulars about my offer to a few ambitious men who want to make from $2,000 to $5,000 a year. No obligations on you whatever in sending this coupon.

Mail Free Coupon NOW!
Some of the Work Done on a Fay-Egan Woodworker are also becoming more discriminating in their choice. They now demand high grade machinery and quite a number of Fay-Egan woodworkers are now going into their shops.

The Fay-Egan Co. issue special catalogs on woodworkers and we understand a copy will be sent to interested parties free upon request to J. A. Fay & Egan Co., 545-565 W. Front St., Cincinnati, Ohio.

**Simmons’ Catalog**

The Simmons Hardware Co., of St. Louis, Mo., have just completed their 1913 year catalog which has been a stupendous undertaking.

Some idea of the magnitude of the task can be gained from the fact that this edition required eighty-two rolls of paper 45 inches wide, making in all about sixteen carloads. This book contains in the neighborhood of 3000 pages and is a striking monument to the wonderful line carried by the Simmons Hardware Co. Every tool that a carpenter or builder could possibly use is shown in this book, as well as much builders’ hardware of various natures.

Simmons Hardware Co. are jobbers of cutlery and tools and their trade mark “Keen Kutter,” is a well-known symbol for standard quality.

A line addressed to the Simmons Hardware Co., St. Louis, Mo., will bring their catalog of tools which will prove very acceptable to most of our readers.

**A Useful Gauge**

The Warren Supply Company, 85 Warren St., New York City, have produced a special tool that carpenters, builders, cabinet and pattern makers will find most useful in taking reproductions of a moulding, cornice, trim or any irregular curve or surface. It is called the Reinhardt Profile Gauge.

When in use the gauge is placed perpendicularly against the surface to be produced. The rods are pressed with the fingers until an exact profile of the object is obtained. The gauge is then placed on paper and the outline taken with a pencil.

In this manner drawing from sight or memory is done away with and an absolutely correct result procured. The illustration shows pretty clearly what manner of tool this is. It comes in five sizes—from 2 to 6 inches. Every carpenter can afford this little instrument. For further information and prices address the above company.

**CARLOAD PRICES**

**Shingles**

<table>
<thead>
<tr>
<th>Description</th>
<th>Price</th>
<th>per M</th>
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<tbody>
<tr>
<td>Extra “A” Red Cedar Shingles 4 to 2 in.</td>
<td>$1.75</td>
<td></td>
</tr>
<tr>
<td>Extra “Clear” Red Cedar Shingles 5 to 2 in.</td>
<td>$1.35</td>
<td></td>
</tr>
<tr>
<td>No. 1 Common Fir, sized 2x4, 8, 12, 16 ft.</td>
<td>$1.00</td>
<td></td>
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<tr>
<td>2x6 and 2x8, 12, 14, 16 ft.</td>
<td>$1.50</td>
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<td>2x10, 12, 14 and 16 ft.</td>
<td>$1.35</td>
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</tr>
<tr>
<td>2x12, 12, 14 and 16 ft.</td>
<td>$1.35</td>
<td></td>
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<tr>
<td>1x4 or 1x6, 1st Common Fir</td>
<td>$1.00</td>
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</tr>
<tr>
<td>1x6, 1st Common Fir</td>
<td>$1.00</td>
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<tr>
<td>3/4 x 2 Clear and fir. for siding</td>
<td>$0.90</td>
<td></td>
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<tr>
<td>1x4, No. 2 Clear and fir. for ceiling</td>
<td>$0.90</td>
<td></td>
</tr>
<tr>
<td>1x6, No. 2 Clear and fir. for siding</td>
<td>$0.90</td>
<td></td>
</tr>
<tr>
<td>3/4 x 2 fir. for doors</td>
<td>$0.90</td>
<td></td>
</tr>
<tr>
<td>1x4 or 1x6, No. 2 Clear fir. for doors</td>
<td>$0.90</td>
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<tr>
<td>Bevel siding, random lengths</td>
<td>$2.00</td>
<td></td>
</tr>
<tr>
<td>1x4 or 1x6, No. 2 Clear fir. for flooring</td>
<td>$2.50</td>
<td></td>
</tr>
<tr>
<td>1x4 or 1x6, No. 2 Clear fir. for siding</td>
<td>$2.00</td>
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**We Can Save You from $75 to $200 per Car and Guarantee the Quality and Count**

You can actually get as good quality of lumber, shingles, sash, doors, and millwork, grade for grade, from our own mills as you have been buying, for one-third less, provided that you order a carload at a time, (for an average size house), and pay for same upon receipt at your station.

**Read This—We Have Others**

DEAR SIRS:—Find everything O. K. Could not purchase such grades here. Material all nice, straight and clean. Will soon send you another order.

J. O. CUNNINGHAM,
Contractor, Wilson Creek, Wash.

**NEWELL MILL & LUMBER CO.**

8th Ave. So. & Charlestown St.

SEATTLE, WASH.

When Writing Advertisers Please Mention the American Carpenter and Builder.
Backed by our forests and mills
You can underbid everybody

Lumber and millwork are the big items of your bids—we save you 40% to 60%

Backed by such prices you can underbid everybody, locally or otherwise—get more business, make bigger profits—double, treble, yes quadruple your income.

Service for the West
We own thousands upon thousands of acres of choicest Western timber—fir, spruce, hemlock and western soft pine in an almost inexhaustible supply. We own logging camps and railroads. Six great mills convert the timber into lumber and millwork of highest quality. They produce 20 to 30 carloads per day.

Service for the East
We now control two large mills convenient to Eastern shipping points. Our St. Louis mill is equipped to ship cypress, yellow pine and oak finish items, also doors, sash, columns, etc. Our Southern mill in the heart of the celebrated Rose Mary belt, has unequalled facilities for shipping you.

Fir of celebrated quality
Our fir comes from a region famous for big trees and choice timber. It is long and straight, free from large knots and splits. Beautiful in appearance. Wonderfully durable.

Quick delivery everywhere in the U.S.
Prompt shipments We maintain huge stocks at all of our mills. Miles and miles of lumber piles—warehouses, full of millwork of highest quality—await your orders. We fill orders within an average of 24 to 48 hours. Our shipments reach destination within an average of two weeks. You always figure this much in advance.

Unequalled railroad facilities
West From Seattle, seven great transcontinental railroads rush our shipments to all points west of the Mississippi—work delivered within two weeks.

East Our St. Louis and Southern mills, (near Shreveport, La.), offer a similar service to all eastern points. There are twenty-six railroads out of St. Louis, Shreveport has eight, effecting prompt deliveries to eastern points as well as Oklahoma and Texas.

Quality and satisfaction guaranteed
We back every shipment of materials from the west with the guarantee that it will grade better than trust or combine standards. Our yellow pine is manufactured in strict accordance with the Yellow Pine Manufacturers' Association grading rules. The materials we furnish are bound to make a hit with your customers.

Mail coupon for catalog and money-saving price list

Just look at these Prices
F. O. B., Seattle

Shingles—straight car load prices

When Writing Advertisers Please Mention the American Carpenter and Builder.
Take Advantage of This Twentieth Century Improvement in Screen—

You are a progressive man, are naturally quick to take advantage of twentieth century improvements in methods and materials—

Here is just what you have been looking for in a modern wire cloth for door, window and porch screens.

Gilbert & Bennett PEARL Wire Cloth is the name—the genuine article is identified by two copper wires in the selvage.

It is the most beautiful screen imaginable—and the most durable. The very process which gives it its beauty renders it highly weather-proof. In the long run “PEARL” costs much less than cheaper screen.

Gilbert & Bennett PEARL Wire Cloth is permanent and truly economical—the meshes don’t break, separate or offer a lodging place to dust, dirt or germs. It is worthy of your work.

Now, if only for the sake of information—call upon the best hardware dealer in your town and talk to him about “PEARL”—or write our Chicago office for samples and complete book.

The Gilbert & Bennett Mfg. Co.

Established 1818

Chicago  Georgetown, Conn.  New York City  Kansas City

When Writing Advertisers Please Mention the American Carpenter and Builder.

“A Heated Argument”

Figuratively speaking, there are three kinds of furnaces—the “dog in the manger” type, that takes all the fuel you can crowd into its capacious maw and gives nothing in return; the “stingy” kind that takes a lot of coal but gives an inadequate return in heat, and the “good servant” furnace that works night and day, generating heat and cutting down fuel bills until it drives one to open the doors and windows unless its enthusiasm is checked.

Much of the blame attached to furnace heating must necessarily be laid to faulty construction. There are several things that can be considered as contributory causes to insufficient heat being generated; and under this head might come the wrong placing of the furnace or wrong system of piping the heat to the various rooms. It is to be conceded that a great deal of heat is lost through the smoke pipe, as in most furnaces, provision is not made for the burning of combustible gases generated when fuel is consumed. Necessarily the hot smoke and gas must pass up through the flue and waste their heating properties on the outside air.

It seems that the Tubular Heating and Ventilating Company have practically solved the problem of efficient heating with furnaces. By their system, the gases and smoke are passed into the smoke neck and downward into what is called the radiating manifold. Here they are distributed, passing downward through several flues. While traveling through these flues, they lose most of their heat to the air which, rushing in from underneath and passing around the flues, goes into the heating pipes. A peculiar feature of the furnace manufactured by these people is that the smoke pipe is always cool to the touch. These manufacturers call their product the Forbes Furnace and it is highly recommended by the various users throughout the country for its efficiency in heating all styles of residences or stores with a great saving of fuel. The principles on which the Forbes furnace has been manufactured are worthy of our readers’ attention. The illustration herewith will give some idea of the construction used on the Forbes, but in order that the good qualities may be fully appreciated, catalog D, supplied by the Tubular Heating and Ventilating Company, 232 Quarry St., Philadelphia, Pa., should be procured. This will prove interesting reading to those contemplating furnace heating and any of our readers thinking of buying a furnace would do well to investigate this proposition before they place a final order.

A Good Pry Bar

There is a pry bar made by the Sutton Tool Company, Wilkinsonville, Mass., that will prove a welcome addition to the builder’s tool kit. This bar is made from one piece of tool steel carefully forged and hardened. The length is 20 inches and a slot in the blade makes it possible to pull out nails straight as high as a man can reach. It does not “chaw” or split the boards either. For taking up floors, removing scaffolding and other like jobs, the “W. A. Bashaw” pry bar, as it is called, is extremely handy. The Sutton Tool Company are anxious to get in touch with builders so they can tell them about the pry bar. Write for particulars.

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THE KEY HOLE IS IN THE KNOB

of a Corbin Unit Lock. It is shipped from the factory with all parts attached, and the fine adjustments made at the factory are never disturbed. Unequaled for fine buildings of all kinds. Booklet K 15 tells about it. The best dealers sell it.

P. & F. CORBIN
Division
The American Hardware Corporation
NEW BRITAIN, CONN.

When Writing Advertisers Please Mention the American Carpenter and Builder.
How to Lay Out Building Lots or Foundations

Many a builder or farmer has been seriously handicapped in starting work because of inability to lay out building foundations or building lots. The high cost of the engineer's transit has made the purchase of this instrument out of the question. Waiting for a civil engineer to do the job for him has caused annoyance as well as delay. But he can now obtain a relatively inexpensive transit with which he can approach the problem with confidence. Such an instrument as the Starrett, for instance shown in Fig. 1, will enable him to lay out building foundations or building lots and do it at his own convenience.

One of the first things to learn in using the transit is its initial adjustment, that is, making the transit perfectly level. To do this the legs of the instrument are first set into the ground firmly so that the adjustment may not be disturbed. It is then brought to a level by adjusting the lower parts of the extension legs. Greater refinement in level is secured by adjusting the leveling screws between the plate and tripod head. This is done by bringing the level over one of the leveling screws and turning one screw in and another out until the bubble appears in the center of the level glass. Then turn the sight tube or telescope through an angle of about 90 degrees, and again adjust the bubble to the center of the glass. This operation should be continued until the bubble stands in the center of the glass, no matter what direction the level may be turned.

By means of a plumb bob, suspended from the hook under the tripod head, the center of the instrument is set directly over the station mark or corner of the lot, or building to be laid out. The transit is then carefully leveled as above, after which neither the hands or the coat of the operator should be allowed to touch the legs of the instrument.

If $AB$ in Fig. 2 (page 112) represents the street line and the corner of the proposed building is at $C$, which is distant from the street line, $NC$, then a distance $OP$ equal to $NC$ should be measured from the street line at some point $O$ which is at least as far from $N$ as the length of the proposed building. Set a stake at $P$ then the line $CP$ will be parallel with the street. A distance from $C$ in the straight line towards $P$ is next laid off, equal in length to the building or lot; this determines the two front corners $C$ and $D$.

To get the line at right-angles to $CD$, leave the sights still directed on the stake at $P$ and the sight tube clamped by means of the clamp screw and nut. Then turn the graduated arc until the index finger can be passed into the zero mark by means of the push pin. Screw the graduated arc in that position by clamping the lever. Then turn the eye end of the sight-tube or telescope to the left until it has turned a right-angle, or 90 degrees. A sight along its new position will give the line $CF$ on which the required distance is meas-
To give satisfaction, specify enamel that stands up under the cleaning rag. Sounds homely, but it is true. The porcelain-like character of Vitralite, *The Long-Life White Enamel*, sheds dirt, so that it can easily be washed off. Dirt will not be absorbed, nor washed into the finish. Thus it will remain a pure, intense white, through all its long life, unmarred by crack or chip, whether used inside or outside, on wood metal or plaster.

See Pratt & Lambert Specifications, pages 1842-1843, 1913 Sweet’s Index, before specifying wood finishes.

Pratt & Lambert-Inc., 110 Tonawanda Street, Buffalo, N. Y.

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When Writing Advertisers Please Mention the American Carpenter and Builder.
Birch Finish

Residence of W. T. Christine, Glen Ellyn, Ill.
J. E. Minott, Aurora, Ill., Architect.

BIRCH solves the perplexing problem of how to get the best interior finish at the least expense. The owner of the attractive cottage shown above says:

"I do not believe any house ever was more highly and generally complimented than ours, and particularly does the Birch Trim, finished in natural color, win praise from those who see it. The house is trimmed throughout in Birch except two rooms. Stairway is Birch, treads, risers, balusters, rails and newel posts."

BIRCH is a close-grained, wear-resisting, hard, wood that does not warp, shrink, nor mar easily like softer woods. It has a peculiar richness of tone and figure and takes readily and permanently a wide variety of stains. Birch is so adaptable and serviceable that it can be used throughout the house from kitchen to sleeping rooms for doors, casing, base, trim and floors with excellent effect, while the cost is so reasonable that to specify Birch is true economy.

Our illustrated Birch Book "C," which shows how Birch is used in modern homes, apartments, and office buildings, together with a sample of Birch in stained and natural colors will be sent postpaid to any reader of this magazine.

The Northern Hemlock and Hardwood Manufacturers Association
Dept. C
Wausau, Wisconsin

When Writing Advertisers Please Mention the American Carpenter and Builder.
### Facts About Quality, Sizes and Grades

**CONCERNING QUALITY.** It is well known that quality lumber is a wise investment, for it is very superior in strength and lasting qualities to other woods such as hemlock, tamarack, jack pine, etc. Cypress lumber is always cut, dried and matched. Cypress is a well known fact among contracting concerns and architects that cypress lumber for cornice work, finishing lumber and bevel siding, and paneling is superior to any other wood. It is very superior in strength and lasting qualities to other woods such as hemlock, tamarack, jack pine, etc. Cypress lumber is always cut, dried and matched.

**CONCERNING SIZES.** The sizes specified on this and the preceding pages are those of the standard or regular Association Bordering flooring, siding, ceiling, partition, shiplap, dressed and matched, and should be ordered only for that purpose. The sizes are always cut, dried and matched.

### CYPRESS BARN BOARDS.

**Strictly No. 1 Selected Stock. Surfaced Both Sides.**

Be sure to give the order number. All stock furnished, lumber and matched, and unsurfaced. Mark your order. Lumber Dept., 56-A. The 1 grade is the lowest grade we handle, and is made from thoroughly kiln dried stock. It is used for low priced buildings. Mark your order. Lumber Dept., 56-A.

### SIZES.

**LATH.** CYPRESS AND YELLOW PINE. Thoroughly dry. All 5/4 inch thick, 1 1/4 inches wide.

<table>
<thead>
<tr>
<th>Length</th>
<th>Grade</th>
<th>Wood</th>
<th>Price</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yel. Pine</td>
<td>1</td>
<td>3 1/4</td>
<td>500 lbs.</td>
<td>1,000 lbs.</td>
</tr>
<tr>
<td>Yel. Pine</td>
<td>2</td>
<td>500 lbs.</td>
<td>1,000 lbs.</td>
<td></td>
</tr>
<tr>
<td>Cypress</td>
<td>1</td>
<td>500 lbs.</td>
<td>1,000 lbs.</td>
<td></td>
</tr>
<tr>
<td>Cypress</td>
<td>2</td>
<td>500 lbs.</td>
<td>1,000 lbs.</td>
<td></td>
</tr>
</tbody>
</table>

**SHINGLE LATH, CHING STRIPS AND GROUNDS, AND BRIDGING.**

Surfaced two sides and made from sound stock suitable for the purpose intended.

**BRIDGING, YELLOW PINE. (Square Ends.)**

<table>
<thead>
<tr>
<th>Size</th>
<th>Price, per 100</th>
<th>Weight, per 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>1x2</td>
<td>45¢</td>
<td>45 lbs.</td>
</tr>
<tr>
<td>2x2</td>
<td>55¢</td>
<td>55 lbs.</td>
</tr>
</tbody>
</table>

**DIMENSIONS SHINGLES. RED CEDAR.**

5 inches wide. 16 inches long. Furnished in six different designs.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Price, per 1,000</th>
<th>Weight, per 1,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear</td>
<td>$3.65</td>
<td>360 lbs.</td>
</tr>
<tr>
<td>Star A</td>
<td>$3.85</td>
<td>380 lbs.</td>
</tr>
<tr>
<td>Extra Clear</td>
<td>$3.70</td>
<td>370 lbs.</td>
</tr>
<tr>
<td>Prime</td>
<td>$3.70</td>
<td>370 lbs.</td>
</tr>
</tbody>
</table>

**SHINGLES.** RED CEDAR AND CYPRESS.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Kind of Wood</th>
<th>Price, per 100</th>
<th>Weight, per 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Star A</td>
<td>Red Cedar</td>
<td>$3.65</td>
<td>360 lbs.</td>
</tr>
<tr>
<td>Extra Clear</td>
<td>Red Cedar</td>
<td>$3.85</td>
<td>380 lbs.</td>
</tr>
<tr>
<td>Prime</td>
<td>Cypress</td>
<td>$3.70</td>
<td>370 lbs.</td>
</tr>
</tbody>
</table>

**DIMENSION SHINGLES. RED CEDAR.**

<table>
<thead>
<tr>
<th>Size</th>
<th>Price, per 100</th>
<th>Weight, per 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear</td>
<td>$3.65</td>
<td>360 lbs.</td>
</tr>
</tbody>
</table>

**BARN BATTENS.**

<table>
<thead>
<tr>
<th>Size</th>
<th>Kind Wood</th>
<th>Price, per 100</th>
<th>Weight, per 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>1x4</td>
<td>Cypress</td>
<td>$2.00</td>
<td>20 lbs.</td>
</tr>
<tr>
<td>1x4</td>
<td>Yellow Pine</td>
<td>$2.00</td>
<td>20 lbs.</td>
</tr>
</tbody>
</table>

**PRICES.**

Our Select grade finishing lumber is the next grade above the clear and will be furnished and ordered which will be covered with paint. This is the grade usually used for outside finishing lumber.

No. 1 grade dimension and timbers are all sound, straight, white, and very sound; furnished; one inch, furnished, and better than average, are furnished and furnished. Our No. 2 and No. 3 grade timbers, boards, and lumber are all sound, straight, and should be ordered only for the lowest class of work.

Our No. 2 grade boards, sheathing, and shingles are good serviceable stock, and are furnished in the grade in which lumber is manufactured, and this grade is recommended for the best class of work.

Our No. 3 grade boards, sheathing, and shingles are good serviceable stock, and are furnished in the grade in which lumber is manufactured, and this grade is recommended for the best class of work.

Our No. 2 and No. 3 grade timbers, boards, and lumber are all sound, straight, and should be ordered only for low priced construction.

Order lumber to allow for shingling or matching.

**DIMENSION.**

Yellow Pine.

<table>
<thead>
<tr>
<th>Size</th>
<th>Length</th>
<th>Grade</th>
<th>Price, per 100</th>
<th>Weight, per 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>1x2</td>
<td>15</td>
<td>1</td>
<td>$3.65</td>
<td>360 lbs.</td>
</tr>
<tr>
<td>1x2</td>
<td>15</td>
<td>2</td>
<td>500 lbs.</td>
<td>1,000 lbs.</td>
</tr>
<tr>
<td>1x2</td>
<td>15</td>
<td>3</td>
<td>500 lbs.</td>
<td>1,000 lbs.</td>
</tr>
</tbody>
</table>

**SHINGLES.**

<table>
<thead>
<tr>
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<th>Kind of Wood</th>
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<tbody>
<tr>
<td>Star A</td>
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<td>$3.65</td>
<td>360 lbs.</td>
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<tr>
<td>Extra Clear</td>
<td>Red Cedar</td>
<td>$3.85</td>
<td>380 lbs.</td>
</tr>
<tr>
<td>Prime</td>
<td>Cypress</td>
<td>$3.70</td>
<td>370 lbs.</td>
</tr>
</tbody>
</table>

**BARN BATTENS.**

<table>
<thead>
<tr>
<th>Size</th>
<th>Kind Wood</th>
<th>Price, per 100</th>
<th>Weight, per 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>3x6</td>
<td>Cypress</td>
<td>$3.50</td>
<td>35 lbs.</td>
</tr>
<tr>
<td>3x6</td>
<td>Yellow Pine</td>
<td>$3.50</td>
<td>35 lbs.</td>
</tr>
</tbody>
</table>

**DIMENSION.**

<table>
<thead>
<tr>
<th>Size</th>
<th>Length</th>
<th>Grade</th>
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</thead>
<tbody>
<tr>
<td>1x2</td>
<td>15</td>
<td>1</td>
<td>$3.65</td>
<td>360 lbs.</td>
</tr>
<tr>
<td>1x2</td>
<td>15</td>
<td>2</td>
<td>500 lbs.</td>
<td>1,000 lbs.</td>
</tr>
<tr>
<td>1x2</td>
<td>15</td>
<td>3</td>
<td>500 lbs.</td>
<td>1,000 lbs.</td>
</tr>
</tbody>
</table>
The Lock-Joint Column

Columns both for inside and outside decoration of buildings are accorded more favor year by year. They lend a certain stateliness and dignity which no other mill work offers. Columns for buildings have been used since the earliest recollection of man and even in this advanced age our designs are reproductions of those made by the ancients.

In their product the Rudolph Hegener Co. have followed the standard designs very closely and their columns deserve commendation from the standpoints of art and utility. This company employ a special patented lock-joint feature. This is said to prevent absolutely the column from spreading, warping or springing. All sizes from the smallest to the largest are made.

We cannot begin to describe the many features of Hegener columns and capitals. Nicely illustrated booklets and price lists can be had by addressing Rudolph Hegener Co., 932 Harbor Ave., Chicago, Illinois. We suggest that our readers get these books which will always prove a handy reference either when making estimates or buying columns.

Hess Furnaces Improved

In every issue of this paper, since the beginning, the Hess Warming & Ventilating Company have advertised their steel furnaces, and later, their white steel medicine cabinets.

The company are grateful to hundreds of our subscribers for their liberal purchases of heaters and cabinets.

The Hess Steel Furnace for 1913 is better than ever. An important concession to buyers is offered, in the supplying of the “extra heavy” steel radiators, in place of the “standard” weight used for so many years, without increasing the price.

This is made possible by procuring extra large plates from the mills, and forming the corners, thus saving the cost of welding smaller plates together, the saving in cost of welding equaling the increased expense of heavier metal.

The welding of all seams in the Hess furnace makes leakage of gas and dust permanently impossible, while its power and fuel economy have pleased thousands of customers.

In spite of the repeated advances in the cost of steel and...
LIVE CARPENTERS ARE GETTING onto the CYPRESS BAND-WAGON!

READ EVERY WORD of the UP-TO-DATE LETTER BELOW

We’re glad they’re taking advantage of our facilities and we’re glad they respond to our helpful intentions. No other lumber manufacturers are doing much to help the people whose use of their particular kind of wood constitutes their market—are they? The Cypress people are “friends to their friends,” just as Cypress itself is the best lumber friend of the man who cares what permanent value he gets for his lumber money.

AND IT’S ONE OF THE EASIEST WOODS KNOWN ON EDGE TOOLS

A BIG LESSON FROM A LITTLE DAHLIA STAKE. READ IT:

Feb. 17, 1913

Southern Cypress Manufacturer’s Association.

Dear Sirs: I received Vol. 28 of your Cypress Pocket Library and was very much pleased with it. Intend to build from some of those designs this spring and of course will use Cypress. My attention was first drawn to Cypress several years ago by using some of it for Dahlia stakes along with some pine, etc., and after the pine had rotted away THE CYPRESS SHOWED NO SIGNS OF DECAY. Since then I have used it for boats and canoes and it has been very satisfactory. Would like you to send me the following volumes and hope and expect to profit by same.

I THINK YOUR PLAN OF SENDING OUT THESE BOOKLETS A GOOD ONE, AS IT ENABLES ONE TO PLAN AND PROFIT BY EXPERT OPINION.

BEING A CARPENTER I AM FREQUENTLY CALLED ON TO BUILD TRELLISES, PERGOLAS, ARBORS, ETC.

Please send me the following volumes of your Cypress Pocket Library: 3, 6, 7, 19, 28, 30 and 33.

Yours truly, (Signed) C. E. ROBBINS.

4 Vanden Bosch Ave., Auburn, N. Y.

CARPENTERS AND BUILDERS ARE WELCOME TO THE BEST WE HAVE. GET YOURS!

WRITE TODAY for VOLUME ONE of the CYPRESS POCKET LIBRARY, with Full Text of OFFICIAL U. S. GOVT. REPT. Also Full List of 35 Other Volumes. (FREE on request.)

Let our “BUILDERS’ DEPARTMENT” help YOU. Our entire resources are at your service with Reliable Counsel.

SOUTHERN CYPRESS MANUFACTURERS’ ASSOCIATION

1216 HIBERNIA BANK BUILDING, NEW ORLEANS, LA.

INSIST ON CYPRESS AT YOUR LOCAL DEALER’S. IF HE HASN’T IT, LET US KNOW IMMEDIATELY.

When Writing Advertisers Please Mention the American Carpenter and Builder.
End Your Column Troubles Forever by Using UNION METAL COLUMNS

They are made of steel and cast iron and are therefore free from the many serious faults so common to wooden columns, such as opening of glued joints, splitting, warping, rotting, etc., etc.

Furthermore they are incomparably superior in appearance because they are made over accurate patterns and dies, and are therefore perfectly true and all lines are sharp and clean cut.

Building experts in all parts of the country recognize their durable, ornamental and all around practical qualities, and are accordingly using them more and more.

Union Metal Columns are absolutely practical for any structure where columns are required regardless of size.

The outside of the shaft is smooth and perfectly symmetrical, and is coated with a high class paint that will adhere to the steel, being prepared for just this purpose.

Union Metal Columns are the product of a wide experience, and scientific research, and are in no sense experimental, but to the contrary are in actual use on all kinds of buildings both small and large, humble and magnificent, throughout the United States and foreign countries.

They outlast any other column except those made from marble or granite and are low priced.

We make them in all sizes. We want reliable, active agents.

Mail the coupon for catalogs.

THE UNION METAL MFG. CO.
Canton, Ohio
SOLE MANUFACTURERS

COUPON
The Union Metal Mfg. Co., Canton, Ohio.
Gentlemen:—Please send me free of charge all literature bearing on your Union Metal Columns
Yours truly,
Name
Address
Town and State

When Writing Advertisers Please Mention the American Carpenter and Builder.

other materials used in making the Hess furnace, prices have not been raised, but an increase in price will be made May 1st.

All who will need furnaces this season, therefore, are invited to send plans for estimates in time to secure the present low rates.

Hess Steel White Enamelled Medicine Cabinets are in great demand. They are beautiful goods, nice enough for the finest bathrooms, and cheaper than wood of equal finish.

The Hess Warming & Ventilating Company, 920 Tacoma Bldg., Chicago, supply free booklets on request.

An Architect's View

Below is a letter received by Franklyn R. Muller & Co., 316 N. May street, manufacturers of Asbestone, the sanitary flooring material which is receiving such well deserved recognition among architects and builders.

Chicago, Ill., Feb. 20, 1913.

Gentlemen: I want to express my satisfaction and appreciation for your personal attention and prompt execution of your last work done for me, namely, the Asbestone floors of the auditorium, balcony, foyers and stairs of the Lincoln Theatre Building.

I do not have to mention the quality of your work, as I think the Asbestone floor equal, if not better, than any other magnesite floor on the market, which I know from actual experience.

I have used the Asbestone quite extensively for stair treads, applying same 1/4 inch thick on steel plate sub-treads, and have found them very satisfactory.

I can highly recommend your floor to anyone as a sanitary, durable and noiseless floor. Yours very truly,

(Signed) ROBERT C. BERLIN, Architect.

A Square Business Man

One of your friends came into the office the other day and we had a very interesting talk with him. Mr. S. F. Ferguson of Danville, Ill. He is a well-known dealer in new and second-hand builders’ machinery.

We were greatly impressed with Mr. Ferguson’s ideas of how to conduct business along successful lines. He has found that the old saying, “Honesty is the best policy,” is about the best motto a business man can follow. It seems that Mr. Ferguson is very progressive and at the same time, has sufficient reverence for old-time business methods to combine them with the present-day usages. Among other things he said, “I believe in giving every man a square deal. Whatever goods I advertise are exactly as I represent them to be. If they are not, I give my customers full privilege of returning the machines at my expense. I built up a reputation for integrity in business dealings that I wouldn’t sacrifice for many thousands of dollars and I find that when I have once made a sale to a customer, he always remains one of my friends.”

This looks to us as though Mr. Ferguson’s success is justified and will continue so long as he follows these methods. He does a big business in concrete mixers, builders’ hoists, molds, forms, hoovers, cars, dump wagons engines and any other kind of machinery that a builder or contractor uses.

When Mr. Ferguson left, he placed on our desk a number of his circulars and his latest catalog which show in a very
It is a proven fact that MOORE'S FURNACE is so constructed that it saves fuel and keeps the house warm in any weather. You get more heat per pound of coal out of MOORE'S FURNACE than from any other make. The reason for more heat is

**Larger and Better Radiating Surface**

The sides of the heating dome are practically straight and heavily corrugated. The radiator is extra large in diameter and the bottom is slanted upward and inward to throw the in-rushing air thru the central chamber and around the radiator dome.

**Moore's Everlasting Fire Pot Saves \(1/3\) to \(1/2\) Fuel**

Because it burns the gas, the smoke and the soot, and makes soft coal equal in heating value to hard coal. The air is admitted thru the flues, and the fuel burns from the sides toward the center, allowing unrestricted radiation thru the fire pot.

**Built Entirely of Cast Iron**

The most durable of all constructions. Goes together easily. All parts are fitted together before being shipped.

**Our Free Book on Furnace Information**

Will give you a lot of facts about furnace heating. Send for it, and see why you should specify Moore's Furnace in your heating contract. Fill out the coupon today and get that book.

**MOORE BROS. COMPANY**

**JOLIET ILLINOIS**

When Writing Advertisers Please Mention the American Carpenter and Builder.
thorough manner the machines in which he deals. It is our opinion that anyone desiring information as to the kind of a machine to purchase, will be rewarded by having Mr. Ferguson send them the catalog. Address S. F. Ferguson & Co., Danville, Ill., and without doubt you will be treated very courteously.

**"The General" Offers a Specification Roof**

Those who have used “Certain-teed” ready roofing will be glad to know that its makers, the General Roofing Mfg. Co., have now entered the specification roofing field. It is expected that “Certain-teed Specifications” will revolutionize the built-up specification roofing trade the same as “Certain-teed” ready roofing has the role roofing business.

This is a built-up roof that is destined to rapidly replace the old style coal tar and gravel roofs on skyscrapers, factories, store buildings, apartments, and theatres—or any buildings with large surfaces where conditions are unusually severe, and the greatest durability is necessary. This method of construction no longer makes the use of smoky, hot tar kettle necessary, because “Certain-teed Specification” roofing is laid with cold liquid “Certain-teed Cement.”

Mr. S. S. Cunning, president of the General Weatherproofing Co., of St. Louis, and in charge of the Specification Roofing work for the General Roofing Mfg. Co., describes the situation as follows:

“The prime factors of any building material are its suitability and durability. We have made wonderful strides in building construction. Sanitary, fireproof, every known convenience goes into them. Still we have been content with covering our roof decks with a material that has grown less in value as time progresses.

“Have we looked into the question and do we know the difference between coal tar and asphalt? Coal tar, the by-product of gas works and coke ovens, once a gas, still retains much of its gaseous nature and at low temperatures volatilizes and reverts into its former self, and is lost. Can such material be counted as permanent when used in roofing? Why are tar and tar products inferior today? One chief reason is that perhaps 85 per cent of the tar produced in cities is the by-product of gas works producing fuel and illuminating gas by the “Water Gas” method.

“It is the admixture of the tar residues and the petroleum residues as they come from the water gas plant, that gives the producer under this method, his greatest trouble. It is absolutely impossible to control results.

“While some of the light constituents of tar make good fluxes for petroleum bases, petroleum oils are poor fluxes for tar residues and act as precipitants of these bases.
Be far-sighted — look beyond first cost

Don't pay for "hind-sight" by being near-sighted in selecting your roofing. There are just three classes from which to choose:

1—Low first cost and high final cost.

The price is cheap. The roofing looks pretty good—on the surface. But the construction is weak—the material shortly dries out and cracks—and the joining of laid sheets is unprotected. The unending expense of upkeep makes its final cost high.

2—Fair first cost and uncertain final cost.

This class of roofing is made of excellent materials, and looks attractive. But it hasn't the necessary tensile strength—and the joining of laid sheets is unprotected. This roofing's life and cost of upkeep is uncertain.

3—Fair first cost and low final cost.

The strength of Carey Roofing's construction are compressed in one indivisible sheet, at the factory.

Here is how it is made: First a foundation layer of heavy woolen felt. On this is laid the body, a heavy layer of live flexible asphalt cement. To protect and give tensile strength to the body, a layer of strong Calcutta burlap is imbedded in it. This layer is in turn protected and preserved by a layer of special asphalt composition. All these layers are compressed in one indivisible sheet, at the factory.

When these sheets are laid on the roof, the joining edges are first nailed down. Then the Carey Patent Lap, an extension of the burlap layer, is cemented down over the nails and joins. A final coat is then spread over the whole roof. There are no weak spots. Your building has a weather-tight roofing that will give certain and permanent service, at low cost.

Write for generous sample and complete information. You can arrange with nearest dealer to see Carey roofs in service—let us prove good service.

THE PHILIP CAREY COMPANY
58 Wayne Avenue, Lockland
Cincinnati, Ohio

When Writing Advertisers Please Mention the American Carpenter and Builder.
A Genuine Illinois Watch $13.75

I have decided to make carpenters and readers of American Carpenter and Builder this watch offer that is the sensation of the watch trade. I have enough of these superb watches to satisfy all who order promptly. Don't wait until the day the offer closes.

Here's the chance for every carpenter and builder, no matter what his income or financial condition may be, to own a really fine timepiece. Think of a genuine "Illinois," made by the Illinois Watch Co., of Springfield, Ill. 17-jewel movement, 20-year gold-filled case and only $13.75, on easy credit terms of $1 a month.

Guaranteed 25 Years. We send you a certificate with this watch that positively guarantees it for 25 years' service. Think of a watch sold for only $13.75, on easy credit terms of $1 a month. It is warranted for 20 years. Being screw back and bezel, it is dust-proof.

17 Fine Jewels, type known. Containing 17 jewels, which means perfect running qualities. Will give as good service as the highest priced watch.

20-Year Gold-Filled Case is a beauty, made in openface style, with handsomely engraved back. It is warranted for 20 years. Being screw back and bezel, it is dust-proof.

Big Jewelry Book FREE

In our special jewelry catalog are many other styles and sizes of high grade watches, also some wonderful diamond and jewelry values, all sold on credit. You should have this book, because we can save you money on all jewelry.

Tear Off This Blank and Mail

NOT GOOD AFTER MAY 15th

SPIEGEL, MAY, STERN CO., 3523 Wall Street, Chicago.

I enclose first payment of $1.00, for which send express paid, the 17-jewel Illinois Watch No. X1276, described in your advertisement. If I keep it I will pay $1 each month until $13.75 has been paid. If I return it within the 30-day trial period you are to send me back my $1.

Name

Postoffice

St. or Box No. State

CHICAGO

When Writing Advertisers Please Mention the American Carpenter and Builder.

with a formation of a crumbly, nonadhesive mass. There was a time when a gravel roofer guaranteed his roof for a long period. Why is he fighting now to reduce the guarantee? And many contend they should not be asked to guarantee at all. From one standpoint their contention has merit, but only from the standpoint of "comparison." Other trades are not called on to give any such surety covering their work.

"This is the sole contention of the roofer. Now, from the owner's standpoint. He is the man who pays the bill, the 'ultimate consumer' that the economist is striving to assist and protect, and it is the duty of the architect and contractor to assist him in the fullest; which the former can do first by specifying a roof of that known worth backed by the guarantee of the manufacturer and applied by a reputable contractor, one the manufacturer has confidence enough in to join in with him in the guarantee.

"Let us go into cost and maintenance figures. Your tar and gravel roofs cost $X per square, and are guaranteed for five years. About that time, connections at fire walls and openings begin to break and a coating of pitch is applied at a cost of, say $AA a square, which is supposed to carry the roof three or four more years. At ten years utmost, the roof must be recovered and the renewal cost is 25 to 30 per cent more than the initial cost of the roof.

"All this while the owner has maintained at heavy expense, gutters and downspouts worn out by the action of tar acids and gravel and dirt slipping in them.

"How can all this undue worry and expense be overcome? "A 'Certain-teed Specification' roof is a built-up-on-the-roof asphalt roof constructed of layers of 'Certain-teed' roofing cemented with cold liquid 'Certain-teed' cement. This does not require coating or painting and the maker joins with the roofing contractor in a 15 years' guarantee. That is a long time we know, but the manufacturer of the material entering into this roof, has had a quarter of a century of actual experience in mining, milling and blending the mineral asphalt and mineral asphalt oils which he uses as saturants of his felts and in his coatings and cement. Asphalt, never
Before you decide for or against Certain-teed Specification Roofing—
get our book "A Mass of Evidence" FREE

Remember, we do not ask you to take our word alone—or the word of any one builder or contractor.

All we ask is that you investigate for yourself.

Upon request, we will place in your hands a book containing such a mass of evidence in favor of Certain-teed Specification Roofing that you will find your doubts, your prejudices, your misgivings, if you have any, fading like mist before the bright morning sun.

A limited edition of this book has been printed for distribution among Architects, Contractors and Builders.

It is the most complete book of its kind ever published—it contains actual photographs of skyscrapers, apartments, warehouses, factories, depots, banks, livery barns, college buildings, hospitals—any and all kinds of buildings covered with Certain-teed Specification Roofing—all illustrations are reproduced from actual photographs—and the camera cannot lie.

Detailed Specifications free upon application

Detailed Specifications for applying Certain-teed Specification Roofing over concrete or board sheathing will be furnished free to Architects, Contractors, Builders and Carpenters.

So write us today for our book "A Mass of Evidence," illustrating methods adapted by leading architects and engineers for the application of roofing, water proofing and insulation materials.

In writing, also ask for a copy of our book "Modern Building Ideas and Plans"—you will find it useful in your business.

You simply cannot afford to miss this opportunity to get these two valuable books—so let us hear from you by return mail. In doing so you promise nothing—obligate yourself in no way.


Manufacturers of Certain-teed Shingles and Roll Roofing

Certain-teed Specification Roofing is rapidly replacing the old style coal tar and gravel roofs—no hot tar, gravel or slag used.
A Ventilated Store Front

The value of a good window display in any store cannot be overestimated. It is the best advertising medium any store-keeper has, but if a display in the window is obscured from the view of passersby, either through an accumulation of frost or moisture on the window panes, the advertising value of the display is lost. No matter what business a man is in, if he has the opportunity to display his wares in the window, he should do it, and at the same time he should see that the display is kept clean and bright-looking at all times.

This is not always possible when the ordinary store front is used and many a business has been ruined by a badly constructed store front. In placing their ventilated store fronts before the builders, Love Bros., of Aurora, Illinois, have brought forward something that is very valuable. These fronts are made of special graded iron and steel, which is warranted not to rust or corrode. The method of construction is such that the danger of breakage to the glass is reduced to a minimum and in case such breakage does occur, the glass can be replaced very easily. Their system of ventilation of the store front is unique, insofar as constant circulation of fresh air behind the glass is kept up by means of vents at the bottom and top of the window. This does away with the necessity of a store keeper running an electric fan in the window to keep the glass dried off. The expense of running such a fan throughout the winter months is considerable.

These iron fronts form a delightful and artistic addition to any store building and give the store keeper full reign in the matter of making an attractive display without the danger of its being hidden. They are practically indestructible, standing the test of time, weather and fire favorably. They can be installed in any building new or old. Love Bros., being engineers, founders and machinists, handle a wide line of material. They manufacture iron fencing, stairs, railing, grilles, fire-escapes, side-walk lights, furnaces, etc. They maintain an efficiency department with the object of helping all carpenters and builders who experience any difficulty in the matter of installing store fronts. Any questions which confront the carpenter or builder are quickly settled in a satisfactory manner by consulting Love Bros., Aurora, Ill.

Their catalog is one of the handsomest we have seen in a

Modern Store Front That Won't Frost Over

50c SAVES YOU $300.00

I have done it for others and can do it for you. Each foot of floor space in every home you build costs on an average of $3.50. My way of saving floor space saves you money.

The "New Way" Wardrobe is an honest proposition that will be more widely used each year. It is here to stay. If it wasn't a fair method I wouldn't have anything to do with it.

My "New Way Home" Plan Book contains the latest designs for homes, ranging from $1200.00 to $12,000.00, planned with the "New Way" Wardrobes. It is a mass of valuable information for every carpenter and builder. It shows the "New Way" to build a home and save $550.00 on a $3,600 residence. You don't have to make your building larger to have "New Way" Wardrobes. They are built in flush and save more than half the floor space usually devoted to old-fashioned, dark, dusty and inconvenient clothes closets. And they are not an extra expense.

I want you to have my "New Way Home" Plan Book, for it will give you new and progressive ideas. If you decide to install the "New Way" Wardrobes, my architectural department will help you in every possible way.

Send 50 cents now for the Plan Book, which will be sent at once by mail.

JOHN THOMAS BATTs

Room 611 Architectural Department
GRAND RAPIDS, MICHIGAN

When Writing Advertisers Please Mention the American Carpenter and Builder.
Bestwall

A

FIREPROOF WALL BOARD

It Will Not WARP, EXPAND or CONTRACT

The MOST SATISFACTORY WALL BOARD
ANYONE Can Put It Up QUICKLY and EASILY

Bestwall is NOT a Paper Board—It is a MINERAL COMPOSITION

Bestwall Boards are made in convenient sizes to secure most artistic panel effects. If you do not wish to panel the walls you can apply wall paper or washable paint directly on the surface without the use of strips over the joints. This cannot be done successfully with any other wall board.

Nail it directly to the Studding—Makes the Best Wall

You have a Finished Wall as Soon as it is nailed in place. No waiting for plaster to dry. You can occupy your house at once without danger to health.

We make a special crack filler for the joints so that a wall can be finished ready to decorate. There is no expansion or contraction to “Bestwall,” therefore there will be no cracking at the joints

Write to Us For Sample and Particulars About BESTWALL and Its Uses

BESTWALL MANUFACTURING CO. Chicago, Illinois

When Writing Advertisers Please Mention the American Carpenter and Builder.
Carpenters and Builders.—Here’s the question which will be brought home to millions of April periodical readers:

“How much did you pay for coal last winter? Figure it up—then divide the amount by two or even three; that will give the cost for next winter, provided you put in an Underfeed—either Warm Air Furnace or Steam or Hot Water Boiler. And the difference saved will soon pay for the Underfeed.”

You, too, are vitally interested in the proper heating of any house you erect. The Underfeed is the most economical heater on the market—the heater that adds to the renting or selling value of any building.

Send for our FREE Book and we will convince you as we have thousands of others.

The Peck-Williamson Furnaces

"The House Beautiful" in a recent article on heating equipment, asserts: "Underfeed furnaces are growing in popularity, for in firepots of this sort, fuel is consumed more scientifically and the utmost heat is produced.

Economy and Efficiency are Underfeed certainties in both Furnaces and Boilers.

Four Big Savings

are insured by the Underfeed way of burning coal.

1. Cheaper grades of hard or soft coal, slack, pea or buckwheat sizes are pumped into the firepot from below, and yield in the Underfeed more clean, even heat than highest priced coal burned in the ordinary way.

2. Smoke and gases (25% to 40% heat value of coal) wasted up chimneys of other heaters, must pass through the flames, are consumed and make more heat.

3. In the Underfeed the fire glow plays upon heat-responsive, clean metal, because heating surfaces are always kept clean; in other heaters, the fire glow is upon soot-covered surfaces, which retard heat.

4. Instead of being blanketed under fresh coal, live coals are always on top, close to the heating surfaces. This explains the even Underfeed temperature, while top heaters invariably show less heat after fresh coal is added.

Underfeed Heaters are Adapted for All Buildings—Large or Small

Installed in unit or battery form in apartment houses, halls, churches, theaters, schools, etc.

Send us your building plans and we will furnish free engineering plans, actual cost of installation, and tell you where you can get your Underfeed.

It will add to your reputation as a builder of always comfortable houses to specify the Underfeed.

The Peck-Williamson CO.

436 W. Fifth Street  Cincinnati, Ohio.

long time and we suggest it as being a desirable one for our readers. In our opinion, you will be well repaid by writing for it.

Modern Millwork

The business of the Huber Builders’ Material Company, 4549 Vine Street, Cincinnati, Ohio, has shown the most gratifying increase during the past year, their customers in the south and southeast having sent in an unusually large number of orders. One of the advantages of dealing with them is the fact that in so doing you can get practically all the building material, including millwork, hardware, paint, etc., in one order, thus saving time and cost of transportation.

The Huber Builders’ Material Company are showing in their latest catalog unusual values in mantels, porch columns, general millwork and art glass doors. They are also agents for Bestwall Board, rolling partitions, etc.

Mr. Harry A. Huber, whose picture appears herewith, has had a wide experience in this particular field. It is owing to his personal push and initiative that the firm has advanced as it has. In their latest catalog, which will be sent to our readers on request, they have adopted the slogan “To Huberize Is to Economize.”

Griswold’s Adjustable Roofing Bracket

An adjustable roofing bracket which carpenters and builders are likely to find of advantage when shingling a roof is illustrated. The bracket fastens on three courses of shingles and is locked to two shingles on the roof so that it cannot be accidentally removed. The bracket is made of steel, is light in weight and folds into small space for packing. The illustration shows two brackets in place upon a roof, but each being at a different angle from the other for the purpose of indicating the variations permissible. The small view at the top of the picture shows the appearance of the bracket when folded. The bracket is made by W. S. Griswold, 37 John Street, Springfield, Mass., who points out that it is of great convenience when working around dormer windows, skylights and on piazza roofs as the bracket can be adjusted to any pitch of roof in an instant and gives a staging 14 in. wide on which to work if desired.
We Secure Contracts for You

by keeping constantly in touch with people needing and using silos. Every inquiry from your territory is turned over to you. You fill the demand. You get the profits. Monsco Reinforced Monolithic Silos are endorsed by the Universities of Illinois and Wisconsin. We positively place you in a position to build monolithic silos in the quickest and most economical way. Read every word of this advertisement. It contains a particular message for you contractors.

Monsco Silo Equipment

consists of scaffold-hoist and Monsco forms. The contractor does not use timbering of any kind. The forms are made in two circles each 3 feet high and divided into segments to permit easy handling. You pour 6 feet of wall, including chute, per day; 3 feet in the morning and 3 feet in the afternoon. Reinforcement and ladder rungs are installed at the same time. The walls are 6 inches thick and do not vary. You can build a complete 16x41 monolithic reinforced concrete silo in nine days by using Monsco equipment.

Guaranteed 5 Years

Monsco Silos are no experiment. We have built hundreds and have guaranteed them against cracks or defects for a period of 5 years. Monsco Equipment has been thoroughly tested before being offered to you. It is worthy of your confidence.

A Contractors Proposition

Our wide-spread advertising gets us inquiries and contracts from farmers all over the country. We turn these over to you. You do the work. You get the big profits. Even if you have never built silos, you can build perfect ones by using Monsco equipment and following the book of copyrighted instructions we furnish free.

Your interests are involved. Get our Free Book of Information on Monsco Silos and Monsco Equipment. Think how we co-operate with the builder; think how we'll help you to get the business and money and write at once for full information. The price of a stamp will tell you how to make hundreds of dollars this season. Don't delay. Write now.

Monolithic Silo & Construction Co.
870 Peoples Gas Building
Chicago, Illinois

When Writing Advertisers Please Mention the American Carpenter and Builder.
With this machine on the job, you can not only cut, match and bore the lumber for your concrete building forms, but you can handle the wood finish and trim as well.

For the "American" is a simple, sturdy, reliable little planing mill that you can take from job to job, right on the work—at a price that brings it within the reach of every contractor.

In the "American" Wood-Worker you really get three distinct machines—each capable of a great variety of work—each independent of the other—each so arranged that a man can work on it without interfering with the men on the other two machines.

Note that last feature particularly—the "American" is a three-man machine with three times the capacity and usefulness of any mere saw bench.

On its saw table you have a rip saw, cut-off saw and mitre saw—a dado and gaining machine—a grooving machine and a rabbitter.

At one side is a 6-inch jointer and planer; and matcher bits and moulding cutters can be inserted for all shapes. A sander drum and a disk sander are provided. And there is an emery wheel for grinding.

The boring table has a 6-inch feed and a vertical adjustment of 3½ inches. For sanding or grinding it supports the work.

And remember that all these functions are combined in a solid, compact, self-contained, durable machine with power built in (gasoline engine or electric motor), easily moved anywhere, ready for work at a moment's notice, right on the job.

American Saw Mill Machinery Co.
82 Main Street
HACKETTSTOWN, N. J.
1655 Hudson Terminal
NEW YORK CITY

When Writing Advertisers Please Mention the American Carpenter and Builder.

James' Stanchions Used

We have received word from Mr. M. T. Kellor of Beloit, Wis., whose round dairy barn won second place in the Prize Competition, that this barn is equipped in part with "James" sanitary steel stanchions made by the James Mfg. Co., Fort Atkinson, Wis. We are glad to have this additional information in regard to this very interesting and thoroughly modern dairy barn which was illustrated on pages 58 and 59 of the March American Carpenter and Builder.

A Mark of Progress

The Dow Wire & Iron Works of Louisville, Ky., have recently added to their already large equipment, two ovens for the enamelng department and an automatic pipe bending machine. This looks as if the company were preparing to take care of additional business which has been coming their way for a considerable number of years.

These people specialize in artistic steel and bronze work for banks and elevator enclosures; also iron and wire fencing, wire cloth and such articles. Incidentally we might mention that they have a handsome catalog which every builder will find very interesting. It is sent free on request.

The Mixer with the Hoist

When it comes to improvements—intelligent improvements that are bound to be of direct service—we are compelled to take off our hat to the Jaeger Machine Co.

Just as we began to think their concrete mixer had reached the point of highest efficiency, these people come along with another improvement that's certain to be most useful. Year by year we have watched the Jaeger Machine Co., directing every effort to making their mixer pre-eminent and always they have effected an interesting change or improvement. Now they announce a combination of the "Big-an-Little" mixer with a hoist.

You have heard of the "Big-an-Little" mixer. Who hasn't? And if rapidly increasing sales are an indication, the builders regard it favorably. Why, the Jaeger Machine Co. have found it necessary to establish sales agents in different territories to handle part of the business. But to tell you about this new arrangement.

Well, as you know the "Big-an-Little" mixer is equipped with a 2½ H. P. engine which generates ample power to run the mixer as well as any other machine the builder may chance to use. Consequently the Jaeger people simply attached a builder's hoist to their mixer, which can be thrown into operation by throwing over a lever. The mixer and hoist
Don't Take Chances

You need not buy concrete machinery before trying it. We ship any machine on approval; you set it up—operate it—test and prove it 15 days free. If it doesn't make good, ship it back at our expense and you owe us nothing.

DUNN HEAVY DUTY TILE MACHINE
Capacity 3,200 Tile
Price $350

DUNN TILE MACHINE
Capacity 2,000 Tile
Price $165

DUNN UTILITY MIXER
Capacity, 5 Cu. Ft.
Per Batch
Price $100

COMBINATION BLOCK MACHINE
Capacity 250 Blocks
Price $40

ORNAMENTAL MOLDS
All Sizes and Designs

You Can Find Out More
about the merits of our machines, by actually seeing them work yourself in your own plant on a two week's free trial than by any claims we can make. You'll find our machines right, our selling plans right, and our prices right. Be sure and get our proposition before buying.

Our 64 Page Book is Ready
It tells all about our 1913 selling plans and straight-to-you prices that will save you money. Just tell us what machine you are mostly interested in and we'll gladly send you a copy by return mail.

W. E. DUNN MFG. CO.
4132-34 Fillmore Street
CHICAGO

When Writing Advertisers Please Mention the American Carpenter and Builder.
in no way interfere with each other and both can be run at the same time or separately. From the illustration it can be learned how useful such a contrivance is in hoisting either concrete or mortar in barrows or buckets directly to the workmen. It saves several men’s time in wheeling the material. The hoist can likewise be used to place lumber, brick, or any other material, wherever wanted.

This is something worth considering. It’s up to you to do things quickly and with as little expense as possible. Get the data on this new feature by writing the Jaeger Machine Co., Columbus, Ohio.

A Furnace for Low Basements

In many cases where houses have been constructed with shallow basements or cellars, it has been found impracticable to install the ordinary furnace on account of its height, as the pipes could not be pitched sufficiently to allow proper circulation of heated air.

The Ajax Low Constructed Furnace has proved a success wherever installed in a shallow basement. This furnace comes in five sizes and the height varies from 56 to 60 inches. It is equally adapted to either high or low cellars as it is impossible to get too much pitch to the warm air pipes. The Ajax furnace has many desirable features. The ash pit is especially deep. The large double feed door makes this a dandy furnace to install the ordinary furnace on account of its height, as the pipes could not be pitched sufficiently to allow proper circulation of heated air. The fire travel is exceptionally long as the flames on leaving the fire pot at the rear are again carried to the rear through the lower flue. This spreads the heat more evenly through the radiators and the heating value of the circulating air is greatly increased. The manufacturers of the Ajax have not skimped in any way in the construction of this furnace as they have constructed the radiators so that they are practically ever-lasting. The fire pot also is worthy of notice as it is made to give the greatest amount of radiating service. Hot water attachments can easily be applied to this furnace.

No doubt many of our readers will often run into cases where a house has a low cellar or basement and on being consulted as to the advisability of installing a furnace they cannot conscientiously recommend it. If you keep the Ajax in mind you will always have a reliable solution to any of these difficulties. It has long been our opinion that any carpenter or contractor could greatly add to his income by assuming the agency for some reliably constructed furnace. The Co-operative Foundry Co. at Rochester, N. Y., are manufacturers of the Ajax and they have received many testimonials to its value. All inquiries from readers of the AMERICAN CARPENTER AND BUILDER will receive prompt and courteous attention. They maintain a special service department to answer carpenters and builders on any heating problem.

CAREY CEIL BOARD

Ceil Board is a solid sheet formed by three layers of first grade chip board, solidly cemented together by two layers of special flexible asphalt cement.

It is strong, tough and flexible. Ceil Board will never crack, break or chip. It is damp-proof, vermin-proof and sound-proof—hygienic and sanitary—and thoroughly fire-retarding.

Ceil Board is made in sheets 32 & 48 inches wide and in any length up to 10 feet. These sheets are nailed directly to the studs on both walls and ceilings—and they’re ready for the decorator the same day.

Every form of wall decoration works out perfectly on its smooth, even surface. It is furnished ready-decorated, too, in wood veneers for use in cabinet or panel work, or printed in special designs, such as oak grain.
**Send For Your Copy of This Free Book**

HERE'S a book that every carpenter, contractor or builder should have: "Natural Woods and How to Finish Them." Written by an expert, and full of valuable information that you'll be mighty glad to have at hand.

Remember that the finish on a job is sometimes the principal factor in determining the satisfaction of the owner. 55 years of varnish-making experience have gone into this book and there'll be many a time when you want to consult it. Simply write and say you want the book and it will go forward at once.

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**BERRY BROTHERS' VARNISHES**

BERRY BROTHERS

Established 1858

Factories: Detroit, Mich., and Walkersville, Ont.


When Writing Advertisers Please Mention the American Carpenter and Builder.
The Goodell-Pratt Co., Greenfield, Mass., have ready for distribution a new catalog, No. 11, in which our readers will find listed tools for the carpenter’s and builder’s kit. This company are tool smiths of long standing and employ all desirable features in the making of their products. Some implements of the trade are shown which will tend to materially decrease the time and labor consumed in various phases of carpentering. As the standing of this company and the reliability of their line is unquestioned, we suggest that interested builders and carpenters obtain the new catalog.

New Sickle and Tool Sharpener

The Luther Grinder Mfg. Co., Milwaukee, Wis., have just put out a new machine for sickle and tool sharpening which places farm sickle grinders in the class with strictly high grade machines.

The “Best Maid” sickle and tool grinder is a combination of Luther’s “Best Maid” type and of the Spartan sickle grinder. It has a special patented arrangement for swivelling the frame and is adjustable to any angle, vertical or hori-
There's just this about this Wall Board proposition—
If it is as good as we say it is, you, Mr. Carpenter & Builder, ought to know about it.
You can't afford not to be up to the minute in your building methods. That is why we are offering to send a Free Sample of Utility Wall Board to every Carpenter and Builder who will write for it.
We want you to know that

**UTILITY WALL BOARD**

is the most remarkable of modern building materials.
It is a tough fibre board, very stiff and easily handled—it is nailed direct to the studding and ceiling joist and takes place of both lath and plaster.
It makes a smooth even, wall and ceiling that will last as long as the house stands.
It is moisture proof, will not crack, nor warp, nor shrink and may be decorated in any way that you would treat a plaster wall. No muss or dirt in putting it on—and less expense than lath and plaster.

*MAY WE SEND YOU THAT SAMPLE?*

THE HEPPES COMPANY, 4503 Filmore Street, CHICAGO, ILLS.
A structure well painted is insured against decay and depreciation. Thus your property inventories higher and your profit and loss account stands you in more on the credit side. Never paint spasmodically; do not let your structure run down and then make a fruitless effort to bring it up to efficiency. This is waste of money and hits you hardest at your weakest time. Use good paint; make regular inspection and paint with Dixon's Silica-Graphite Paint.

It is made in four colors—one quality only, and is equally suitable for metal or wood. The leading railroads and manufacturers have adopted it, after exhaustive tests, as their maintenance paint. Nature's unrivalled mixture of the silica and graphite is alone mined by the Joseph Dixon Crucible Company at Ticonderoga, N. Y.

Improved Level for Contractors & Builders

The David White Company, 419 East Water St., Milwaukee, Wis., progressive manufacturers of builders' levels, have just completed their new and Improved Level for 1913, which is illustrated herewith. The Company wish to point out and particularly call the attention of the contractor and builder, to the fact that they have incorporated into this Improved model, new and special features such as longer and more tapering centers, thus rendering the level less liable to become out of adjustment; improved locking device for the Y's, thus dispensing with the old-fashioned pin bolts; spiral motion to eyepiece, which enables a more precise focusing of the cross hairs; long powerful telescope with magnifying power 25 diameters, thus particularly adapted for running long levels.

Cypress Uses in House Building

By JOHN BEMER CROSBY.

"Is it suitable?" That is the acid test now being applied to building materials. In the vocabulary of the educated builder "suitable" stands for durability, workability, beauty.

For every purpose for which it is recommended by its manufacturers, and there is a great array of special adaptabilities, cypress sustains with ease this crucial test. Distinctly it is a "suitable" wood. Those who build for the future as well as for the present use cypress for those purposes for which the "Wood Eternal" has no superior.

Cypress is far too valuable to be used indiscriminately by the building trade. It need not be used where cheap woods might serve acceptably, yet it is coming to be more and more used in places where "good enough" lumber is not so much the object as permanent investment value. But cypress adds so definitely to the value of a structure that builders and owners most experienced consider that practically it must be used for those special purposes for which few other woods can be used with like assurance of satisfaction.

The foregoing is prefatory to the statement which is made by those interested in this wood that the really ideal building is made entirely of cypress. The cypress resources of the nation are not great enough to permit every one to build an ideal structure—there is not enough cypress lumber produced to furnish material for all buildings. Fortunately, however, the amount of cypress timber is ample for us and our children to employ it to our hearts' content at prices much below its actual investment value.

Many people are introducing themselves to cypress by using it as a sort of preserving veneer, shutting out the elements of destruction and safeguarding the interior from decay—and then, before they realize it, are putting cypress trim in the dining room or "Sugi" finish paneling in the library.

This House is Built to Last

Are your houses built for permanence? You can be absolutely sure of a good plaster job—one that will stand up every time and be a future business getter for you—if you plaster on

XX Century Lath

Acid Resisting

XX Century Lath is made with a mesh that "keys" the plaster to it and prevents cracking and falling off. It is cut from U. S. Standard gauge sheets, the thickest metal gauge in use and is shipped coated with carbon paint to prevent rusting.

Send for Booklet 34. It will give you many more reasons why XX Century is the lath that lasts. Our monthly bulletin, "Expanded Metal Construction", will be sent to Contractors on request.

IMPORTANT:—We can ship XX Century Lath within 48 hours of receipt of your order.

Largest Exclusive Manufacturers of Metal Lath in the World

NORTH WESTERN EXPANDED METAL CO., 903 Old Colony Bldg., CHICAGO

When Writing Advertisers Please Mention the American Carpenter and Builder.
A Free Book

for the contractor and builder, "Small Farm Buildings of Concrete." This 160 page illustrated book, telling how to build small concrete structures, should be in the hands of every builder and contractor. It is full of valuable information, drawings, pictures, instructions, directions and suggestions.

Building of concrete offers a profitable field of work in all localities, particularly among the farmers. Learn how to do this class of work by studying this book.

Farmers want concrete milk houses, barns, corn cribs, granaries, hog houses, root cellars and poultry houses and very often cannot find a contractor to do the job.

Write to our nearest office for this free book, "Small Farm Buildings of Concrete" and it will be sent you promptly upon receipt of your request.

Universal Portland Cement Co.

Offices

Chicago 72 West Adams Street
Pittsburgh Frick Building
Minneapolis Security Bank Building

Plants at Chicago and Pittsburgh
Annual Output 12,000,000 Barrels

When Writing Advertisers Please Mention the American Carpenter and Builder.
Clow Cast Iron Specialties

<table>
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<th>Size of top</th>
<th>In.</th>
<th>12x12</th>
<th>16x16</th>
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A-2187

Cleanout Cover and Frame

Size: | Inches |
---|---|
16x16

A-1700

A-2185

Extra Heavy Cesspool

Size of top: | Inches |
---|---|
16x16

A-1701

Grating with Loose Frame

Size, inches: 8x8 10x10 12x12 14x12 16x16

A-2015

Grating

Size, inches: 9x9 12x12x12x12

A-2020

Cast-Iron Grating

Diameter: 4 5 6 7 8 9 10

A-1915

Cast Iron Bar Strainer

Diameter: 4 5 6 7 8 9 10

A-1910

Cleanout Cover and Frame

A-2200

Air Brick with Sliding Ventilator

A-2000

Cast Iron Air Brick

A-1720

Cleanout Cover and Frame

Applying the "exterior veneer" principle, every builder may insure his structure against rot tendencies and other deteriorating influences by "veneering" the house with cypress. This calls for the use of cypress for all outside woodwork. It is the exposed woodwork that bears the brunt of the attack and the wise general masses his greatest defensive forces at the exposed posts.

Safeguarding a Weak Spot

The absolute safety of the building, however, is not assured by using cypress for this purpose. There are other points of attack that should be guarded. The chief one is where the frame structure joins the foundation—the sills or bearing plates. These rest on the cold, damp material of which the foundation is made. They serve as the super-foundation of a frame building.

The entire weight of the building is carried by the sills. There are many points of contact between the sills and the studding, each one of which is an ideal point of attack for destroying fungi. The foundation usually transmits the necessary moisture to feed the fungi and the result is deterioration, slow at first, but becoming more rapid as the destroying agent strengthens its hold.

Destruction of wood at this point is commonly attributed to "dry-rot," a somewhat misleading term. There is no such thing as dry-rot. Utter absence of moisture or complete submersion in it renders wood impervious to decay. Certain wood destroying fungi thrive with a minimum of moisture and where they secure a foothold "dry-rot" is said to have set in.

Cypress is relatively impervious to rot influences and it is for this reason it is recommended by its backers for duty at all exposed points, and important among the points are the sills of a house. The use of cypress for this purpose completes the veneer.

The extra cost of the absolutely necessary quantity of cypress—its cost being somewhat higher than many woods—

Send For Catalogue 39

James B. Clow & Sons
CHICAGO, ILL.

When Writing Advertisers Please Mention the American Carpenter and Builder.
Beaver Board Is More Than a Wall-Covering

It's the whole wall, except the studs, and entirely does away with the need of lath, plaster and wall-paper. At the same time it can be put over old plaster where necessary. The genuine, patented, nationally advertised Beaver Board is a Pure-Wood-Fibre proposition handled exactly like lumber, but vastly superior to it for walls and ceilings of every type of building.

Get the whole thing straight in your mind by sending for free pamphlet, "The A. B. C. of Beaver Board Construction."

The Beaver Companies
United States: 181 Beaver Road, Buffalo, N. Y.
Canada: 381 Wall Street, Beaverdale, Ottawa
Great Britain: 4 Southampton Row, London W. C.

Nailing Beaver Board to the studing of a new room, it can also be put over old lath and plaster.

LISTEN!

Surfaces waterproofed to prevent buckling!

Furnished in three finishes—plain oak, cream white and burnt leather. Requires no further decoration!

Battens to go with it—of same material!

Of standard NEPONSET Waterproof Building Products quality!

NEPONSET WALL BOARD
For Walls and Ceilings
WRITE FOR SAMPLE
Address
BIRD & SON East Walpole, Mass.
24 River Street

There is Only One

It's not classed with the cheap substitutes for lath and plaster. It is not like so-called "wall boards." It is a wall lining in a class by itself—the most practical, the most successful. Thirteen years of severe tests in thousands of homes have proven its superiority.

How You Can Know the Genuine

Get the sample as illustrated above—notice the construction. It is built with kiln-dried wood slats as the foundation, pressed between layers of air-tight cement and specially prepared paper into a stiff, straight sheet %4 inch thick.

Why Contractors and Builders Should Use Compo-Board

It is stronger, more durable than lath and plaster, or any of its substitutes. Impervious to cold, heat and moisture. Its smooth surface can be decorated with paint, kalsomine or wall-paper—with or without panels.

It enables you to complete a house 15 to 30 days sooner—give greater satisfaction to your client and get a higher price.

Sample and book free—(Tells in an interesting way all about this modern wall lining).

Northwestern Compo-Board Co.
5777 Lyndale Ave., North Minneapolis, Minn.

Plastergon Widens Your Field of Work

The Plaster's job comes to you—you get the decorating, too.

You're not confined to houses—you can install Plastergon in new and remodeled offices, garages, warehouses, etc.—even where dampness, vibration or excessive temperature exist.

Plastergon Only Guaranteed Wall Board

Plastergon is chemically treated by our exclusive process. You take no chances—you can't afford to—you might endanger your reputation as a builder. Plastergon costs less than lath and plaster—lasts as long as the building. It's other superiorities are numerous. Let's tell you about them and how easy it is to get Plastergon jobs. Write today.

When Writing Advertisers Please Mention the American Carpenter and Builder.
is almost infinitesimal. If cypress is specified and included in the estimate the man who pays for the structure never would be aware of any addition to the price; probably there would be none.

Here are the actual figures: Take an ordinary house with, say, 150 feet of outer wall. Using one piece of 2 by 12 and one piece of 2 by 10 for a box sill it would require 550 feet of lumber for the sills. If it was necessary to pay as much as $20 a thousand feet more for the cypress, the cost of the whole building would be increased only $11. Surely that is a very small premium to pay for assurance against the necessity of putting in a new super-foundation for the entire structure, repair work that would cost several hundred dollars, plus untold inconvenience.

An Advertised Product
The merits of cypress are being pressed home upon the consciousness of the building trade. Previous to the inauguration of this campaign cypress was handled just as other kinds of lumber are handled. Probably it was used for many purposes for which some other kind or kinds of lumber would have served as well. Certain it is that the building trade was not securing the value from cypress that it has since its merits have been widely promulgated.

There existed in the mind of the public a hazy sort of idea that cypress was all right, but when they were shown another kind of lumber and informed that it was just what they needed, confronted by a situation of that kind and having nothing with which to back up their own ideas or impressions the buyer meekly submitted and

Wall Beds
We are the Pioneers of the wall bed industry. We also make the old style recessed Upright Wall Bed, which has the wooden frame work under it. We particularly recommend our latest achievement, the Oscillating Portal Wall Bed, which is an absolutely sanitary bed. To introduce our wall beds more extensively in the eastern and middle States, we will sell at cost, and prepay the freight charges to any part of the United States, where we are not represented, for a limited time only. Write for literature and particulars today.
If you are interested in building or re-decorating, send for this remarkable book "Modern Wood Finishing." It is filled from cover to cover with money-making suggestions; it gives many valuable ideas for the interior decoration of the home.

This book tells you how to obtain the various effects on wood. There are eighty-eight different wood finishes reproduced in life-like colors. In fact, it is the most exhaustive treatise yet published on the subject—an education in itself.

It costs no more to obtain an exquisite finish, than it does a poor one. It is chiefly a question of knowing how to get the effects you desire. This book tells of the ease and economy with which Bridgeport Standard Wood Finishes are applied. The unusual attractiveness—the luminous beauty—and the smooth, transparent finish they give, explains why Bridgeport Standard Wood Finishes are recognized as the utmost in value.

Send for a free copy of Modern Wood Finishing—today.

BRIDGEPORT WOOD FINISHING CO., New Milford, Conn.

NEW YORK CHICAGO BOSTON

Is the Roofing FOR YOU

If you are interested in a roofing giving a warm, coppery red tile effect—more durable than shingles or metal, yet less expensive.

If architectural beauty, ease of laying, surety against leaks, extremely fire resistant and absolute permanency appeal to you, look no further for roofing—ZOLIUM is what you want.

ZOLIUM is backed up just as you want it to be.

It will serve you well.

Send for sample and booklet A-C-1.

Flinktone Manufacturing Company
88 Pearl St. BOSTON, MASS.

The Cott-a-lap Co.

Somerville • • • New Jersey

Your Customer will be delighted with

Roberds Ideal Wall Board

It makes such a beautiful interior finish at such a reasonable cost. It can be painted, papered or tinted and lasts forever. It never gets shabby, never cracks, peels, chips or warps and is proof against vermin, heat, cold, fire and moisture.

Roberds Ideal Wall Board comes in sheets all ready to be nailed to the studwall. Your cheapest man can apply it without previous experience. No muss, no confusion, no delay and no disappointment.

Our special proposition to carpenters and builders is unusually attractive. Write for it today and we will send you full particulars, samples, prices, catalog and testimonials from other contractors.

The Roberds Mfg. Company

100 Railroad Street MARION, INDIANA

When Writing Advertisers Please Mention the American Carpenter and Builder.
This spring Contractors and Builders again face the problem—scarcity of good wood shingles. Can’t always substitute slate, either, for various reasons.

But there is a substitute that is more than a substitute. Something that not only takes the place of wood shingles or slate, but actually gives better results. That something is Cortright Metal Shingles

**The Permanently Perfect Roofing**

Unlike the wood shingle roof, which burns like tinder, the moment a spark drops on it, or in the birds’ nests usually to be found in the eaves, CORTRIGHT METAL SHINGLES cannot burn under any conditions. They last as long as the building, and never need repairs.

Before going ahead with your Spring roofing propositions, get our free book “Concerning That Roof,” and detailed information without obligation, by simply signing and returning the attached coupon now.

Cortright Metal Roofing Company
PHILADELPHIA and CHICAGO
A six-inch lap is better than a three-inch lap. It gives better protection against leaks and permits nailing down on the under sheet only, so that no nail heads appear on the surface. Otherwise this is the same Granite Roofing that we have sold for 29 years for use on great factories. It is @ from damage by coal, smoke or cinders, and it has a you gain four peculiar advantages by roofing with Asbestos "Century" Shingles. They are the first practical light-weight roofing made of reinforced concrete. They are absolutely fire-proof. Low insurance Unaffected by weather conditions. No painting—No repairing. Their durability increases with age. Last forever.

Write for names of representative roofers who can outfit your building with Century Shingles and Booklet, "Roofing A Practical Talk."

Montross Metal Roofing Co., 2nd and Erie Sts., Camden, N. J.

Our Galvanized Shingles are high grade base plate, tinned and redipped by hand, carrying a 60% heavier coating of pure Zinc than large Commercial sheets.

Let us send our catalog and explain Montross Shingles fully. Live agents wanted for exclusive territory.

Montross Metal Roofing Co., 2nd and Erie Sts., Camden, N. J.

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How to Make More Money Building Barns

Every man in the building business can have the benefit of W.D. James' barn knowledge and use it to his own advantage and profit. There's more money in building up-to-date, properly equipped barns on scientific principles than in putting up the old type. The right kind of a barn means an enthusiastic owner, and that means more jobs in the same neighborhood.

Get Our Special Blue Print and Building Service Offer

Mr. James is the foremost authority on dairy barn building, and he wants to make you a special offer of complete working blue prints of several practical dairy barns of different sizes and types. In addition to Mr. James' personal co-operation, you can have help from our architectural department, conducted by experts. Write today for all the facts regarding this service.

James Manufacturing Co.
A H. 75 Cane Street Ft. Atkinson, Wis.

This Valuable Book Free

—tells about new and better construction—lighting—size—site—drainage—general equipment—King system of ventilation; gives floor plans of successful barns. Your copy—Free— if you answer these questions: For whom do you expect to build or remodel dairy barns? (Give names and addresses) Where? For how many cows? Send your application now for book and complete information.

For Business or Pleasure

IN a motorcycle for business four things are essential, and the MONARCH is the only machine to combine all these necessary points. First, Durability. Second, Comfort. Third, Power and Fourth Speed. There is no competitor for the MONARCH in any of the above.

If you want maximum efficiency with minimum expense, get in line for the 1913 MONARCH.

Please address
Sales Dept.
IVES MOTORCYCLE CORPORATION
Owego, Tioga Co., New York

Metal Ceiling Exhibit Draws Crowd

This photograph shows the display both of The Canton Art Metal Co., manufacturers of high grade sheet metal products, Canton, O., at the New York State Retail Hardware Dealers' Association recent convention. This photograph shows an entirely new feature in metal ceilings. The arrange-
Planes You Can Depend On

You will never mar a surface or splinter an edge with the finishing stroke if you use a Keen Kutter plane. The working surface is true—the knife so delicately adjusted that a shaving may be hair-thin or thick as a chip. Like all

**KEEN KUTTER**

Quality Tools

these planes have the feel and hang that enable you to get the best results. All are stamped with the over 45-year-old trade mark that guarantees satisfaction or money back.

"The Recollection of Quality Remains Long After the Price is Forgotten."

—E. C. SIMMONS.

If not at your dealer's, write us.

**SIMMONS HARDWARE CO., Inc.**

St. Louis  New York  Philadelphia  Toledo  Minneapolis  Sioux City  Wichita

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**THE LA PLANT HEAVY HOUSE MOVING TRUCKS**

When you get a job with an old building on the lot—move it with the La Plant Trucks to another place—instead of wrecking it. There is more profit in it for you.

La Plant Heavy House Moving Trucks are made of steel—on scientific lines—are interchangeable so they can be worked singly, in pairs or in fours.

Write for catalogue O and see how easy it is to wheel a building a mile in a day—and how little the cost is for La Plant outfit compared with the profit to be made in moving houses instead of wrecking them.

**LA PLANT TOOL CO.**

1100 E. Nevada St.  Marshalltown, Iowa

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**TRY IT FREE**

Why, compared with the grindstone or emery wheel, it is mere child's play to do the toughest job of grinding—and with the patent tool rests and attachments an apprentice can do any job of sharpening, such as ginning, saws, sharpening plane bits and twist drills as well as a high paid mechanic. Try it 30 days absolutely free—then if you don't want to keep it, return it at our expense.

**Cuts Steel as Emery Does Copper**

Dimo-Grit, the new artificial diamond abrasive, peels steel away in tiny shavings—25 times faster than grindstone, 10 times more efficient than emery—no need of water cooling, no danger of drawing temper. Will not glaze or wear lopsided. Dimo-Grit is especially adapted for steel. Carborundum wheels supplied when wanted.

**LUTHER SHOP TOOL GRINDER**

Foot and engine power—built completely of steel and iron, enclosed shaft drive like an automobile, dust-proof bearings—runs as easy as sewing machine—400 revolutions per minute by foot power.

**LUTHER GRINDER MFG. CO.**

1905 Michigan Street  MILWAUKEE, WIS.

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cient and pleasing manner. This, coupled with the unexcelled facilities for the handling of materials and shipping of orders, gives the merits of this company the benefits of a prompt and most satisfactory service.

The large warehouse and office building (as shown in this view) contain over 42,000 square feet of floor space and are constantly stocked with a full, complete and most attractive line of modern, high grade sanitary plumbing fixtures and equipment of practical and latest designs; hot water and steam heating appliances of the newest and most efficient types, also with gas, steam and water supplies of first quality. This concern is in a position and fully prepared at all times to make prompt shipment of all orders, large or small, immediately on receipt.

The large and comprehensive catalog as issued by this successful supply house should be in the hands of every architect, contractor and builder; for therein are shown in every detail all materials that may be required to insure the most modern, practical and sanitary equipment for bathroom, laundry or kitchen, also for heating or water supply. As this is a very expensive catalog, it is hoped that those asking for it will do so for business reasons and not from mere idle curiosity.

The plumbing fixtures shown in this catalog such as bathtubs, lavatories, water closets, sinks, laundry trays, etc., are of the most pleasing and attractive designs and are generally known for their durability, sanitary qualities and perfect construction. While a very elaborate and high grade stock of sanitary fixtures are shown suitable for the most expensive residences or buildings you will also find shown a complete line of moderate and low priced material which meets the demands of those desiring cheaper but still perfect and durable fixtures.

Specify MF Ternes

THE FEATURES

Of our Roofing ternes are a base plate of Copper Bearing Open Hearth Steel, thoroughly annealed and accurately re-squared—and a good uniform coating. The weight of coating carried is stamped on each grade.

THE COATING

On our MF Roofing Tin is 32 pounds—the weight best suited generally. We manufacture Roofing ternes from 8 to 40 pounds coating—the best modern skill can produce. Send for booklet "The Roof of Quality and Service."

Our Copper Bearing Open Hearth Roofing Tin is stamped "C. B. OPEN HEARTH" in addition to the brand and the weight of coating carried. We also manufacture Apollo Best Bloom Galvanized Sheets, Formed Metal Roofing and Siding Products, Black Sheets of all Descriptions, Special Sheets, etc.

American Sheet and Tin Plate Company

General Offices: Frick Building, Pittsburgh, Pa.

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Fair Play for Contractors

Mr. Carpenter-Contractor:—
The 1913 Copyrighted Edition of The Contractors Red Book is now ready for distribution.

The Contractors Red Book is the one book which gives the Carpenter-Contractor a fair and square deal.

The Contractors Red Book is not a mail order catalogue, and will be sent to Carpenter-Contractors only.

The Contractors Red Book is a 96 page Price Book, profusely illustrated, of convenient size for carrying in a coat pocket, and is the only Price Book issued that co-operates in every way with the Carpenter-Contractors in the distribution of Lumber and Millwork.

The Contractors Red Book is fully protected by Copyright, and is issued only by Barrows & Donnellan Co., Manufacturers of Lumber and Millwork, the Largest Company of its kind in the United States selling its products exclusively through Carpenter-Contractors.

The Contractors Red Book—also Our Plan For Co-operating with Carpenter-Contractors (the long-felt need of the Carpenter-Contractors)—will be mailed Free, provided your request is received on your Letter Head or Business Card, to identify you to us as a Carpenter-Contractor.

Write Today—Limited Edition—New Idea
Address your request to
Barrows & Donnellan Co. 8700 Erie Avenue
CHICAGO, ILLINOIS

Every Fire Helps Your Business
Of course we all sympathize with the fire-stricken house owner. But with American pluck he promptly rebuilds.

And he, and his neighbors, have learned this lesson: That shingles are kindling wood; too dangerous to have on their house tops. That even a frame house can be semi-fireproofed by covering it with our

Genuine Bangor Roofing Slate
Sparks striking frame walls glide off too quickly to do harm. The danger is on the roof, where sparks lodge. Genuine Bangor Roofing Slate is non-combustible. Being a non-porous, hence non-absorbent mineral, our slate does not decay. Being stone it does not rust.

It is tough and—unlike other slate—will arrive and can be handled WITHOUT breakage.

The best proof of its superiority are the many attempts to sell other slate under a name resembling ours.

As a business man, always eager for more business, more profits and more business reputation, it will pay you to let us tell you more about our Special Co-operative Plan for helping you to increase your business through our Trade Help Department.

This puts you to no obligation or expense. Write us today for further information. Fill out the attached coupon. Then tear it off and send it today. You will find it mighty profitable.

Genuine Bangor Slate Co.
Drake Bldg. Easton, Pa.

When Writing Advertisers Please Mention the American Carpenter and Builder.
Good Profit For You

The furnace is not one of the first things you handle in building a house, but it is one of the first in importance.

Many builders who have done the best kind of carpenter's work, masonry, plumbing, etc., and who were entitled to the owner's gratitude so far as the structure itself was concerned, have had grief in the end because the heating plant was not right.

You never have trouble of this kind when you put a Kalamazoo in any job you have. We want you to get acquainted with Kalamazoo quality, service and profits. This is the furnace easiest to install—its results are guaranteed—and the saving of jobber's and retailer's profits, expenses, etc., enable us to put better quality into a job and deal with you on liberal terms. We are able to prove the supremacy of the Kalamazoo Furnace.

Simplicity of installation is one big point. From a sketch of the house, showing location of rooms, size, prevailing winds, direction the building faces, etc., our expert engineers work out blue prints that are sent on free. These show everything—make it all simple. It is the most complete installation service ever devised.

An absolute guarantee of quality and satisfactory use backs up every Kalamazoo heating system. The owner must be pleased—and that responsibility is ours. Perfect insulation—greater heating surface—fuel economy—complete air circulation; these and other points of Kalamazoo supremacy are proved.

There are no unpleasant "come-backs" when you install a Kalamazoo. We are behind the owner—behind you—with that strong guarantee and with a system that holds our last degree of confidence because of its known goodness.

*Write for Free Book No. 947 telling all about Kalamazoo services—its superior construction. We'll make you liberal terms—show you how the building season of 1913 can be a better season for you from the minute you make up your mind to handle Kalamazoo furnaces. Don't delay. Let us hear from you by return mail and complete information will be sent you at once.*

Kalamazoo Stove Co.
Kalamazoo - Mich.

When Writing Advertisers Please Mention the American Carpenter and Builder.
Three Pertinent Reasons Why Every Carpenter and Builder Should Endorse Vapor-Vacuum Heating

1. The permanent satisfaction to the owner. There is never the slightest "kick" about Vapor-Vacuum Heating (Kriebel System), but, on the other hand, the owner enthuses —tells his neighbor and the men down at the office and tells them WHO RECOMMENDED the system.

2. You are able to point out to the owner a guaranteed saving of 25 per cent on coal, and when he reads our "Little Primer," the book written so any one can understand it, he knows for himself why the V-V system saves him 25 per cent on coal and why you recommended it.

3. Our Engineering Department helps you by preparing, free of charge, complete heating layouts of any job you will send us sketches of. That's exactly what we have the Engineering Department for.

Write now for a copy of the "Little Primer" and let us tell you how we co-operate with carpenters and builders. No obligation.

VAPOR-VACUUM HEATING CO.
895 Drexel Building
Philadelphia

FORBES FURNACE

The secret of a builders success depends on the number of his satisfied customers. The way to satisfy them in regards to heating is to have a "FORBES FURNACE" installed in the house. We don't want to take up your valuable time but would ask that you write us for a catalog which contains full information and which you can study at your leisure.

Tubular Heating & Ventilating Co.
Department "X"
232 Quarry Street

$QUICK SALES LARGE PROFITS$

Building Contractors are making large profits selling the Detroit Combination Gas Machine to farmers and others located where city gas is not available.

You make a big Profit on the sale of the Plant, another Profit on the installation and sale of appliances Three Profits in One Deal.

Detroit Combination Gas Machine

For Lighting and Cooking
If you are not already selling this machine, it will pay you to start at once. It makes the cheapest Gas for Lighting—Gas for Cooking
Gas for Laundry—Power Purposes and for all other uses common to city gas at just as cheap or cheaper cost.

These plants have been the standard for over 44 years. Perfectly safe, entered in Class A National Board of Fire Underwriters. More than 20,000 in use in Residences, Stores, Factories, Churches, Schools, and Hospitals. Write today for complete information and dealers' terms.

Detroit Heating & Lighting Co.
546 Wight Street
Detroit, Michigan

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as to do away with all friction when in operation, are another of their products. They also make a Special Hollow Ground Saw for smooth cutting either with or across the grain. This same style Saw with Combination Tooth used for cutting both with and across the grain is a product of their manufacture used extensively by pattern shops and in packing rooms; it being especially desirable where a little cutting both with and across the grain is necessary and the operator cannot spare time to change saws.

The Huther Patent Groover or Dado Head is used today by wood workers in all parts of the world. These heads are used for cutting grooves of any width or depth either with or across the grain, and are composed of two special saws or blades which have beveled sections, thus giving the Cutter the combined cutting qualities of a knife and a saw, and of Special Two-Tooth Inside Cutters which are made up 1/16 in., 3/32 in., and 1/8 in. thick. In order to cut grooves of different widths, all that is necessary is to either add or take away the inside cutters. These Dados are excellent tools for manufacturers of furniture, sash, doors, blinds and carriage bodies; in fact, for anyone who has a saw mandrel, as they can be used for various kinds of work. Huther Brothers send their Grooving Head to all parts of the world under condition that if it does not prove satisfactory after ten days' trial, it may be returned and transportation charges both ways paid by them.

For several years the goods produced by Huther Brothers Saw Mfg. Co., Inc., have been recognized as of a high standard in the saw maker's art. Those having used their products acknowledge this fact; others will after a trial. You will find their Catalog No. 33 both interesting and instructive. All those having power woodworkers should have it.


BOWMAN SUPPLY & MFG. CO., INC.
PLUMBING, GAS, STEAM & WATER SUPPLIES

If Interested Write for Catalog.

PITTSBURG, PENNA.

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"Snap Shot" Money in Your Pocket

LISTEN! $5 to $20 a day—easy. Be a one minute photographer. Look! Cable, Wyo., writes: "Made $27 in 2 hours."

Perry, Ky., writes: "Made $50 in 2 days."

Hundreds of similar reports on file. Start business for yourself. Small capital. No experience. Big, quick profits at fairs, picnics, private houses—EVERYWHERE. Profits start at once. Write us today. Get out of the "time clock" line and the "pay-envelope" brigade. Investigate the "MANDEL" POST CARD MACHINE

New invention—wonderful machine. Takes, finishes and delivers original post card photos at the rate of 3 a minute—Right where you take them. New, startling, sensational photographic success—Photos Direct on Post Card

Machine is everything in one—a complete portable post card gallery. Gets the interest, attention and order from every onlooker. Sale of first supplies gives you back practically entire investment. You make money on the same day cash arrives. Immediate orders, immediate profits. Do you want to make $200 a week? Then write at once. INFORMATION IS FREE. Address either office.

THE CHICAGO FERROTYPE COMPANY
619 Ferrotype Bldg., Chicago, Ill. or 619 Public Bank Bldg., New York, N. Y.

How to Install Your Own Plumbing and Heating Systems

Builders, contractors and home owners—my big new book tells you how to install your own water system, modern heating plant, and bathroom outfit. You can easily install a running water system or a modern heating plant from the complete plans and instructions furnished to you free. The saving is enormous. Before you build, before you make improvements, send for my free book.

How to Save On All Material

My method for saving on all material is a revelation even to the most experienced contractors and builders. Get this free book and see for yourself. You get guaranteed material at the lowest bid-rock bottom price. My money-saving method is a blessing to every builder and home owner.

Gibbons New Method

Every home, even the smallest cottage, can have running water or a heating plant. Churches, halls and schools can have these improvements at a low cost. My free book explains all. Write for it today.

BOOK FREE

My new book gives you greater buying power than your local dealer. Thousands of things illustrated and priced. Gasoline engines, hydraulic rams, pumps, pipes, valves, electric lighting plants, acetylene, lighting plants, all accessories, everything guaranteed. You certainly ought to have this book. Send today.

M. J. GIBBONS, Dept. 2418, Dayton, O.

Everybody Can Afford Wolff Plumbing

Specify Plumbing Goods made by a firm of long established reputation, whose goods are of unquestioned value, rather than be tempted by price consideration into buying substitutes which can only result in disappointment and loss. Our Suggestion Booklet shows a series of designs for bath rooms from $60.00 upward. Sent upon request.

L. WOLFF MANUFACTURING COMPANY

Plumbing Goods Exclusively

MAIN OFFICE

601-627 W. Lake Street

CHICAGO

SHOWROOMS

111 N. Dearborn Street

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T. L. Smith Co. Hold House Warming

The Grand Re-Union and House Warming of the T. L. Smith Company at Milwaukee, Wisconsin, on February 26th and 27th, marked a very important event in the history of this pioneer concrete mixer company. This was the formal opening of their magnificent new office building located across the street from their present shops. The celebration took the form of a reunion of the out of town managers and agents who came to Milwaukee as the guests of the T. L. Smith Company. While here they were entertained in various pleasant ways. The mornings were taken up with trips through the several shops comprising the Smith Company’s immense plant. These excursions were made as instructive as possible by demonstrating the various new machines which will help keep this progressive company at the front during the year 1913.

During the noon hours the guests, including the department managers of the local offices were treated to a splendid luncheon. The Chief Engineer of the Company, Mr. E. W. Meyer, proved himself a splendid host on these occasions, as everyone seemed to be enjoying himself.

Cut Costs to Builders

When it comes right down to a point of investigation it will be found that the high cost of building material is often due to the maintenance of individual selling organizations. Each factory has been in the habit of appointing one or more “middle men,” which necessitated boosting prices to make his profits and to cover the cost of rehandling the goods. A direct

Six months ago a prominent builder up in Michigan wrote for a sample of Flex-a-Tile. He got it. He is doing a lot of building and every house he puts up is being roofed with Flex-a-Tile Asphalt Shingles. “Its the greatest roofing on earth,” he writes.

**FLEX-A-TILE ASPHALT SHINGLES**

makes a real roof in every sense of the word. Absolutely weather proof—practically everlasting and as beautiful as any tiling you ever saw.

Also—they are easily and quickly put on and as inexpensive as good wood shingles. Flex-a-Tile Asphalt Shingles are made of solid asphalt surfaced with chipped slate and granite. The natural colors of the slate and granite are green and dark red. They are of course everlasting—can’t fade or wear off.

Better send for a free sample today—You need Flex-a-Tile in your business.

**THE HEPPES COMPANY** 1010 Forty-fifth Ave., Chicago, Ills.

When Writing Advertisers Please Mention the American Carpenter and Builder.
WANTED! CARPENTERS AND BUILDERS

in every locality to use Unito Products

Unito Asphalt Roofing    Unito Excell Metal Tile
Unito Asphalt Shingles    Unito Excell Metal Ceilings
Unito Excell Metal Roofing Unito Wallboard
Unito Engines

20 BIG FACTORIES SELL TO YOU DIRECT

Through ONE SELLING OFFICE. They want to co-operate with you to enlarge your business and increase your profits. Our Co-operative Factories-to-you selling plan not only enables you to buy Better Goods at Lower Prices but actually helps you to get business you are not getting today. We guarantee complete satisfaction to you.

OUR SPECIAL PROPOSITION FOR YOU

Is for carpenters and builders ONLY. We want you to take advantage of it. Don’t turn over this page until you send for our big illustrated catalog. Learn what this means to you. Prices talk. Our catalog tells everything. Remember our selling plan will give you BETTER GOODS, BETTER SERVICE, BETTER SATISFACTION at lower prices than you ever paid before.

Write for our Catalog.
Contractor's Dept., Room 716
THE UNITED FACTORIES CO.  Cleveland, Ohio

A SIX-FAMILY HOUSE OF CONCRETE CONSTRUCTION

The concrete work from cellar to roof-peak was completed in thirty days. It was necessary on this job to maintain a thoroughly mixed, uniform output. It was essential that the work be rushed to completion rapidly and efficiently.

The concrete for this six-family house was mixed with the

EUREKA MIXER

For speed and uniform output, the Eureka has never been equalled. It means money in your pocket to know more about Eureka mixing. Remember that Eureka Mixers dot the globe and are everywhere cutting costs for their owners. Over 300 Eurekas are used in New York City alone. Write for Catalog, names of users in your locality, and name of nearest distributor for your territory. As a matter of precaution, we suggest that you do not delay should you want spring delivery.

WHAT THE CONTRACTOR SAYS:

Jan. 5, 1913. Your Eureka Mixer has worked well and to my entire satisfaction during the entire job.
New England Concrete Construction Co.
Ted. Metzger, Mgr.

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Detroit: Walter B. Harris, 1639 Lathrup Ave.
Eureka Machinery Co., 335 River St., P. O. Box 119.
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Washington: Thomas Jackson & Son, 425 Colony St.
Atlanta, Ga.: Progressive Sales Co., Haynes and
Rhodo Sts., P. O. Box 1294.

EUREKA MACHINE CO., 85 Handy Street, Lansing, Michigan

When Writing Advertisers Please Mention the American Carpenter and Builder.
and in every sense of the word—"Factory to Consumer" selling plan is one of the best means for cutting high prices.

With this idea well in mind the United Factories Company was organized. By co-operating, twenty large factories maintain one selling office which is not much larger than each individual factory would have to maintain if it were trying alone to do business with the consumer. It will be seen that by this plan the cost of selling is about one twentieth of what it would otherwise be. That naturally means better quality and lower prices; for no one stands between the factory and the consumer grasping profits, and there is but one shipment—from the factory to the buyer.

So with their 20 big factories all working to maintain a high quality in their products the United Factories Company claim to be able to give a better grade material at a lower price and aim to co-operate with the carpenter, builder and contractor, helping him in every way to increase his business and reach out for that which he is not getting now. Liberal guarantees cover every shipment and the United Factories Company generously specify that if their goods are not exactly as represented the buyer may return the shipment at the factory's expense.

A few of the products of this immense factory system are metal tile, metal shingles, metal roofing and siding, composition roofing, asphalt shingles, wall board, metal ceiling paints, and many other lines especially interesting to builders. Illustrations of the Unito Metal Roofing Tile and Unito Asphalt Shingles are shown. Our readers are doubtless anxious to increase their business and profits, so we suggest that they investigate what this company offer. The price of a stamp will probably save you many dollars. Address The United Factories Company, of Cleveland, Ohio.

The Izzard-Warren Co.'s Catalog

A neat little catalog of 48 pages has been issued by Izzard-Warren Co. of Philadelphia, Pa. These people are manufacturers of the "Sterling" surveying instruments and drawing materials. Their catalog is very complete inasmuch as it is profusely illustrated and contains detailed description of each instrument shown. The aim of the Izzard-Warren Co. is to market instruments that are in every way specimens of perfect workmanship and material. Their experience in this line covers a period of many years and their trade mark, "Sterling," well describes their product.

American Carpenter and Builder readers should possess this little book.

Universal Starts New Plant

The Universal Portland Cement Co., has started work on the construction of Plant No. 7, at Duluth, Minn. This plant will cost about $1,700,000, and will have an output of 1,400,000 barrels of Universal Portland Cement per annum.

Mr. Edward M. Hagar, President, states that work will be pushed as rapidly as possible, and it is expected that the plant will be in operation in 1914. With its present plants at Chicago and Pittsburgh this will give the Company a total output of 45,000 barrels a day, or, 13,500,000 barrels a year.

KISSELLKAR TRUCKS

Time and money saved to carpenters and builders

The record of this 1,500-pound KISSELLKAR Motor Wagon has made F. W. Wrampelman & Sons, Cincinnati, painters, wonder how they used to get along without it.

This same type is used by many carpenters and builders, although many call for one of the larger KISSELLKAR models.

Hills, cuts, chuck holes, heavy roads or slippery pavements do not worry KISSELLKAR Trucks. The long stroke motor, four speed transmission and differential lock take care of that.

No such emergency factors are found combined in other trucks. Some have one of them, some another—but none have all.

KISSELLKAR Trucks are good all the way through—every inch of construction studied—every principle tested, proved and verified—each part patterned to establish a perfectly balanced strength and stress-resistance.

There are seven chassis models of KISSELLKAR Trucks, each designed and built for a different duty. The smallest has a burden capacity of 1000 pounds—the largest carries 5 tons. Those between are rated 1 1/2, 2, 3 and 4 tons. Illustrated portfolio shows hundreds of KISSELLKAR Trucks in actual service. There is a copy for you. Send for it.

KISSELLKAR Trucks are good all the way through—every inch of construction studied—every principle tested, proved and verified—each part patterned to establish a perfectly balanced strength and stress-resistance.

What KISSELLKAR Service Means

A responsible institution agrees to take mechanical care off your hands, keep your car "tuned" up, and your depreciation down. And does it. KISSELLKAR Service Buildings and Stations everywhere.

Nickel or Chrome Vanadium steel—heat treated—fortifies each vital point in a KISSELLKAR truck chassis. Axles both of the heaviest forgings. Cone leather-faced clutch. Spicer Universal joints. Driver's comforts. Bodies built to suit.

Kissel Motor Car Co., 546 Kissel Ave., Hartford, Wis.

When Writing Advertisers Please Mention the American Carpenter and Builder.
CONCRETE-LIGHTING-STANDARDS

Offer the ideal means of lighting any street, business or residential, either in small towns or large cities. They are practical and artistic. A well lighted street increases property value, affords better protection and is a town's best advertisement.

 Beautify the Homes You Build
Install Concrete Lighting Standards along the private driveways; on either side of the gateway or the entrance steps. Place them in front of stores and public buildings. A well lighted street is the business man's best asset. You'll have no difficulty selling Concrete Lighting Standards. Everyone is interested in them.

 Make Bigger Money
Get acquainted with this modern system of lighting. It can be used in every city. Be the first to grasp this opportunity in your neighborhood.

 My Free Booklet
will tell you how easy it is. Send for it. It will help you double your income. I shall be glad to figure on any special designs of molds or standards that you may submit to me.

I save you money.

GEO. W. EDGCUMBE
177 Fair Avenue
The Post Man
Benton Harbor, Mich.

Carpenters! Protect Your Valuable Tools
by using a
"STANDARD TIME"
Keyless Chest Lock
Operated by knob in 3 seconds. Can be opened in the dark. Locks automatically as lid is closed.

Absolute Security
One cost only. No keys to lose. Fully guaranteed. Made to fit chests from 4 inch thick and up.

Write Us Today for Prices and Particulars
Miller Lock Co.
Frankford, Philadelphia, U. S. A.

Why Buy a Common Engine on Your Mixer?
WHEN YOU CAN GET THE
New Way Air Cooled Engine
WHICH ALWAYS
Goes and Goes Right

The New Way saves you money because your men are not idle waiting for engine to be fixed.

Time Lost is Money Lost.
Time saved by the New Way Air Cooled Engine is money made.

Demand the New Way Air Cooled Engine on your Mixer and Hoist and Accept No Substitute.

Quality and Reliability Count Always.

Write for Catalog "X"

THE NEW-WAY Motor Company
LANSING, MICHIGAN, U.S.A.
STANLEY'S
Wrought Steel Screen Door Hardware

W.R. No. 631
Roof Scaffold Bracket

A New Roof Scaffold Bracket

The illustration shows a scaffold bracket which is stamped from heavy sheet steel and is so designed that it can be placed on the roof in a few seconds. It will not give way nor split the shingles.

It will be seen that the bottom plate has four half-inch sharp projecting lugs which are forced into the roof when weight is applied to the bracket. The top plate is strongly hinged to the upright end of the bottom plate and has an extending arm against which the 2 by 4 rests. When a 2 by 4 is pushed against the extending arm, the two lugs projecting from the top plate are forced into the 2 by 4 and hold it securely in place. No nails are needed and the more weight placed on a bracket, the better it holds. These are usually placed about ten feet apart and two brackets usually will carry four men.

The Richards-Wilcox Mfg. Co., Aurora, Ill., are the makers of the device and will be glad to answer questions about it.

A Handy Weight Card

The American Sheet & Tin Plate Co., Pittsburgh, Pa., have issued a handy table by which the standard weight per bundle and the standard weight per square of their corrugated roofing and siding can be easily found. Our builders handling either sheet roofing or siding will find the table very handy to have above their desks and we are sure there will be many references to it. Suppose you write for a free card.

Selling Lumber "Freight Prepaid"

With characteristic western progressiveness Hewitt-Lea-Funck Company have been overturning tradition after tradition in adjusting their business to their direct-to-user policy, established about one year ago.

No one engaged in selling lumber and millwork to the user by mail has heretofore cared to undertake the responsibility of quoting delivered prices. Hewitt-Lea-Funck, however, have added this feature to their service and believe it only a question of time before all shippers of lumber will be forced, by the demands of their trade to take this step.

The Hewitt-Lea-Funck Company invite every reader of this journal to get their price lists. Address them at 623 First Ave., Seattle, Wash. They now ship lumber and millwork from three points: Seattle, Wash., St. Louis, Mo., and Shreveport, La., providing prompt service to all parts of the country.
76 Years
Experience

WHITE EDGE TOOLS

On behalf of his own satisfaction we want every carpenter and builder in the country to know and use WHITE edge tools. Backed by 76 years of successful manufacturing experience WHITE tools are today the standard for correct design, proper materials and extreme durability under constant usage.

The first cost of a WHITE edge tool may be a trifle more than that of the ordinary grade but it is as near a permanent and lasting investment as anything subject to wear may be. Most dealers handle WHITE edge tools. If yours does not, please send us a card telling us what you need and we will tell you where you may secure them and the price.

The L. & I. J. White Company
Dept. A
Buffalo, N. Y.

When Writing Advertisers Please Mention the American Carpenter and Builder.
A Business Booster that has Delighted Three Generations of Children

Thousands of business houses in every line have for years been putting out souvenirs, premiums and other inducements of one kind or another, designed to keep their memory green in the public mind.

Far removed from this class, yet outdoing all of them in its lasting popularity, is the famous, time-honored Berry Wagon which for over 40 years has been one of the proudest possessions of succeeding generations of children.

There is no corner of the world where this little wagon has not penetrated. It has been dragged along by happy children over the smooth roads of France, and the rough trails of the Australian bush; it has been the delight of the town-bred child and the chief joy of the southern pickaninny.

The photograph shows a group of the latter getting some of the most fun possible out of the Berry Wagon. And on file at the Berry Brothers' factory are photographs from almost every corner of the world. Today, the children who played with the Berry wagon when it was a new thing are grand-parents, but their grandchildren are just as eager to own one. The wagon stands today as one of the best examples of advertising value ever devised. Each year seems to increase its popularity. Berry Bros, the varnish makers, whose factories are in Detroit, Mich., distribute these wagons.

The Dillon Hoist

The Northwestern Barb Wire Co., of Sterling, Ill., have put on the market a simple and sturdy little hoist that will prove a valuable aid to our carpenters and builders. The Dillon Hoist, as it is called, weighs only 50 pounds, yet it has a lifting power of 5000 pounds.

From Factory To You

French's Mixture, "the Aristocrat of smoking tobacco," comes direct from factory to you. For pipe or cigarette. Words cannot do justice to the fragrance, richness and sweetness of French’s Mixture—the charming blend of North Carolina red and golden leaf. Examine it under a microscope and you will find it to be the cleanest and purest. Smoke a pipeful and you will tell your friends that French’s Mixture is the most satisfying and economical tobacco you ever tasted a match to.

50 Cent Calabash Pipe Free

Don’t pay your good money for stale tobacco from the dealers’ shelves. Get that pleasing, mellow French’s Mixture that comes direct from the factory to you. Hand-blended, un-pirated and exquisitely mellow. If you want to get more pleasure out of smoking than you ever got before, send 40c for ½ lb. of French’s Mixture (Granulated) or 4½c for ½ lb. of French’s Long Cut. Send now and we will include free a 50c Scotch Calabash pipe. Get real smoking pleasure. Take this opportunity of getting a fine pipe free.

Sample Pouches

Send the coupon or remittance for large sample pouches of French’s Mixture or Long Cut, and booklet interesting to smokers. Specify your choice of the Mixture or Long Cut.

FRENCH TOBACCO CO. Dept. 2418, Statesville, N. C.

J-M Mastic makes floors practically proof against acids, water and wear.

This flooring is all mineral, having a natural asphalt for its base. Water and acids have absolutely no effect on it. It is practically indestructible. Will outwear any other type of floor. Being waterproof, J-M Mastic floors can be quickly and thoroughly cleaned by the simple process of flushing. It dries immediately. Absolutely sanitary—will not originate or hold dust. Slipping is impossible on a J-M Mastic floor on account of its peculiar "holding" quality. Although dense, J-M Mastic has a resiliency which adds to the comfort and efficiency of those who are compelled to stand while at work, and it does not cause foot soreness and fatigue like concrete and other hard non-yielding floor surfaces. J-M Mastic can't be equaled for factory use. It is the cheapest per square floor.

H. W. JOHNS-MANVILLE CO.

When Writing Advertisers Please Mention the American Carpenter and Builder.
HERE IS YOUR FURNACE
The Only One for Low Cellars

This furnace can be placed in a cellar as low as five feet. It is a powerful heater. The two-flue radiator has a large surface to radiate every bit of heat. The exceptionally long fire travel guarantees perfect heating and no waste of fuel. In this construction you heat the house and not the air over it.

The Ajax Low Construction Furnace requires no pit. You get the proper pitch to the pipes even in a low cellar without one. The parts are so perfectly fitted that any man can set up the furnace and make a gas-tight and heat-tight job. Large feed doors allow burning of large chunks of wood. The grates slide out easily—no bolts or screws.

We want every carpenter and builder to consult our special service department on all their heating problems. Advice free. Send for Catalog and Price List of our Complete line.

Dept. A, CO-OPERATIVE FOUNDRY COMPANY
ROCHESTER, NEW YORK

Western Branch, 505 So. Clinton Street, Chicago, Illinois

CON-SER-TEX CANVAS ROOFING
Ignores the Elements Defies Wear

Carpenters and Builders, for years you have experienced trouble, dissatisfaction and needless labor in applying Duck for porch Covering.

Then, after laying, the canvas soon buckled, split and rotted, resulting in constant complaints.

WE SOLVE YOUR PROBLEM!!

Con-Ser-Tex Canvas Roofing reaches the seat of your trouble. It is of special construction, fibre-treated to prevent mildew and surface coated with non-oil ingredients to keep applied paint from injuring the fibre.

Write us for detailed particulars, prices and instructions as to just how to apply it. Full information mailed free—and we can show you how and why you can profitably make use of Con-Ser-Tex.

William L. Barrell Co., 8 Thomas Street, New York City

Chicago Distributor GEO. B. CARPENTER & CO., Wells and Michigan Streets

Electric Light from Kerosene!
Sandow Light Plants use kerosene as fuel and furnish electricity for almost nothing. Cheap to buy and cheaper to run. Sold on trial and absolutely guaranteed. Bulletin 300 describes an electric light outfit to suit your needs and your pocketbook. It's free.

DEPT. B, MOTOR CAR SUPPLY COMPANY, DETROIT, MICH.

“Woodlife” Buy Good Paint Direct

Is least expensive and most durable A “Natural” shingle stain, guaranteed for five years. It is durable, economical and artistic. Can be used in any shade. Liquids and colors separately packed. To be mixed as needed. Widely used by architects and builders for shingled houses, bungalows and all rough wood. Write for particulars.

Chas. H. Brown Paint Co. 190-192 Montague St., Brooklyn, N.Y.

AND SAVE 50c A GALLON

30 years' experience, a modern factory, pure materials and selling direct is why it will pay you to buy

BROWN SEAL Prepared Paints

Shipped on approval. Write for color card and prices.

The Yuma Paint Co.
462 East First Street
DAYTON, OHIO

When Writing Advertisers Please Mention the American Carpenter and Builder.
Neponset Wall Board

Word has been received from F. W. Bird & Son, East Walpole, Mass., that Neponset wall board is now being made in cream white and burnt leather finishes as well as in the original plain oak. With these three finishes many attractive combinations can be made with Neponset wall board. The usual arrangement is to use plain oak for wainscoting and finish upper walls with either the burnt leather or cream white finish and to use cream white on the ceiling.

Battens in cream white and in plain oak finish are made of the same material as the wall board. These battens of course are much less expensive than wooden battens and being of the same finish harmonize well with the wall board. On ceilings especially these white battens are very useful.

In order to prevent buckling the surfaces of Neponset wall board have been thoroughly waterproofed.

Neponset wall board is being used in all kinds of new houses, in camps, garages, barns, etc. It has also been used in remodeling old houses, in unfinished rooms or over the old plaster. For partitions as well as for walls and ceilings, in offices, factories and railroad stations, and for backing store windows it has proved to be very successful.

Catalogue or booklet upon request, including attractive prices. For full particulars address F. W. Bird & Son, East Walpole, Mass.

Woolridge Architectural Co. Opens Sioux City Office

On February 8th the Woolridge Architectural Co. of Correctionville, Iowa, opened an office in the Willeges Bldg., Sioux City, Iowa. Mr. J. R. Woolridge, of Sioux City, Iowa, is president; J. H. Woolridge, of Correctionville, Iowa, vice-president, and I. I. Woolridge, of Sioux City, Iowa, secretary and treasurer.

Flushing Valve Does Away with Tank

During the past few years there has been a marked evolution in sanitary appliances and accessories, the trend being toward simplicity of design and construction. One of the most conspicuous examples of this tendency is the gradual abolition of the toilet flushing tank, with its complicated mechanism, in favor of the flushing valve.

But while the flushing valve, by its neat outward appearance conforms to modern ideas of sanitary equipment, its advantages have heretofore been offset by several serious mechanical objections. To overcome these objections an extremely simple flushing valve, known as the “J-M Valve” has just been put on the market by the H. W. Johns-Manville Co., New York.

This device is designed for use in connection with toilets, slop sinks, etc. It is furnished in three sizes—½ in., ¾ in., 1¼ in.—and is guaranteed to control the flow of water and give a proper flush and refill where the water pressure at the valve is 10 lbs. or more.

The manufacturers claim that this device will properly flush any fixture that requires a regulated or timed flow. And as it has only two moving parts it is said to be the simplest and most efficient flushing mechanism on the market.

It can be installed in any position, upright, horizontally or at an angle, without interfering in any way with its satisfactory operation.

When Writing Advertisers Please Mention the American Carpenter and Builder.
Service for "Our Folks"

One of the most honorable of the old mottoes that have come down to us from feudal days, is that which is a part of the crest of the Prince of Wales—"Ich Dien" meaning I serve.

A glance at our front cover this month reveals this old motto in its modern form—SERVICE FOR "OUR FOLKS."

Service is the foundation stone of the AMERICAN CARPENTER AND BUILDER. We believe in big, honest values and a square deal for every subscriber and every advertiser.

We are glad that America's enterprising, trustworthy builders, architects, and carpenters have in the past responded so heartily to our offers to serve them that our business has warranted this present enlargement and removal into our new home.

But we feel good about this, not because it will be "the biggest and the best," but because in our new home we will be able to serve you better, to render bigger and better service for "Our Folks."

We have had one of our best artists better this drawing so that the first thing you see are the words, "Service for Our Folks." Of course, we do count on the loyalty, the friendship of our readers, and value more than tongue can tell, but after all, it is by the test of real value and service rendered by which we want to be judged.

Book of 1004 Pages for $1.00

VOLUME XIV of the AMERICAN CARPENTER AND BUILDER (six numbers, Oct., 1912, to April, 1913), makes a book of 1004 pages. That's a pretty good reference library for builders themselves, isn't it? Your binder for this book will only cost $1.00 (or less). This is certainly the biggest buy we know of in the building book line. The volume index which went out as a supplement with the magazine last month, makes everything contained in these six numbers handy to refer to. More than a thousand topics are listed in the volume index. Looking over the subject index, one is amazed at their great variety and how completely they cover the building field.

Make the best use of this volume index by binding up your volume XIV and pasting this index into the front of it. Do this now, before the index gets lost.

How Do You Like the Binder?

EVER since the announcement in the April issue, we have been shipping out to our readers, those special binding covers. We are using a set of them here in our editorial rooms and we think they are the finest magazine binder we have ever seen. We don't know how it could be made any better, stronger, easier to use, or more attractive in appearance. We hope you will all like them. We still have a good supply of these binders on hand for those who have not yet ordered. Turn now to page 84 for full particulars about ordering.

Thanks, and the Same to You

Harmony, Neb.

Editor American Carpenter and Builder:

Enclosed find $2.00 to renew my subscription. I have given my magazine but a year's trial. However, in that time, I have derived so much benefit from its generous pages that I would not be without it and would not miss a single issue. My best teacher is the American Carpenter and Builder. A single issue has more than once saved or made me many times more than the actual subscription has cost.

I file away every copy and treasure them highly. I have corresponded with many of the advertisers and have so far found each and every one of them true to their word. I wish the American Carpenter and Builder every success.

Your subscriber, Jas. D. Nowak.

We are human. We like to get letters like this. And we get lots and lots of them. We are particularly glad that our subscriber has found the American Carpenter and Builder advertisers all true to their word. That has been our own experience with them, also. Our readers will get special attention too if they will always mention to advertisers that they belong to our Big Family of Subscribers.

Are your needs all supplied and are you fully posted for the Spring and Summer building trade? Write now for booklets, catalogs, samples and prices. Fraternally yours,

Jas. D. Nowak

Editor AMERICAN CARPENTER AND BUILDER.
A SUGGESTION

Do you specify a spring hinge with distinctive features which will appeal to your client and assure satisfaction to all concerned?

Chicago "Triplex" Spring Butts offer this advantage to you. The appearance, durability and finish of this article are unsurpassed, and in consideration of prices that are conservative in respect to value, the up-to-date builder cannot afford to risk his reputation with goods that are unsatisfactory.

Send for Catalogue C 29. It illustrates and describes the most complete line of Spring Hinges manufactured.

Chicago Spring Butt Company

CHICAGO NEW YORK

Set Your Saw Right... If you want to take the wrong set out of your saw and put in the right set at one operation you should use the

MORRILL SAW SET

A mechanically perfect Saw Set that will set any Saw not over 16 gauge.

Look for the Trade-Mark Apex

Chas. Morrill
275 Broadway
NEW YORK

Make Your Houses Frost-Proof by lining them with
Cabot's "Quilt"

It is cheaper to build warm houses than to heat cold ones. A cold house will waste enough coal in two winters to pay for enough Quilt to make it warm for all time. Quilt is not a mere building paper, but a genuine insulating material. When used in the construction of walls as a lining it is twenty-eight times warmer than common papers. It will make your house warm in winter and cool in summer, cut down your doctor's bills and keep the whole family comfortable. It is applied by the carpenter only if a house, will never rot or disintegrate, nor prevent the free circulation of air; will cost you a pittance—which will bring you a handsome and the grocer. Will you write now?

Residence of Walter M. Collins, Builder, Bayside, L. I., lined with Cabot's Quilt, and what the owner says:

"The side walls are of tufted four in. red cedar shingles, finished with your Special Grey and laid over your single ply Quilt. The Quilt is certainly a good investment, as the house is in a very exposed position, and after the hardest winter in years, without a frozen pipe or any difficulty in heating. I feel that the small additional cost (our insurance company having recently been saved in coal and comfort."