American Carpenter and Builder readers are the men who are called upon to recommend, specify, and use the various materials and special equipment needed in modern building. They are keenly interested in all labor-saving and comfort-making appliances for the home. Knowing this, I have had this Special Home Equipment Number prepared. In it you will find some very interesting articles dealing in a practical way with Modern Heating, Plumbing, Systems of Lighting, Water Supply—both Cold and Hot, and other Special Utilities for the well-equipped dwelling.

Editor-in-Chief
TRY BEFORE YOU BUY

Let us send you the “LITTLE GIANT”—Freight Prepaid
Absolutely FREE of any expense to you whatever

A request from you brings the “Little Giant” to your door—you send no money and we pay all expenses. After you have given it a fair trial and have tested it as thoroughly as you know how, and have found it satisfactory, pay for it. If you do not think it is the best floor scraper made, return it.

TRY IT ON YOUR OWN FLOOR

You can try the “Little Giant” on your own floor and the trial costs you nothing. All that we ask is that you give it a fair trial. You be the judge and jury. Every carpenter and contractor can afford to invest in one as the time and money saved will pay for the machine in a very short time. By using the “Little Giant” you will be in a position to estimate much lower than your competitor and therefore have more work. Can you afford to be without this machine?

20,000 “Little Giants”
are in use throughout this country and abroad. These were purchased because they were better; because they did more work—did it quicker, cleaner and cheaper—than any other machine made. So great is our faith in its ability to prove its worth to you that we are making the above liberal proposition.

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31 South Clinton Street, CHICAGO
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“THOR” MODEL HOME ELECTRIC LAUNDRY
(Operated from any Electric Lamp Fixture)

Over 9,000 Homes now use the “Thor” for Washing, Wringing and Ironing Their Clothes.
No change required in your home.

The “THOR” Electric Home Laundry Machines are on the cylinder principle just like the large laundry machines but are built especially for home use. Made in two sizes. Will last a lifetime. Write for booklet.

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Chicago  New York  San Francisco
31 S. Clinton St.  1011 Flatron Building  73 First Street
ON THE JOB
OR IN YOUR SHOP

These portable saw rigs will do all of your millwork and can be moved from job to job with ease. The engines furnished with these rigs are strong and water-hopper cooled. The rigs, ready to start when they reach you, include cross-cut and rip saws, dado head for plowing window and door frames, belt tightener, emery wheel for sharpening your tools, wrenches, etc. Two years were spent in getting these rigs to balance perfectly, and there is a total absence of vibration.

The All-Iron Rig, as shown here, weighs 1150 pounds, crated—the Engine being a strong six-horse, and pulls 14-inch saws.

These two Rigs are strong and will stand the very hardest kind of usage. They make you independent. We absolutely guarantee these outfits or return at our expense.

WRITE FOR OUR FOLDER AND ATTRACTIVE PRICE

Inter-State Equipment & Engineering Co.
Old Colony Building :: :: :: :: CHICAGO, ILL.
THE NEW SASGEN CIRCLE SWING DERRICK

Light in weight, speedy in operation, all malleable castings; weight 250 lbs., capacity 1000 to 1500 lbs.

Fully equipped. Ready for use. $35.00

Sold on trial to all reliable contractors. Catalogue FREE.

Manufactured by SASGEN BROS.,
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THE HAVEN FLOOR PLANER

HERALDS THE NEW ERA IN FLOOR SCRAPING

Eliminates all defects found in other floor machines. Does away with the man-killing toil of the heavy-weight machine. Makes floor scraping simple and agreeable. It embodies the mechanical principles of the plane. Planes and scrapes floor at one operation. Does better work than most hand work. "Wavy" floors prevented. Most rapid scraper on the market.

Be an agent in your locality for the floor planer of the future.

Particulars on request.

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WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
OUR 1910 MODEL—Just Out

The ANDERSON SPRING-DRIVEN AUTOMATIC ADJUSTABLE FLOOR SMOOTHER

WITH ATTACHMENTS AND ACCESSORIES

Meets every demand of practical men for a machine that will scrape and sandpaper a floor and do it right. It has all of the ready adjustability of a hand-scaper—the necessary weight to keep it from jumping, and the motive power to enable the operator to do ten times the amount of work that can be done by hand.

Guaranteed to do satisfactory work on all kinds of new or old floors.

Will scrape a varnished or painted floor cheaper than it can be cleaned with chemicals and leaves a smooth even surface in the one operation.

Just the thing for the Contractor and Builder, Painter and Floor Finisher, Skating Rink Owner, Bowling Alley Man, or the owner and operator of Flat Buildings and large public and private institutions.

Assorted knives and special attachments to meet every requirement in floor smoothing work, can be had with the TRIPLE "A" OUTFIT.

Let us know your needs, or the class of work you have to do and we can furnish you with the proper equipment. In buying the Triple "A" outfit, you are not compelled to pay for a lot of junk you have no special use for. The machine and each attachment has its separate price and purpose. You buy only the things you actually need in your line. Simply write and tell us what business you are in and what you wish to do in the line of floor surfacing and we will send you illustrated literature on the best equipment on the market for your particular kind of work.

Each machine is regularly equipped with our Automatic Motor Spring, two Detachable Weights, an Adjustable Knife Clamp and Attachment Holder, and the following accessories: six 4½ by 8 inch solid steel knives (containing no slots). These knives are assorted as to thickness and the radius of the edge, and are especially adapted for the various classes of Floor Scraping. Also—two Files (one coarse and one fine); one Oil Stone; one Burnishing Steel; one Wrench and Handy Tool Kit for the above.

In addition to this our 1910 MODEL is equipped with a Safety Guard which prevents any possibility of leaving knife marks on the floor. With this, an inexperienced operator cannot fail to do good work.

Any or all of the Following Attachments can be furnished and used in connection with our TRIPLE "A" FLOOR SMOOTHING OUTFIT.

The A. A. A. Knife Sharpener with which anybody can secure a true, perfect cutting scraper edge. Used without removing the knife from the smoothing machine.

The A. A. A. Smoothing Shoe Attachment, used principally for truing up Bowling Alleys and Parquette Floors and wherever a true level surface is required on ordinary floors. Acts like the shoe of a plane or cabinet scraper and is quickly adjusted to the machine.

The A. A. A. Sand-Papering Attachment, the use of which we recommend when an extra fine finish is required. Adjusting this attachment to the machine is no more bother than to change a knife. The A. A. A. Sander works with a rocking motion which automatically clears the dust from the sandpaper and prevents choking up.

Every outfit insured by our guarantee to keep it in free repair for a year should anything unlooked for occur.

Write us today for illustrated literature and special trial offer of the most complete floor surfacing outfit on the market, or let your dealer order it for you and save the bother.

TRIPLE "A" MACHINE CO., 1020 Chicago Opera House Building
CHICAGO, U. S. A.
"A Bit Of Utility"

Guided by its circular rim—instead of its centre—the Forstner Labor-Saving Auger Bit will bore any arc of a circle, and can be guided in any direction.

Doesn’t matter how hard the wood is, no consequence whether it is full of knots, or the grain awkward to negotiate. The Forstner Bit works with equal smoothness under any condition and leaves a true polished surface on every job.

Unequaled for Delicate Work

Supersedes chisels, gauges, scroll-saws, or lath tools combined, for all kinds of delicate work. Cabinet and pattern makers and carpenters are enthusiastic because they do more work than other bits and cost no more.

We can offer something special in the matter of price on sets packed in a sensible box. Send today for particulars and catalog.

The Progressive Mfg. Co.
Torrington, Conn.

"THE PORTER" Wood Turning Lathes

for wood turners and pattern makers. Furnished complete with countershaft, rests, steps, bolts, center and face plate. A high grade machine at a reasonable price. We also make Hand Jointers, Shapers, Swing Cut-off Saws, Pony Planers and Post Boring Machines. Better get our Catalog.


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Don’t cut holes in the storm window frames. Hang them with Gossett Hinges and swing them out at the bottom for ventilation. Special fasteners lock them securely, opened or closed. Easily put in place, just hook them on. No tools or ladder needed because of the PATENT GUIDE FLANGES

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F. D. Kees Mfg. Co.
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BEATRICE, NEB.

The World’s Best SAW BENCH

This machine is a dandy. It is strongly built. The arbor moves up and down in an arc so that the belt is always tight. Equipped with four gauges, two saws and counter shaft, including our splendid gear operated double acting, tilting, ripping fence.

Send for complete catalog of Saw Benches.

THE CRESCENT MACHINE WORKS
38-50 South Front Street, Grand Rapids, Mich.
Before investing your money in a Floor Scraper. You want the best, don't you? Then let me send you an Acme Floor Scraping Outfit on a Week's Free Trial.

If the same is not satisfactory, send it back.

Remember, the Acme Floor Scraping Outfit is the only complete equipment on the market to-day.

Booklet and further information mailed on request.

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The difference between good and indifferent Carpenters' Squares lies in something more than excellence of material and workmanship, which are, of course, among other "Sargent" features—it is in the qualities that increase its all-round efficiency. That is why the practical "Sargent" Standard Steel Square is the universal favorite wherever Squares are used.

Our latest model has the scales and markings which enable the carpenter to lay out all kinds of work and to calculate quantities with an ease and accuracy never before thought possible. "A practical treatise on Steel Square" is what several recipients have declared our little publication. Copy free simply by mentioning you saw this ad in the American Carpenter and Builder.

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**The Best Ever**

You Will Never Regret Buying One

Wide Heel Brick Trowel
Made of Best Quality Crucible Trowel Steel. Leather Handle.

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Best Quality Crucible Trowel Steel. Wood Handle.

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Marshalltown Trowel Co.,
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**REMOVAL NOTICE**

* ISZARD-WARREN CO., Inc.

We beg to announce to our friends and customers that owing to the rapid growth of our business we find our present quarters inadequate for our requirements.
On November 1st we open our new four-story building at 136 North Twelfth Street where will be located our entire Manufacturing Plant, Salesrooms and Offices.

We extend to you a cordial invitation to visit us, affording us an opportunity to demonstrate the perfect construction and extreme accuracy of "STERLING" Surveying Instruments.

Very Respectfully,

ISZARD-WARREN CO., Inc.
Address after November 1st.—136 North Twelfth St., Phila., Pa.
You can see just how the blades on The Weber Double Acting Floor Scraper are perfectly adjustable.

You can set your blade at the right angle easily and quickly, it makes no difference what the wood may be, Maple, Oak, Yellow Pine, Fir, etc., and you will do perfect work. The patented adjustable blade holder is an exclusive feature of the Weber, making it, without exception, the only perfect floor scraper made.

The blade holder is attached to a flexible frame by means of half-ball-and-socket bearings—this absolutely prevents chattering and leaving waves in the floor.

It scrapes close to the baseboard—is double-acting. There are always two knives attached, either one ready for instant use, saving 50 per cent in time over any other floor scraper made. May be fitted instantly with a Weber Sander Attachment, a Weber Wax Polishing Brush, or a Weber Shearing Cut Attachment—all of which are absolutely guaranteed.

Try it 10 Days FREE I'll pay the freight

Not only that Mr. Contractor—send for any number of other floor scrapers and make comparison yourself. Try them on any kind of hardwood flooring, Maple, Oak, Yellow Pine, Fir, etc., and if you don't find the Weber to be the best, send it back—you won't be out a cent.

The Weber Automatic Sharpening Device keeps the knives in perfect condition without removing them from the machine.

Write for descriptive booklet and Price List—but don't buy a scraper until you have seen the Weber in action, or tried it yourself—and compared it with others.

670 71st Ave.
WEST ALLIS, WIS.

ACKERMANN

Floor Scraper

If you are a carpenter, builder or contractor you need the Ackermann Floor Scraper. If you want a machine to scrape floors the Ackermann means more to you than a "machine on trial."

We have given more attention to the working parts than the selling points, We keep improving the machine—not the way to sell it. But—you can use an Ackermann Floor Scraper at our expense. We ship at our expense to prove the machine is what you want. And, if you can show that the Ackermann does not do more work, easier work and better work than other floor scrapers, you get the machine free.

J. B. Ackermann Co.
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GRAND RAPIDS,
MICH.

Knife Sharpening Device

A new feature is the Ackermann New Knife Sharpener—which insures a sharp edge all the time and which works automatically. It means a big saving in time and labor.

The request brings the machine to your shop for you to use free.
It always pays to buy the best tools for not only will they do better work and give better satisfaction in the beginning, but the durability of superior materials will make them outlast the cheaper kind.

GOODELL-PRATT TOOLS are designed by expert workmen for the use of expert workmen. They are made from the highest grade of material carefully selected for the work it is to do.

The thorough workmanship and the handsome lasting finish of our tools are well known to most carpenters. To those who do not know us we offer our catalog free.

GOODELL-PRATT COMPANY Toolsmiths
GREENFIELD, MASS., U. S. A.

Remember—THE FOX PAYS FOR ITSELF

Your hardware dealer will order it for you. They all handle the Fox Floor Scraper because it does better work and more of it in less time than any other machine on the market and is conceded by all to be the easiest running machine ever built.

Fox Cabinet Scraper

Fox Cabinet Scraper works like a plane. A FINE TOOL for fine work. Price, express prepaid, $1.25.

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2,000,000 ft. new and second hand lumber at $8 per M. ft. and up. 24 gauge galvanized iron corrugated roofing, $2.50 per 100 sq. ft. 24 gauge black iron corrugated roofing, $1.50 per 100 sq. ft. Rubber roofing, 100 sq. ft., with nails, etc., $1.10 per roll. All sizes in pipe valves, fittings, etc.

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Do Your Own Millwork!!

Stop paying somebody else profit—put it in your own pocket. Be in a position to estimate below your competitors. You can do this by installing your own Machinery.

Money-Saving Machinery

The contractor and builder who installs his own woodworking machinery can easily estimate under his competitors. Modern economic conditions demand it. Money you expend in millwork is profit for somebody else—the profit that rightfully belongs to you.

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For a small investment contractors can obtain sufficient machines from us to make them independent. We have new machines, direct from manufacturers, and many rebuilt machines as good as new. 500 machines are constantly in stock at our warerooms.

Prices are Favorable

Our line is the most complete in the country and our prices are most favorable. All our machinery is of special construction to secure fine finished surfaces and reduce sandpapering to the minimum.

Send for Lists and Circulars

Our monthly list of rebuilt machines (free to contractors) shows just the machines you ought to have. Write today.

Chicago Machinery Exchange

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WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
The American Floor Surfacing Machine

The American Floor Surfacing Machine is the original and only two-roll, self-propelling, dust-collecting machine, protected by U.S. and Foreign patents, and the only one that will satisfactorily surface any kind of a wood floor, and has been in general use by contractors, hardwood floor companies and others for over five years.

Its work is rapid, regular, smooth and even, because the power that drives the rolls propels the machine at the same ratio of speed.

Its work has established the standard for surfaced floors, and the only machine whose work is specified by leading architects and meets the requirements of contractors, owners and hardwood floor companies for finely finished, smooth, even floors.

It has surfaced and polished millions of square feet of the finest floors in America and Europe.

Don't be fooled with an imitation, but get a machine that does work in paying quantities, and can be operated in small rooms.

The only one whose construction is guaranteed and sold on its merits. Write for our book "Surfacing Floors as a Business."

Manufactured by
The American Floor Surfacing Machine Company
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PORTABLE COMBINATION WOODWORKER

GAS, GASOLINE or ELECTRIC POWER

Rip Saw
Cut-off Saw
Jig Saw
Dado Head
Molder and Shaper
Jointer
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Boring Machines
Emery Wheels

We Furnish Machine, Engine and Tools Complete.

Used by Contractors, Lumber Yards and Railroads Everywhere

A practical machine for every contracting builder, jobbing shop, cabinet maker, etc., combining nine machines, so assembled that they do not conflict. Large table surface.

The power, 4-H. P. Engine, is rigid in the frame and machine can be used in the shop or on the job.

Send today for circular fully describing the best combination woodworker ever built.

C. A. & F. G. Diffin
Builders’ Exchange
PHILADELPHIA, PA.

THE BIT THAT’S FIT FOR EVERY PURPOSE

Bores smooth and clean without choking or splitting

The Bit Made Of GENUINE CRUCIBLE STEEL

Look for RUSSELL JENNINGS ON THE ROUND MANUFACTURING CO.
CHESTER, CONN., U.S.A.

FIRST QUALITY ONLY
Put On The Market

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Hand and Pool-Power MACHINERY

Our No. 3 Wood Turning Lathe can be speeded from 1,000 to 2,000 revolutions a minute with perfect ease. Stopped or reversed at will of operator.

Write for Particulars

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Bores smooth and clean without choking or splitting
The "55" Plane will do a greater variety of work than can be done with a full line of so-called Fancy Planes. It is 10 inches long, weighs only 7.5 lbs. (with 93 cutters—11 lbs.) and replaces practically the complete line of Fancy Planes weighing probably 90 lbs. The regular equipment sent with this Plane comprises the 52 Cutters marked . A further line of 41 Special Cutters is regularly made. Send for Catalog containing complete description.

It's Up to You, Mr. Carpenter,

To see that the Dealer furnishes you with the NICHOLLS FRAMING SQUARE, which is the first Framing Square ever put on the market. All others are imitations. If it were not a good thing, why should they imitate it? We have learned of late that some dealers say there is no such Square made; others say they cannot get them. Well, we wish to say they can get them for you, and if they will not, we will furnish them to you direct from the Factory and prepay the freight.

NICHOLLS MFG. CO., Ottumwa, Iowa
FAR AHEAD for smooth, easy work and holding edge will be YOUR VERDICT ON TRYING

CHAPLIN'S IMPROVED PLANES

Patented Feb. 14, 1899; Dec. 30, 1900; Dec. 24, 1902

We invite the
Severest
Comparative Tests

Tower & Lyon Company, 95 Chambers Street, New York

YOUR SHOP EQUIPMENT

should include a Crescent Variety Wood Worker and a Crescent Band Saw. With these two splendid machines you can do any ordinary job of wood work that is brought to you. Both machines are well built, will give you entire satisfaction, save money for you, and you will be surprised to known how reasonable the price is.

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224 Main Street

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Dorn's Revolving Mitre Box

Saw compound as well as plain mitres any width with a back saw 4 inches wide.

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IT TELLS THE STORY

MANUFACTURED BY

Braunsdorf-Mueller Company

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“YANKEE” Breast Drill
with Automatic Double Ratchet
Adjustable Ball Bearings

Notice the little shifter between the gears:
- Notch 1—gives you a plain drill.
- Notch 2—A Left Hand Ratchet for removing taps, etc.
- Notch 3—A Right Hand Rachet.
- Notch 4—An Automatic, Alternating Right and Left Hand Rachet, the bit turning continually to the right regardless of the motion of the crank. A great advantage at close quarters where only a short throw of crank can be obtained. A true time saver.
- Notch 5—Locks drill for opening and closing chuck.
- Lever A—Change of speed with forefinger, without releasing hold on crank or removing bit from hole.

Your Dealer sells “YANKEE” TOOLS

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This hook bolt can be inserted or removed through a one-inch hole bored in the sheathing. It hooks around the studding. Where it is desired to plaster inside before scaffold is down, a piece of 2"x4" turned flatwise may be used to fill in.

If you should wish to try a pair before ordering in quantity, write for terms of our special offer.

If this hook bolt can be inserted or removed through a one-inch hole bored in the sheathing. It hooks around the studding. Where it is desired to plaster inside before scaffold is down, a piece of 2"x4" turned flatwise may be used to fill in.

WHERE

THEY ARE

BETTER THAN

WOODEN BRACKETS:

They are absolutely safe; much easier to put up and take down—it only requires one man; a great deal stronger—each pair of the smallest size carry a ton weight; far more durable—consequently, decidedly cheaper; they last a lifetime.

Made of best quality angle steel in following sizes:

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<thead>
<tr>
<th>Length</th>
<th>Size Steel</th>
<th>Price per dozen</th>
</tr>
</thead>
<tbody>
<tr>
<td>48 inches</td>
<td>1½x1½</td>
<td>$15.50</td>
</tr>
<tr>
<td>60 inches</td>
<td>1½x1½</td>
<td>20.00</td>
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Less 10% for cash with order, deliveries—F. O. B. Bloomfield, N. J.

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Let us tell you about The Taylor Quick-Acting, Self-Locking. 21 different styles.

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Are made from a High Grade of Tool Steel, Skillfully Treated, Correctly Tempered, Accurately Ground.

Every "Ohio" Tool is fully warranted. They have been on the market a great many years and the experienced mechanic who does not care to take any chances on tools of doubtful quality always insists on having "Ohio" Tools from his dealer. He knows them to be good tools, with keen and tough cutting edges.

Look for this trade mark when buying Planes, either Iron or Wood, Chisels, Drawing Knives, Auger Bits, Gouges, Spoke Shaves, Bench and Hand Screws, Cabinet Makers' and Manual Training Benches, Etc. Write for our Catalogue No. A, if you are interested in GOOD TOOLS.

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MADE ESPECIALLY FOR WOOD WORKERS

FOR SALE BY L. DEALERS

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MERICAN CARPENTER AND BUILDER

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Disston Saws are manufactured from Disston Steel — this steel and the shop treatments it gets have made the Disston line of Saws and Tools famous.

THE HIGHEST AWARDS—Grand Prix, and Gold Medals—
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FREE — THE DISSTON handbook on Saws. Interesting and valuable. Sent for a postal to anyone who uses a saw.

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(Keystone Saw, Tool Steel and File Works)
PHILADELPHIA, U. S. A.

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We want you to know that we carry a complete line of BUILDERS HARDWARE, including all the latest designs and finishes in stock.

FREE our latest catalogue and net price list to contractors, and material men.

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PERFECTION DOOR LOCK MORTISER
Makes a perfect mortise without break and bit or chisel — The only mortiser of its kind in the world. Worth its weight in gold to the twentieth century carpenter and carpenter. You cannot afford to be without it. Automatic, bail bearing, will cut any size mortise, any size bit finished.
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JOIST HANGERS
For Wood Timbers, Concrete Blocks or Iron Beams.
Many Sizes in Stock
Special Shapes to Order
Steel Post Caps, Wire Floor Clips, Straps, Bolts, Pin Anchors
Blacksmith Work and Iron for Carpenters' Requirements

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Straight-grained cedar that cuts like cheese; smooth, tough leads that make clean-cut, strong marks—that's the way Dixon's Carpenter Pencils are described. Send 16c for generous sample lot 183 J.

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SAMSON SPOT SASH CORD

Be sure that the cord you buy has SAMSON AND THE LION on the label, and that the braid is marked with the COLORED SPOT. You may be sure you'll get the best.

WE'RE GLAD TO SEND SAMPLES AND FULL INFORMATION.

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HERE'S an improved hand nailing tool that can be used for driving small nails and is especially adapted for driving shingie nails. It is operated as easily on a pitched roof as on the level surface. No slipping nails, no bruised fingers, no loss of time and temper.

No trouble to handle, because it weighs only about two pounds. Can be used with gloves or mittens on and in any season.

No. 225-A Single End Tenoner

THE BEST SINGLE-END TENONER

The Framing is cast iron, therefore very rigid.
The Table is mounted on Roller Bearings, hence will move very easily and accurately at all times.
The Cutter Spindles are all made of high carbon steel, ground accurately to size and perfect roundness.

FOR FURTHER PARTICULARS, ADDRESS
H. B. SMITH MACHINE COMPANY
SMITHVILLE, N. J., U. S. A.

COMPO-BOARD

A substitute for Lath and Plaster.
Can be put on by any Carpenter.
It is Warmer, more Durable,
Quicker and more Easily Applied.
Manufactured all 4 ft. wide, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 and 18 ft. long.

For Sample, Price and full Description, Write
Northwestern Compo-Board Co.
4800 Lyndale
MINNEAPOLIS, MINN

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
"Last a Lifetime and Give Satisfaction To The End".

BUTT CHISEL

The celebrated Barton Planes and Edge Tools for carpenters and all other woodworkers are unequalled by any other make for keen, hard smooth cutting edges. If your hardware dealer does not handle the celebrated Barton Tools, substitute, as our name is stamped on every foot of cord. Silver Lake Sash Cord is the Original Solid Braided Cotton Sash Cord, and has been the standard since 1868. No other is just as good.

Huther Bros. Patent Groover or Dado Head

Can be used on any Circular Saw Mandrel.

For cutting any width groove from 9/16" to 2" or over. Will cut a perfect groove, either with or across the grain, and have a very smooth. Will also cut a perfectly square groove. Will be used by all carpenters. By any responsible manufacturer you are at liberty to return at our expense. We also make a specialty of concave ground, smooth cutting circular Mitre Saws, for either rip or cross-cutting, etc., and with additional attachments, rabbiting, grooving, dadoing, boring, scroll sawing, edge moulding, beading, etc.

No. 5 "Union" Combination

Self-feed Rip and Cross-Cut SAW

(April 22nd a complete workshop in one machine.)

THIS MACHINE is suitable for various kinds of work—ripping, cross-cutting, mitering, etc., and with additional attachments, rabbiting, grooving, dadoing, boring, scroll sawing, edge moulding, beading, etc.

The heaviest, most substantial, accurate and easiest running machine of its kind on the market.

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can be used anywhere. It forms a perfect, practicable lock; sash hung with it cannot be opened or removed from the outside; it cannot be blown open by storms; makes practicable the only substitute for the half-sash sliding screen; is sold in sets, half sets, or in any other way the trade demands; indestructible; will outwear a dozen screens.

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The "AUTOMATIC" SASH HOLDER

The "Automatic" Sash Holder is the new, modern, up-to-date device that dispenses with cumbersome sash weights, kinking cords or ribbons, useless weight pockets, misfit pulleys and reluctant balances, and saves all the time, labor and expense of fitting them in place.
Prevent rattling and permit the window to be moved up and down with ease. Hold it safely at any point desired.
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Ask your dealer, or write to us direct.

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Fine Hand Made Hand Saws

The Purest of Quality Our "GREYHOUND" Hand Saw

In introducing our "GREYHOUND" brand of Saws to the trade, we have departed from our usual custom in naming instead of numbering the saw. This saw will be known as our "GREYHOUND" and will be the only Bishop brand of saw known by name.

We have had a Chemist experimenting for years to originate a purity of steel with a fine grain and tough body that would stand up under such a fearless warranty as we place on our "GREYHOUND" brand of saws. We now have it. We know its worth as well as its value. As workers of steel we understand it. We had to name it and we have christened it Bishop's Refined "GREYHOUND" Steel, associating our trade mark with its name. We have in this "GREYHOUND" Saw blade a purity of steel that is tough, tempers accurately and even—toogether with the special way it is made—enables us to guarantee that this "GREYHOUND" brand of Saws will cut faster and run easier in all kinds of wood, hold its sharpness and set longer than any other makes of good Saws in the world. We Refund the Money if 30 days' trial does not prove our guarantee. Our pride is quality with an honest opportunity for the purchaser to judge. Each Saw is tagged with our warranty on it. No expense has been spared to make this Saw the most perfect in the world. We invite correspondence with anyone who has our "GREYHOUND" brand of saws in use.

Made in both straight and skew back. Packed One in a Box.

In workmanship this saw possesses all the skilled mechanical features known to the art of saw making. The hang of the blade has been carefully studied and adjusted, to suit the fancy of the most critical.

If this saw cannot be found in the Hardware Store and they will not order it for you, write to us. Price for 26 in. saw, $3.00 delivered. We make anything in Carpenters' Saws.

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The Phoenix Sliding Blind Co.

Enclosed find my check for blinds. I am pleased with them whole house.

and sorry I did not have them put throughout the Cc. W. MILLER.

PHENIX SLIDING BLIND Co.

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There Are Other Variety Machines

But Did You Ever See One Capable of Doing Such a Wide Range of Ornamental Work as This?

These samples were all made on our Universal Turning and Variety Machine. The Machine that has earned for itself the reputation of being the "most set and most profitable tool in the Shop." Would it interest you to know more about what this machine will do for you in your shop?

We will gladly send you large circular fully describing it.

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But hundreds of our customers have already ordered and reordered. It is a handmade cigar of the popular panatella shape, 4½ inches long. Its wrapper is of selected imported Sumatra, covering a clean, long filler body of rich, mellow tasty Havana. It draws freely and burns evenly with a firm, steel-gray ash, which denotes quality.

Our 4½c price is the logical result of our selling from factory to smoker direct. The Jobbers' Drummers' and Retailers' profits and expenses are all saved. Order our "PANOLA" and send us $2.25 within 10 days. Or if you like them, send us $5.00 for a trial of 100. We are so confident of their excellence that we will return the remainder expressage prepaid, along with our compliments and our estimate. Write for Free Catalogue C-26.

CHAS. MORRILL
283 Broadway
NEW YORK

REASONS WHY IT IS THE BEST

1. Plates cast solid with frame, for strength and rigidity.
2. Bed and back ribbed allowing clearance for sawdust.
4. Lever locks at any angle.
6. Duplicate length gauges.
7. Automatic stops for holding saw.

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H. C. MARSH CO.
606 Race Street,
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WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
Economical Use of Building Material

The present effort on the part of west coast lumber manufacturers to include a certain percentage of odd lengths in all shipments calling for standard lengths, has aroused a storm of protest from representatives of the retail lumber and material dealers.

These contend that the manufacturers are trying to shift the burden of loss of the odd foot from themselves to the retail trade; that odd lengths can not be used to advantage, and that the retail lumberman, if forced to accept odd lengths, would be forced to sell them for even lengths. In support of this contention they cite the general practice of placing studding and joists 16 inches from center to center so that 4-foot or multiples of 4-foot stock only will cut without waste. They argue also that joints must be made on studding or joists and that if odd lengths of siding, ceiling or flooring be used it would be necessary to place the joists a foot apart instead of 16 inches; this saving in the covering of the building would be more than offset by the additional quantity of material required to make the frame.

At the outset it must be understood by manufacturers and retailers that odd length material can not be made standard without the co-operation of the carpenter contractors through the retail dealers. The retail trade rightly contends that odd length lumber can not be used economically by the builder; also that if odd lengths be offered that the price should be lower, so that some inducement may be offered the dealer to handle them and, in turn, by the dealer to his customers to stimulate their use.

A number of manufacturers on the Pacific coast are making and shipping odd lengths of flooring, ceiling, siding and finish. The manufacturer holds that the greater portion of such material is cut into short pieces by the carpenter before becoming a part of the building. It is asserted further that odd length stock will cut to as good advantage as even length. Even a casual inspection of the exterior of frame buildings shows that fully as much siding is required between openings as below and above them. The spaces between windows and doors vary from 6 inches to possibly as much as 10 feet. The modern dwelling usually has a number of small projections, some of them not more than 2 feet and some as much as 6 or 8. At a venture is is probably safe to say that 55 per cent of the siding on a modern building is cut to lengths ranging from 6 inches to 6 feet. If the house be sheathed, then joints can be made at any point, and the only objection to the use of siding would come
from the carpenters, who could not cover so much space in a day, because of the necessity of making extra joints. However, it is not proposed to make all siding in short lengths. Take a building 28 feet long, two pieces of siding, one 13 and one 15-foot, will make a strip the entire length, or two 14-foot pieces or a 12 and 16-foot piece or a 11 and 17-foot piece. The carpenter surely would not object, providing, of course, something like suitable lengths were furnished.

Suitability of lengths of material for the building to be erected is a question which contractors and dealers should give very close attention. It is impossible to determine in advance exactly what sizes of material will be called for. Were it possible to do so the material dealers could put in proportionate supplies of the different grades and sizes and handle their business on a much more profitable basis with considerably smaller investment. The term “well assorted” does not apply to the stocks in a great many retail yards. Frequently the dealer is unable to supply the call for certain kinds of material and even long experience does not enable the dealer to foretell absolutely the requirements of his customers. It would require more preliminary work on the part of the dealer or builder to use odd lengths to advantage. It would be necessary to specify the approximate quantity of each length of different kinds of materials that could be used, and this would involve considerable close calculation. For example, instead of calling for 10,000 feet of siding, it might be necessary to specify one bundle each, 10, 11, 12, 13, 14, 15 and 16-foot stock, with a definite statement of the quantity of each short length that could be used without loss. To handle the business on this basis would mean real economy for lumber-yard men and a big advantage in competing for trade.

It would seem also that the judicious use of odd length stock by the building contractors would enable them to figure more closely on the quantity of material required in the construction of high-class buildings.

The Latest Wonder

The newest wonder is Brennan’s gyroscope railroad car, which runs on a single rail, can run on a tight rope, go up and down hill, turn corners swiftly and safely, all on the principle of the spinning top, which does not fall down so long as it goes on spinning. Two heavy gyroscopes rotating in vacuums in Brennan’s car keep the car upright, and will not let it fall over. The principle was tried out two years ago in a model in Berlin. Its working was publicly shown last week in England with a 22-ton car which carried forty persons, running on two wheels up and down a straight, single-rail track and round a circular track 220 yards long. Enormous speed—150 miles an hour—is predicted for railroad cars of this type, as well as great economy of power. It sounds fantastic and incredible, but the deeper one reads into its story the more serious and astonishing it appears. Louis Brennan, the inventor, has been at work for thirty years on the idea. He is the author of a successful torpedo, which bears his name.

Lend Us Your Plumb Line

BE FRIENDLY—write occasionally. The Editor would like to have a personal letter from every reader who has anything to suggest or criticize concerning the AMERICAN CARPENTER AND BUILDER. It looks good to us; how does it strike you? We want to build it strong and true, and so must test it continually with the plumb line of your honest opinions.

Does it help you in your work? Does it give you any new ideas? Does it ever make money for you? What part of the magazine do you read first? What department do you like best? Do the advertising pages list the materials and supplies you are in need of? By writing you will help to make your paper just what you want it.

The Bungalow

The Charlemagne McFaddens dwelt in an imposing pile
Of brick and mortar, fashioned in the early mission style.

And in the house were mission chairs by which they set great store,
Whose mission 'twas to keep them all from sitting on the floor.

They also owned some mission hens that furnished them with eggs,
And eke a little mission dog with quaintly Gothic legs.

So in their early mission house they dwelt contented—very,
Till Uncle John got jaundice and became a missionary.

Then in despair they tore their hair and turned to higher things,
And to their early mission house they added mission wings.

Alas for wings and higher things! Alas! Alackaday!
Equipped with wings, their mission house, it promptly flew away!

Now Ma McFadden might have wept, and said a lot of things;
But all she said was, “Charlemagne, you should have clipped its wings.”

And Charlemagne replied, “My dear, I bungled, as you know,
By building high, so next time I will build a bungalow.” —Cosmopolitan.
A "Really and Truly" Santa Claus!—He Brings the Best Present
Bridge Framing—Wood vs. Steel

SOME SURPRISING ACHIEVEMENTS IN HEAVY TIMBER FRAMING, OLD AND NEW—ADVANTAGES OF TIMBER OVER STEEL FOR CERTAIN KINDS OF BRIDGES

By T. B. Kidner

In these days of the all-conquering march of those mighty kings, steel and concrete, as materials of construction it cannot fail to be of interest to all engaged in that sort of work that there is at least one portion of this great continent of North America where the humble wood is still holding its own in a large measure as a constructive material.

The Canadian province of New Brunswick is entirely different in its physical conformation from the great prairie provinces of the northwest. Instead of vast plains stretching away for hundreds of miles, the face of the eastern province is broken up in every direction by hills and valleys, brooks and streams, lakes and rivers. As a consequence, bridges innumerable have to be provided on all the highways of the land and these are all in charge of the Provincial Government. The department of public works, with a staff of skilled engineers and designers, is kept busy with the construction and maintenance of bridges of all sizes and descriptions, varying from small bridges over creeks and streams up to huge spans of 300 feet and over.

In consequence of this demand, the matter of the best designs and materials for bridge work has been particularly studied by the government experts in charge of the public construction work of the province.

Formerly, of course, all the bridges were of wood, as in the rest of this continent, and many fine examples still remain to attest the skill and ingenuity of the bridge carpenters of a generation or so ago. Such a one as is shown in Fig. 1, where wooden trusses of 240 feet span, resting on cribwork piers, are depicted, calls forth the admiration of all true lovers of craftsmanship. For it must be remembered that the problem of designing and constructing a wooden bridge of such a span was a vastly different task from that which confronts the modern designer of steel structures of similar size. With his formulas at hand to guide him, the modern draughtsman can go ahead and design his bridge with perfect confidence that the steel works can meet his every requirement in plate and girder, bar and bolt, rivet and pin.

But it was otherwise with the men who planned the old wooden structures, such as that shown in the illustration, whose first thought before putting a pencil to paper was as to what sort of timber could be obtained and in what lengths and sizes. Then came the problem of designing the joints; a matter which gave play to great skill on the part of the old engineers. For the points of failure in wood construction are almost always at the joints, which must therefore be scientifically designed and properly divided with suitable fastenings of straps, bolts, etc.

The second illustration (Fig. 2) is a view taken at the other end of the long bridge (over half a mile in length) where the wooden trusses of our first picture were taken. As will be seen, a modern steel bridge is being erected on granite piers, the steel being supported during construction on a temporary platform carried on piles driven in the river bed. This picture shows the contrast between a modern granite pier and an old cribwork one.

But while steel holds the field for large bridges,
it is otherwise with those of small span. For some years after the introduction of mild steel in construction, the government engineers built all their new bridges of that material, but for several years past that policy has been abandoned and for all spans up to 180 feet wood has been resorted to once more.

A number of reasons have led to this re-adoption of wood, one of the most important being the great cost of maintenance of steel bridges. Every third year a steel bridge requires to be very thoroughly painted with a heavy coat of either the well-known carbonized coating paint, or a graphite compound.

The cost of painting a span of the size mentioned (180 feet) is from three hundred to four hundred dollars, and even then there are likely to be enclosed portions which cannot be reached and where oxidation may be doing its dangerous work in rusting and decaying some important fastening.

With the modern wooden bridge however, roofed in from end to end as shown in Fig. 3, not one penny need ever be spent on paint, with the one exception of a coat of hot tar which is given the joints as they are put together in the first place. There is little doubt also that the life of such a covered wooden
bridge will greatly exceed that of a steel one, a recent estimate by a leading designer of these structures placing the duration of the former as at least one hundred years. Of course, during that period the cedar shingles of the roof would require renewing several times; the life of cedar shingles being only about twenty-five years. The modern steel shingles will, however, undoubtedly last much longer than those of cedar, and may not require renewing more than once in a century.

Another important question is that of the up-keep of the floor of the bridge. The usual floor is composed of a planking of hemlock overlaid with a top floor of hardwood, usually birch or maple. In the case of the steel bridge, open to all weathers, it is invariably found that the hardwood upper flooring rots long before it wears out and thus requires frequent renewal. But with the covered wooden bridge, the reverse is the case, and the hardwood flooring will wear down to the thinnest possible piece before showing any signs of rotting.

On the question of the cost of maintenance then, the evidence is all in favor of the wooden as against the steel bridge. It is scarcely open to question, also, that as regards the life of the two materials, the palm must be awarded the wooden structure, for scarcely any engineer would care to claim a life of at least a hundred years for a modern steel openwork bridge, unless it was constantly cared for.

But there is another consideration of great weight and that is that in many cases the cost of transportation of steel to the site of the structure would be enormous. Many bridges are necessarily in remote portions of the country, away from railroads and water carriage, while the forests all about afford endless supplies of timber on the spot. If no saw mill exists within reach, a portable mill is easily obtainable, and, with the addition of a blacksmith's shop, will provide all the equipment necessary for carrying out the work.

Fig. 4 is a view of a modern wooden bridge, the trusses being of the Howe type. The material is native black spruce and southern (long leaf) pine; the flooring being of hemlock overlaid with birch as described above.

In conclusion, it may be pointed out that not only is it a matter of general interest that there is still a phase of construction in which wood is holding its own, but it is also important that young students should not wholly neglect the study of wooden structures. For not only in some parts of North America is the experience of the government engineers of New Brunswick likely to be repeated, but in many other parts of the world similar conditions prevail. In the countries still remaining to be opened up by those advance guards of civilization, the civil engineers, the wooden bridge may bear an even more important part in the future than it has in the past.

**His Business?**

Nurse (announcing the expected)—Professor; it's a little boy.

Professor (absent-minded)—Well, ask him what he wants.—*Boston Transcript.*
Space Apportioned for the Cement Show

Ever y inch of room in the Great Coliseum and also in the annex is taken at the drawing held October 29, and a great exhibition is promised.

The space drawing for the third annual cement show was held October 29, in the offices of the Cement Products Exhibition Company in the Commercial Bank building, Chicago. There were present representatives of most of the companies and firms that intend to exhibit. The demand for space was far in excess of that in advance of any show held heretofore and the fact presages an exposition of vast and important proportions.

There are still many unprovided with space and the effort will be made in some way to take care of them.

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Concrete Publishing Co., Detroit, Mich. 118
Concrete Stones and Sand Co., Youngstown, Ohio. 108-111
Cowan System of Portland Cement, Chicago. 111-112
Cropp Concrete Machinery Co., Chicago. 75-76
Crown Point Spur Co., New York, N. Y. 5
D. & S. Post Mold Co., Three Rivers, Mich. 45
Deen Steel Co., Chicago. 168
Deere & Co., Moline, Ill. 36-37


February 18-26, 1910, will undoubtedly mark the greatest congress of building material interests that has ever been held in the world. Each of the above conventions will draw a larger number of delegates than ordinarily on account of the many things of interest to be seen on this occasion. The show itself will be more representative than any held before.

National Fireproofing Co., Chicago. 66
Northwestern Expanded Metal Co., Chicago. 79
Ohio Contractors, Columbus, Ohio. 133-134
Oversea Roofing Co., Chicago. 73
Parker Holst & Derrick Co., Chicago. 84-85
Peck & Bruckner Brick Machine Co., Minneapolis, Minn. 97-98
Pepper & Co., John A., Chicago. 132
Sandusky Portland Cement Co., Sandusky, Ohio. 8
Sanford Concrete Machinery Co., Toledo, Ohio. 133-134
Sharon Steel Co., Chicago. 16
Simpson Cement Mill Co., Columbus, Ohio. 185-186
Skinner & Richards Manufacturing Co., Chicago. 148
Smallman & Trulon, Panora, Iowa. 179
Smith Co., T. L., Chicago. 58-59-60
Sonat Manufacturing Co., N. E., South Bend, Ind. 321
Somers Bros. Manufacturing Co., Urbana, Ill. 19
Standard Asphalt & Rubber Co., Chicago. 92
Standard Steel and Supply Co., Chicago. 139-140
Sterling Pattern Works, Sterling, Ill. 213
Sterling Wheelbarrow Co., Milwaukee, Wis. 99-100
Stockton Concrete Material Wash Co., Highland, Ill. 7
St. Paul Cement Co., St. Paul, Minn. 148
Stoutman Mill Co., Boston, Mass. 128-129
Svensman-Stanley Co., Chicago. 150-151
Taylor Iron & Steel Co., High Bridge, N. J. 94
Troy Wagon Works, Troy, Ohio. 71-72
Trowbridge Co., Oceana, Mich. 2-10
United States Gypsum Co., Chicago. 87
Utah, U. S. Gypsum Co., Millinocket, Me. 224
Vesuvius, F. F., Boise, Idaho. 192
Wabash Portland Cement Co., Detroit, Mich. 120
Wales Gypsum Co., New York, N. Y. 33
Williams Patent Crusher and Pulverizer Co., Chicago. 127
Wolfe Engineering Co., Chicago. 191
Zierer Bros., Berwick, Pa. 143
Proud of "Carpenters' Building"

UNITED BROTHERHOOD OF CARPENTERS AND JOINERS OF AMERICA OCCUPY THEIR NEW INTERNATIONAL HEADQUARTERS AT INDIANAPOLIS

By Frank Duffy

On July 22, 1909, there was dedicated in the city of Indianapolis a building which is and should be of national interest to all carpenters and woodworkers. Since it is one of the well known traits of the trade to encourage any project and rejoice at any achievement aimed to benefit the craft or to better the lot of its workmen, I think I may very safely say that all carpenters and woodworkers wherever and however located, are as one concerning this new International Headquarters of the United Brotherhood recently dedicated at Indianapolis.

We are all proud of it!

Without going at length into detail regarding this dignified and attractive structure of brick and stone—the photographic views show it better than any words can describe anyway—I want to first recall to you some very interesting history connected with the earlier days of our craft and surrounding our earlier business home, the historic "Carpenters' Hall" of Philadelphia.

Looking back one sees an ancient organization which history knows as the "Carpenters of Dublin," to which Henry VII in 1458 granted a charter, "to exist as the Carpenters' Mechanical Guild with right to elect for a term of three years representatives to the common council of the city of Dublin, Ireland."

And then one sees a quaint old building in Philadelphia, situated on Chestnut street, between Third and Fourth streets, known as "Carpenters' Hall." It was built in 1770, by the Carpenters' Company, a company patterned after "The Worshipful Company of Carpenters of London, England," founded in 1477. It is of record that in this hall all the historic Colonial Congresses of America met prior to the Declaration of Independence. In it rang the eloquence of Patrick Henry, George Hancock, Randolph, the Lees, Adamses and other patriots of Colonial times. Washington, Franklin and other conferees of the first Colonial Congress "gathered in it to counsel and advise." And this same "Carpenters' Hall" was, in 1787, made more famous by the fathers of the young republic when they selected it as the place of convention at which they formed and agreed upon a "Constitution for the United States of America."

Yes, in the storehouse of the Brotherhoods' memory are tender recollections of its former habitation, in the good old Quaker City of the Keystone state.

But it was written—
"Westward the course of Empire takes its way."

And following the prediction of the poet the United Brotherhood, in the fall of 1902, sought and found in the "Capital City" of the Hoosier state an abiding place wherein to remember old friends while making new ones, friends vying in staunchness with the old, to shape the future and to build for itself a home wholly its own, comfortable, commodious and ample for its needs.

Surely the present Brotherhood of Carpenters and Joiners may proudly trace their descent from such an historic past. May they take care to just as proudly
see to it that this new International Headquarters at Indianapolis, the “Carpenters’ Building,” shall become associated with public spirited and heroic acts as was that other!

When the United Brotherhood was founded in its present form in Chicago, August 12, 1881, it had only twelve local unions and two thousand and forty-two members. Now it counts nearly two thousand local unions and over two hundred thousand members, embracing the Journeyman Carpenter and Joiner, Stairbuilder, Shipjoiner, Millwright, Planing Mill Bench Hand, Cabinetmaker, Carbuilder and those engaged in running woodworking machinery, all of good moral character and competent to command standard wages. This new International building, erected at a cost of one hundred thousand dollars is a testimony to the faith of these men in their organization—a faith sufficient to make them willing to invest that amount in a permanent business home.

The building stands on the north side of East Michigan street, between Delaware and Alabama streets, and most conveniently reached by transfer or direct car service running over Massachusetts avenue. On the left of the building is seen through the foliage the dark outlines of an elegant apartment house; and on the north a clean, narrow street—Hudson—which is used by the delivery wagons as leading to the alley in the rear of the building, where all shipments are received and sent. The side view shows with striking prominence the east side and south front of the structure and the full title of the organization.

As one stands before the main entrance the eye instinctively and irresistibly rises to the motto just above the keystone—Labor omnia vincit—(Labor conquers all; or Labor reigns omnipotent).

We cannot see how it is possible for any person, especially a member or a guest of the Brotherhood, to long remain outside, however; rather let us enter. In the first room will be found President William D. Huber, the warm grasp of whose hand is so well known. The next room is that of General Treasurer Neale. Directly opposite is the council room of the General Executive Board; and next to it is the room occupied by your General Secretary. “This is my busy day,” he will say, though it is extremely doubtful if there will ever be a day when he will be so busy that he cannot shake hands with members, friends and visitors, busy or not.

A view of the corridor and main stairway is given in one of the photos shown. The stairway to the left leads to the basement, the vast storeroom of the building; the facing stairway leads to the upper floors. At the north end of this corridor is the large, ample department room, the room of the clerical force, every member of which will cheerfully point out the admirable, thorough system that aids them in their work.

On July 22, this new business home was dedicated to such “measures as will tend to perpetuate our organization, spread its principles, elevate our trade and advance our individual and collective interests to the end that the world may not look upon us as men devoid of principle, destitute of honor, worthy only of the scorn and contempt of our fellowmen.”

At these dedication exercises the state of Indiana was represented by her Governor and the city by
Among the multitude were many whose pens have been brave in presenting and defending the rights of the working masses and the freedom of the press and of speech. And lastly there were present the workmen, men who have passed out of their apprenticeship, learned craftsmanship and become efficient journeymen.

On that day thousands of the citizens of Indianapolis realized what the founders and builders of this organization determined should be its aim and purpose, viz.: that the laborer and his labor should be among those things which advance the civilization of the world. And in establishing this new International Headquarters they built upon the wise principle, that what is worth doing at all should be done well.

In conclusion I want to say to all carpenters, with their allied craftsmen, “Dear brothers, let us look for new joys, higher and nobler aspirations; and take courage from what has already been done and what has already been won.”

Fraternally Yours,

Frank Duffy
GENERAL SECRETARY

New International Headquarters of the United Brotherhood of Carpenters and Joiners of America. Indianapolis, Ind.
Melted wood will become an article of commerce, in the opinion of scientists, because of the new qualities which the melting process gives it. It has a very fine grain, is hard and resistant and takes a high polish.

Francis Marre, writing in *La Nature*, a Parisian publication, tells how wood is melted. A metal boiler with a double bottom is used. It is equipped with a tube and stop-cock for drawing off liquids and with apparatus for exhausting the air. The boiler is filled with small bits of wood. It is then closed with a lid, a vacuum is produced and the wood is heated to a temperature of 284 degrees Fahrenheit.

The water and other substances cooked from the wood are first drawn off through the tube and stop-cock and the heating is then continued for three hours. The result is the separation of the ingenuous ingredients which are drawn off and condensed for use.

The substance now remaining in the boiler is the fibrous skeleton of the wood and the mineral salts. This mass is allowed to cool slowly without contact with the air. It is then placed in another boiler with hydrogen under a pressure of from 1.5 to 2 atmospheres and heated to 1,500 degrees Fahrenheit for two hours. This completes the melting process and the melted wood comes from the second boiler a hard, homogeneous mass.

The first experiments in melting wood were made in 1891. They were successful but the results were considered as laboratory curiosities. Later experiments, however, convinced scientists that melting wood was a process that might become of commercial value and the method described was worked out.
How to Use the Steel Square

SHOWING HOW TO FRAME IRREGULAR SHAPED ROOFS BY MEANS OF THE STEEL SQUARE—HOW TO DO THE SAME BY A SIMPLE DIAGRAM METHOD

It sometimes occurs that the carpenter is called on to frame roofs for very odd shaped buildings, which may be caused from irregular street, where the building site is limited, or where space is desired rather than architectural effect.

To run the hip lines to a common center, it will be seen, would cause as many different pitches in the roof, as there are to be sides to the building, and of the angle. Then all of the slopes will be of the same incline, or pitch, besides making the work regular and greatly simplifying it. To do this, it is necessary to have a deck for the hips to rest against. This deck should be level and its plates should be parallel with the plates of the different sides of the building, as shown in Fig. 266. The deck in this case is located by the juncture of the hips from the shortest side of the building. There is one square corner in the plan and it is our purpose in this article to show that the rule for framing the rafters for this corner applies to the other corners alike.
The common and jack rafters on all sides should rest at right angles or square with the plate, otherwise their backs will not lie in plane with each other.

At corner No. 1 the framing lines are shown for a square corner, such as used for any square corner for a hip roofed building. A B represents the run of common rafter, B C the rise and A C the length. This answers for the common rafter on all sides, as they are of the same pitch. B D represents the run of the hip, B C' its rise and D C' its length. a b represents the run of the jack, b c its rise and a c its length.

Now for the proportions to use on the steel square to obtain the cuts; they are as follows:

To begin with, it is understood of course that the run and rise will give the seat and plumb cuts, so we will pass that part by for the present. It is the side cuts that bother most carpenters. The jack being but a piece of a common rafter, its side cut may be found by its proportions as follows:

Take A D on one arm of the square and A C on the other—cut on A C; or the same results may be found by taking the same proportions of the jack measurements as follows:

Take a D and a C (the length of the jack) and cut on a c. For the side cut of the hip, take B E, which is in all cases at right angles to B D and in the case of the square corner is of the same length as the hip's run (B D) as will be seen in the illustration. Then the proportion to take on the steel square is B E (tangent) and D C' (length of hip) and the cut will be on the latter. As the hip must rest against the corner of the deck, it is necessary that the above so-called "side" cut be made right and left; the cut being made only to the center of the back of the hip.

Now we will take up the framing of the rafters for corner No. 2, but there is nothing more to say than has been said in the case of the square corner at No. 1. Like letters represent like parts, but of course the proportions are different. Note the difference in the length of B D and B E. In No. 1 they are equal, but see the difference in No. 2. For that reason, the hip's run and its length taken on the steel square will not give the side cut for anything but for the square corner. The reason of this is because the angle of the plates forms an angle of 90 degrees and the run of the hip when the pitches are equal must necessarily rest at 45 degrees, which is at the equalizing point of the tangents to the radius.

In this plan are shown six different corners, and while the treatment, as we have said before, is the same, it requires a diagram to first arrive at the proportions to take on the steel square, except in the regular polygonal corners, which may be memorized to work with the full scale to the foot run. However, as their use other than for the square corner is so limited it is not worth while to try to carry the figures by memory alone. The tendency among carpenters is rather to get away from figures and complicated diagrams, the least lines shown suits them the best.

In the foregoing, and in fact most all of our work, the purpose has been to get back at the beginning; to show not only why certain figures on the steel square give correct results, but what determines the parts to use. There are, of course, more simple ways in finding or arriving at some of the cuts than by the use of the square. For instance, the side cuts for the rafters shown at the corner No. 2 can be obtained in the simple drawing as shown at Fig. 267.

This is a plan of the corner of the deck plate showing the hip resting against same and with a jack resting against the hip. The drawing should be made the full size, or thickness of the timbers to be used in its construction. Now if there was no pitch to the roof, the cuts would be just as shown in the diagram. A to A are the distance apart that the plumb lines should be on the sides of the hips and the cut should be made into the center line, as shown, to fit against the corner of the deck. If the hip is to fit against a ridge board, then from C to C would be the distance apart the plumb lines should be. B to B represents the distance apart the plumb lines should be for the jack. This is simple enough; but as simple as it is, it is not generally understood that these measurements remain the same distance apart regardless of the pitch given the roof. All that is necessary, is to measure square back from the plumb cut for the desired pitch the distances above mentioned, carry these lines around the timber and by cutting diagonally across the back, the rafters will fit to their respective places. By this method of framing, the angles for the square corner are all on an angle of 45 degrees and the measurements at AA would be one-half the thickness of the hip and that at CC and BB would be the full thickness of the hip and jack respectively. This
is on the same principle of taking a block cut from the rafter and placing it parallel with the plumb cut, scribe off its thickness, carry the lines around the rafter and cut diagonally across.

There is another thing that is contained in Fig. 267 that we wish to call attention to and that is the backing of the hip, which may be obtained by setting off the distance AA along the seat cut; and by removing the wood to the center of the back, it will have the proper bevel to receive the roof boards. Remember the distance from AA remains the same for any pitch given the roof for this shaped corner. It is the angle of the seat cut that regulates the gauge line on the side of the rafter.

**Valuable Data for Builders**

**First of a Series of Articles—Loads to Which a Structure Is Subject—Dead, Live, Snow and Wind Loads—Principles of Tension and Compression**

*By Paul T. Lesher*

One of the first and most important things to take into consideration in the study of building construction is the different kinds of loads a structure is liable to have. These may be divided into three classes: dead loads, live loads and the snow and wind loads.

**Dead Loads on Structures**

The weight of the structure itself is the dead load; for instance the weight of the roof forms a portion of the dead load on the walls and columns; the floors cause a dead load to come on the walls and columns; and then the total dead load of the structure is transferred through the walls and column footings to the supporting soil.

In order to figure this dead load we must know the average weight of the materials and the following table gives the weights of the most common building materials.

**Weights of Building Materials**

<table>
<thead>
<tr>
<th>Material</th>
<th>Weight per cu. ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>White pine</td>
<td>21/2 lbs.</td>
</tr>
<tr>
<td>Hemlock</td>
<td>25/3 lbs.</td>
</tr>
<tr>
<td>Spruce</td>
<td>25/6 lbs.</td>
</tr>
<tr>
<td>Yellow pine</td>
<td>4 lbs.</td>
</tr>
<tr>
<td>Oak</td>
<td>4 lbs.</td>
</tr>
<tr>
<td>Structural steel</td>
<td>0.20 lbs.</td>
</tr>
<tr>
<td>Cast iron</td>
<td>0.26 lbs.</td>
</tr>
<tr>
<td>Wrought iron</td>
<td>0.28 lbs.</td>
</tr>
<tr>
<td>Ordinary soil</td>
<td>100 lbs.</td>
</tr>
<tr>
<td>Brickwork in lime mortar</td>
<td>120 lbs.</td>
</tr>
<tr>
<td>Brickwork in cement mortar</td>
<td>130 lbs.</td>
</tr>
<tr>
<td>Stone concrete</td>
<td>130 to 140 lbs.</td>
</tr>
<tr>
<td>Granite</td>
<td>170 lbs.</td>
</tr>
<tr>
<td>Marble or limestone</td>
<td>160 lbs.</td>
</tr>
<tr>
<td>Sandstone</td>
<td>140 lbs.</td>
</tr>
</tbody>
</table>
| Ordinary lath and plaster | 6 lbs. per sq. ft.

To calculate the dead load of a proposed building it is necessary first to fix upon the general arrangement, disposition and approximate dimensions of all the parts and to estimate approximately their weights. After the calculations are made and the construction detailed, the actual dead loads should be checked to make sure that they agree closely with the assumed load. If considerable variation is found, it can be taken care of by increasing or diminishing the size already determined proportionally, as may seem necessary.

The weights of the various systems of fire-proof floors may vary from 60 pounds to 125 pounds per square foot of floor, including the necessary steel and other items used in their construction, and the weight should be justified before finished calculations are made. Generally an assumed load of 80 pounds per square foot of floor will be sufficient for the dead load. In buildings with movable partitions an allowance should be made for their weight in the dead load, if a small dead load is taken.

**Live Loads**

The live or accidental load for floors is a quantity for which there is no standard, as it consists of the weight of people, machinery, furniture, etc. The requirements of the building laws of Philadelphia, which are a very conservative standard to adopt, are as follows:

- "Dwellings, tenant houses, apartment houses, hotels, hospitals and asylums, use a live load of 70 pounds per square foot.
- "For office buildings use 100 pounds per square foot.
- "For places of public assembly, light manufacturing buildings and retail stores, use 120 pounds per square foot.
- "For store houses, warehouses and heavy manufacturing buildings, use 150 pounds per square foot and upwards in proportion to the loads they may have to carry."

The following data is fairly conservative and may be properly used where there are no building laws to the contrary:

The load of 70 pounds per square foot for dwellings will probably never be realized, but inasmuch as a city dwelling house is liable to be taken and used for some other purpose at any time, it is not advisable to use a lighter load. In the case of a country or seaside house or hotel, or a building of like character, where economy demands it and where the actual use of the building for a long time is certain, a live load of 40 pounds per square foot of floor is ample for practical purposes, for rooms not used for public assembly. For rooms of public assembly a live load of 80 pounds per square foot is sufficient. If the desks or chairs in a room of this character are fixed, as in
a school room, church, etc., a load of more than 40 to 50 pounds per square foot of floor will never be realized, but it is not general practice to consider this, although there are sometimes special cases where economy demands it. Office building floors have been designed for live loads ranging from 20 pounds to 150 pounds per square foot of floor. Retail stores should have floors proportioned for live loads of 100 pounds per square foot and upwards. The floors of wholesale stores, warehouses, machine shops and the like should be designed for live loads of 150 pounds per square foot and upwards. The static loads in textile factories will seldom exceed 40 pounds per square foot. In most cases a live load of 100 pounds per square foot, including the effect of moving machinery should be ample. In general, a conservative rule would be not to assume loads less than the above, but in all cases to be sure that in the actual use of the building, so far as can be foreseen, the loads do not exceed the above.

Furthermore be sure that the loads used, together with the sections used, do not give excessive deflection or vibration. In a building, stiffness or freedom from vibration is a factor almost as important as mere strength. It is also well to bear in mind that the deflection due to the dead load is permanent and that the only variable deflection is that due to the live load, and that this variable deflection is the cause of plaster cracks and the like.

The practice in the case of plastered work where a considerable deflection is harmful, is to proportion the beams or girders so that their total deflection will not exceed 1/30 of an inch per foot of span. If the span is not more than 20 times the depth of the beam, the deflection will be within the above limit.

**Wind Loads**

The wind load on a roof depends upon the pitch or slope of the roof and is usually assumed to be 40 pounds per square foot, horizontal wind pressure; that is, the wind is considered as blowing at this pressure in a horizontal direction; but the resulting pressure upon the roof is always taken normal (at right angles) to the slope.

The wind pressure against a vertical plane depends on the velocity of the wind, and, as ascertained by the U. S. Signal Service at Mt. Washington, N. H., is as follows:

<table>
<thead>
<tr>
<th>Velocity (Miles per hour)</th>
<th>Pressure (Lbs. per sq. ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>0.4</td>
</tr>
<tr>
<td>20</td>
<td>1.6</td>
</tr>
<tr>
<td>30</td>
<td>3.6</td>
</tr>
<tr>
<td>40</td>
<td>0.4</td>
</tr>
<tr>
<td>50</td>
<td>0.9</td>
</tr>
<tr>
<td>60</td>
<td>1.4</td>
</tr>
<tr>
<td>80</td>
<td>2.6</td>
</tr>
</tbody>
</table>

The wind pressure on a cylindrical surface is one-half that upon a flat surface of the same height and width.

On the assumption of 40 pounds per square foot horizontal wind pressure, use the following for the various slopes, pressure at right angles or normal to the slope of the roof.

**Wind Pressure for Various Slopes**

<table>
<thead>
<tr>
<th>Rise (inches per foot)</th>
<th>Pressure (Lbs. per square foot)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>17 pounds per square foot</td>
</tr>
<tr>
<td>6</td>
<td>29 pounds per square foot</td>
</tr>
<tr>
<td>8</td>
<td>33 pounds per square foot</td>
</tr>
<tr>
<td>10</td>
<td>36 pounds per square foot</td>
</tr>
<tr>
<td>12</td>
<td>40 pounds per square foot</td>
</tr>
</tbody>
</table>

In regard to the wind pressure against the sides of a building, use not less than 25 pounds per square foot for the tenth story, 2½ pounds per square foot less on each preceding lower story and 2½ pounds per square foot more for each succeeding upper story to a maximum of 35 pounds at the 14th story and above.

**Snow Loads**

The snow load on a roof is generally taken at about 12 pounds per square foot of roof (horizontal area covered) when the slope of the roof is under 12 inches rise per foot of horizontal run, but when the slope is over 12 inches rise per foot, a load of 8 pounds per square foot is considered ample. By “horizontal area covered” we mean the span of the truss multiplied by the distance apart of the trusses.

**Tension and Compression**

When the forces which act upon a body are exerted in directions away from each other, tending to elongate or stretch the body, this character of the stress is called tensile stress or tension. It is also evident that the forces in the body which resist tension must act inwards or towards each other, as indicated by the arrow-heads upon the line denoting tension in Fig. 1a.

When the direction of the forces which act upon a body act toward each other, their combined action tends to shorten or compress the body; this character of stress is called a compressive stress, or compression. It is evident that the forces of the body which resist compression must act outwards or away from each other, as indicated by the arrow-heads upon the line which denotes compression in Fig. 1b.

The ultimate strength of any material is that unit stress which is just sufficient to break it.

**Ultimate Tensile Strength of Materials**

| White Pine | 6,000 pounds per square inch of cross section |
| Spruce     | 6,000 pounds per square inch of cross section |
| Yellow Pine| 8,000 pounds per square inch of cross section |
| Oak        | 10,000 pounds per square inch of cross section |
| Wrought Iron| 52,000 pounds per square inch of cross section |
| Rolled structural steel | 64,000 pounds per square inch of cross section |
| Cast Iron  | 18,000 pounds per square inch of cross section |
For timber, steel and wrought iron, use a factor of safety of four and for cast iron a factor of safety of six. Thus to get the safe working value for a certain material, we divide the ultimate value by the factor of safety.

The following cement values are the least that should be allowed for a first class cement of Portland grade:

- Neat Portland cement, 1 day in air, 6 days in water, 450 pounds per square inch of cross section. Portland cement and sand in a proportion of 1 to 3, 1 day in air, 6 days in water, 160 pounds per square inch of cross section. Between the first class Portland cement and ordinary lime mortar, there are a number of grades. Their adaptability will depend upon the special requirements of each case. In general, the cements may be divided into three classes: Portland, or artificially made cement; Rosendale, or natural cement, and Union which is a mixture of Portland and natural cements.

**Ingenious Door Arrangement for Small Garage**

A small garage that is only large enough to house an automobile must have a door almost as large as one end of the building. Frequently it is desired to hang such a door on rollers, but the width of the small garage would not allow for a track of sufficient length to hang an 8-foot door in the usual manner. Instead of having one large door, two 4-foot doors can be made and hinged together as shown in the sketch. One of these doors is fitted with rollers which run on a short track. The hinged door is opened and folded over the first door and then both of them rolled back over a 4-foot space.

**Misuse of Bathtubs in Tenements**

In many cities serious efforts have been made to improve living conditions in tenement houses, especially as concerns sanitation and cleanliness, but, according to Popular Mechanics, results are often so disheartening as to make model tenement owners wonder "what's the use."

These illustrations show some of the means in which bathtubs in many tenement houses are misused and abused. Many optimists insist that it results from the fact that the tenants do not know what a bathtub is for and that they will soon learn to appreciate its presence, but the reason for the misuse in many cases is due to the fact that the setting aside of valuable space which would only be used perhaps once a month for the purpose it was provided for is considered wasteful. Consequently, some bathtubs are used as receptacles for coal and other fuels, as a convenient place into which to throw rubbish, and sometimes, when the bathroom window is in a position to admit the sun, is filled with dirt and attempts are made to grow small vegetables or flowers.

**Waiting at the Church**

A young man lived at some distance from his bride-elect. On the eventful day he set off for the station in good time, but, being delayed by friends, he missed his train. Then he bethought himself of the telegraph. "Don't marry till I come—William!" was the message he wired.

**What Every Journalist Knows**

Nice Old Lady: "Will you kindly tell me if the lady who writes 'The Mother Page' every week in your paper is in? I want to tell her how much I have enjoyed reading her articles on 'The Evening Hour in the Nursery.'"

Office Boy: "That's him over there with the pink shirt, smokin' a pipe."

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Hot Water Supply for Kitchen and Bath

WITH all the rapid progress of the present age, many of us, although more or less enthusiastic in our efforts, seem very apt to overlook some very important features; I refer particularly to contractors and builders and building operators at this time, and my object of discussion will pertain to water heating appliances only.

Having had wide experience as a builder, also as a real estate operator—buying, selling, renting, etc.—the writer has found that the tenant, or prospective buyer of today, is particularly interested in the hot water supply. In fact, that is about the first and principle thing he wants to know about when he is buying or renting a dwelling place. It may be added also that the failure of a good and sufficient hot water supply in the home, or flat, as it may be, causes the landlord more trouble than any other one feature connected therewith.

Fortunately, in the last few years, there have been devices and arrangements perfected which have proven conclusively that shortage or uncertainty in the hot water supply need no longer exist; and the operator of today, in order to make a success of his undertakings, should familiarize himself with all devices of such description.

In regard to city apartment houses different people have different views. In my experience, I find that where the owner or landlord is desirous of furnishing hot water to all his tenants he very often has a great deal of difficulty, for the following reasons: You will find that in most flat buildings where there are a number of tenants, there will be some who are more or less reckless and void of good judgment. These tenants will use, or rather waste, quantities of hot water. This causes the balance of the tenants to run short on their supply when actually in need of same. This condition causes a general dissatisfaction.

I have found that the most practical way of operating a flat building—just as with a detached home—is to equip each apartment with a high-grade water heater and let each tenant furnish and regulate his own supply of hot water. This can be done by specifying or installing the proper device, in each kitchen if a flat, and if a self-contained residence, in the basement.

Now, there are hundreds of devices constructed for the purpose of heating water; there are however, but few of this quantity that are truly serviceable and that will please the tenant. Here is where the building operator should be discreet and cautious in making his selection, and should see that a device is installed that will insure the tenant the greatest efficiency and the least trouble to operate. As a matter of fact, most any device will operate when brand new, just as any new piano will sound well as long as it is new, but after having been in constant operation for six months or a year, it begins to display its cheapness and defects in general; so it is with a water heater.

I have, on a number of occasions, met various builders and operators, and have put the question to them, as to their hot water supply, and they often reply: "Oh, we don't care what becomes of the tenant or householder, we are putting up this building for a speculation; what we want is to make money out of this." To which I have replied: "If you are a good speculator, you cannot make a better investment or show prospective tenants or buyers a more enticing feature than to assure them of a good and sufficient hot water supply, in that particular dwelling. For after you have spent $15.00 or $20.00 along this particular line, it is an easy matter to draw down three times the amount of this particular feature, when making the sale.

"When people leave your office and say they will call again and do not return or make a purchase, you pay no attention to it. Consequently you allow yourself to get into a rut. In many cases, if you will follow up your prospect, you will find that he will come back and tell you some truths and facts, as to why he did not purchase. I think you will agree that it is well in many cases—although oftimes painful—to stare facts in the face, to have people tell us the truth. This, in my opinion, is the only way we can determine and really learn the 'whys' and 'wherefores!'"

Building, operating and renting today is like any other commercial line or merchandising. The prospective tenant or purchaser is looking for the best he can get for the money. It is up to the contracting builders to see that he gets it. A thoroughly satisfactory hot water supply you will find—such at any rate has been my experience—is a greater drawing feature than is a hardwood floor or a tile fireplace. While these features look well, after all they do not give the occupant what he most needs and must necessarily have, namely, hot water.

Wigg—What kind of cigars does Closefist smoke?
Wagg—Well, when you light one of them you instinctively look around for the corned beef.

Told in Denmark

Returned Explorer—Yes, the cold was so intense at the pole we had to be very careful not to pet our dogs.
Miss Youngthing—Indeed! Why was that?
Returned Explorer—You see, their tails were frozen stiff, and if they wagged them they would break off.
Heat—When and Where You Want It

How Your Steam or Hot Water Heating System May Be Arranged to Give Heat at the Radiator When the Furnace Fire Is Low or Out

In spite of the delight and satisfaction of having his residence equipped with a modern heating plant, almost every home owner has had his times of forlorn despondency over the very size and completeness of his heating system. In the first snappy days of fall, before the furnace fire has been started, he is apt to wonder peevishly,—what's the good of a steam plant without any steam; or a hot-water system that isn't going; or a furnace without any fire in it! And in the spring, again, his feelings are the same when Old Winter comes romping back for a little nace, steam or water-heating plant can not deliver heat just when and where you want it—except uniformly and in large quantities. Some extra provision has to be made for heating portions of the house locally if it is to be perfectly comfortable at all times.

Some local system of heating of this nature, if it could be successfully arranged, would also be greatly appreciated at times in mid-winter weather. Who, getting up of a cold winter's morning, has not wished with chattering teeth for some source of warmth closer than the basement!

![A San Francisco Apartment Heated with a Gas Heated Steam Radiator Used Independently](image)

Visit after the fires are all banked for the summer and the screens put up!

He knows that his big furnace, if brought into action, would be too much of a good thing entirely—would shortly have them all out in the street with the windows open (not to mention the expense of starting her up)!

And yet some heat is needed; for certain portions of the house are decidedly cold and clammy.

This condition has for years presented a real problem to house fathers and has been the cause of much concern because of the ever-present danger of colds. The truth of the matter is that the ordinary large fur-

It is the purpose of this article to describe very briefly a system, recently perfected, which, used either independently or as part of an ordinary steam or water system, seems to be just exactly what is needed along this line. A steam or water radiator is equipped underneath with a gas burning heater. A match is all the kindling required; the volume of water stores up and retains the heat; and an automatic device, or "janitor" turns down the flame when the required degree of heat has been reached.

Fig. 1 shows a typical installation using one of these gas-heated radiators as part of a regular steam-heating system. For this steam radiator, B, an automatic
regulator controls the supply of gas, reducing it as soon as a few pounds steam pressure is raised. The pressure of steam on the diaphragm reduces the flow of gas to the radiator, hence its great economy in the use of fuel. A gauge indicates the amount of water in the water chamber. When it is desired to use gas for fuel turn off radiator valve tightly; fill radiator with water until gauge shows one-half full, then apply match to the burner and in a short time you are enjoying steam heat without coal. The radiator is equipped with an automatic air valve, which closes as soon as the radiator is filled with steam.

This steam radiator is assembled in sections from four to fifteen, the size of the radiator depending upon the size of the room to be heated, and is manufactured in the following heights:

- 2-column, 37 inches high by 8 inches wide.
- 6-column, 20 inches high by 12¾ inches wide, without flue.
- 6-column, 20 inches high by 12¾ inches wide, with flue for natural gas.

With artificial gas any gas-heated radiator is odorless, and does not require a flue. In some sections of the country the natural gas is of such a quality that no flue is required, but in other sections a flue is required. The 6-column radiator, on account of its height, can be used under a window or set in a mantel in place of a gas log or grate.

The following are the rules for figuring this kind of radiation:

- Allow 1 sq. ft. of radiation for 2 sq. ft. of glass.
- Allow 1 sq. ft. of radiation for 20 sq. ft. of exposed wall.
- Allow 1 sq. ft. of radiation for 200 cu. ft. contents.

The sum of these amounts would represent the number of feet of heating surface it would require for steam. This is based on inside temperature of 70 degrees.

Connection to the furnace boiler system is made by removing the plug from right hand side of radiator and connecting the radiator with pipe line to boiler. Thus when part of the radiators in a steam system are of the gas heated type they can be used the same as other radiators during cold weather. In moderate weather, such as fall and spring, the gas attachment can be used to kill the chill, for it does not pay to keep up a fire in the boiler for a little heat night and morning.

Fig. 2 shows a system consisting of two water radiators, gas heated, entirely independent of boiler or expansion tank. This water radiator resembles the steam radiator in outward appearance. It does not require a water gauge as it is connected to the water supply system of the building. A key air valve is used instead of an automatic valve, because a hot-water system does not become air bound like a steam system. A thermostat regulated by the temperature of the water controls the gas supply, reducing it as soon as the water reaches a temperature of 190 degrees.

This gas-heated water radiator can be installed in three different ways; independent of boiler or expansion tank—gas only for fuel, Fig. 2; independent of boiler but connected to an expansion tank—gas only for fuel; and as part of a hot-water heating system with boiler in basement—gas or coal for fuel.

In figuring hot water radiation the rule previously given should be followed, adding 50 per cent to the number of feet of heating surface required for steam.

Both the gas-heated steam and water radiators, although decidedly new, have been already tested and used successfully for the heating of individual rooms and for whole houses in the mild climates, such as California and the south; these in addition to the uses first mentioned. Wherever equipped with them you can have steam or hot water heat in twenty minutes; and at very low expense—a little over one cent an hour, for example, for a seven-section radiator. And you turn off even this small expense the moment you turn off the heat.
A Solution of the Water Problem

HOW TO SUPPLY THE COUNTRY OR VILLAGE HOME WITH FRESH RUNNING WATER FOR ALL USES
WITHOUT RESORT TO WATER STORAGE

By Herbert J. Day

Strange, isn't it, that in a world full of electrical wonders, a world full of marvelous attainments in intricate machinery, in a world that contains such beautifully designed and wonderfully appointed homes—strange, isn't it, that people have advanced no further in the problem of supplying those homes with water than to store it away for future use, just as did their most remote ancestors?

Yet that is exactly what they are doing, to a great extent today.

The receptacle has been improved, to be sure; a copious tank takes the place of the primitive water urn—or whatever it was that held the reserve supply—and the water is conducted through pipes to obviate the necessity of going after it.

By elevating this tank, gravity takes a hand in delivering the water, supplying the home with a pressure proportionate to the height of the tank above the faucets.

Another method—a later development—is to use an air-tight tank, burying it in the ground, or placing it in the cellar of the house. In this case water is forced into the tank compressing the volume of air to a degree sufficient to drive the water up to the fixtures.

This method has the decided advantage of being frost proof, and it is a great improvement over the outdoor elevated tank that is exposed to extremes of climatic conditions.

But, notwithstanding the fact that the service is very satisfactory, it would seem that the ideal method would be one that entirely obviated the storage of water. Imagine the farmer's wife who has been used to carrying the water from the well by the bucketful—or pleading with John to do it—or the more fortunate and much envied one who has a pump in her kitchen—picture their going to the kitchen sink or a neat lavatory and drawing water direct from the well.

Here would be the realization of her fondest dreams. How often has she envied her city cousin, who simply turns a faucet and gets water in almost wasteful abundance. Of course, the city water is "not like she gets from the well on the farm." It never is, and that is the one saving grace that reconciles her—almost. Perfection would be a combination of city service and country water—water that is ever ready at the turn of the faucet, and always as fresh as if just sipped from the old oaken bucket.

It was not until quite recently that the problem of fresh water was satisfactorily solved. It remained for Mr. Thomas O. Perry, a Chicago inventor of note, to bring forth a pneumatic pump that would operate directly at the source of supply and maintain a pressure of water at the faucets without recourse to the storage reservoir.

This pump is operated by compressed air in a manner somewhat similar to pneumatic riveting machines, pneumatic railroad switches and like devices, except that instead of employing a piston as do these, the air acts directly upon the water in the cylinders, without the use of a plunger of any kind. The pump consists of two cylinders, with a mechanism to alternately shift the air through a rotating valve, from one to the other. The pump is submerged in the water to a depth sufficient to give the proper "head" for the cylinders to fill by gravity—usually 3 to 6 feet. While one cylinder is being discharged by the compressed air, the other, from which the rotating valve cuts off the air, is filling. When the first cylinder is nearly emptied the valve is automatically reversed, cutting off the air and opening an exhaust, allowing it to refill, at the same time turning the full force of air on the other cylinder. The water is driven directly into the water main.

In effect, there is simply an air pipe from the air
compressing outfit, leading to the well and forcing the water through the mains to the faucets—the pump acting as a valve to allow water to enter the pipe without losing air.

While the pressure of air behind the column of water is constant, the air is used only when water is drawn. When all outlets are closed the pump does not operate, though the pressure is maintained throughout the system at all times. The reservoir is provided in order that a reserve of power—compressed air—may be stored. The reservoir is usually charged to considerable more pressure than is needed to raise the water, the pressure being reduced to the proper tension before it enters the pump. The excess of pressure furnishes a storage of power, the compressor operating occasionally to renew the charge of air. In some cases sufficient storage of air is provided to last from one to two weeks.

In point of practicability the pneumatic system has many excellent features. The air-compressing outfit which may be operated by any available power, may be located at any convenient place, regardless of distance from the source of supply. The source of supply may be a lake, spring, cistern, well or whatever conditions offer.

Any well, however small, may be used, as it only requires the additional piping to bring the water to the surface by compressed air, employing what is known as the air lift. The pneumatic pump in this case is placed in a small receptacle at the top of the well, from which point it delivers the water through the mains. No extra machinery is needed, except a small device for automatically regulating the flow of water into this receptacle or intake.

As to the efficiency of this system it will suffice to say that an air reservoir of 500 gallons capacity, charged to a pressure of 60 lbs. and raising water to a height of 30 feet, will deliver 828 gallons of water.

Another feature is the “elasticity” of such a system. Should it be desired at any time to double its capacity, one needs but add a pneumatic pump with proper pipe connections and use air from the same compressing outfit. Or, if soft water is required, simply place a pump in the cistern, teeing off the main air line for power, and pipe the soft water to the house. Air may be piped any distance, so the compressing outfit need not necessarily be near the source of supply.

The many advantages of this system are worthy of more than casual notice. The entire system can be made automatic, needing no attention other than occasional oiling of the air compressing apparatus. It is easily installed by any mechanically inclined person.

Practical Acetylene Illumination

By A. Cressy Morrison

The extraordinary development of the acetylene industry, presenting as it does a practical means of illumination for country homes, detached buildings, hotels, sanitariums, institutions and the American farm home, demands the careful attention of the carpenter and builder, no matter where located. Sooner or later he will be called upon to meet the requirements of this system of illumination, and while it is true that the application of acetylene has been largely out of the cities, it is now being rapidly introduced in the manufacturing establishments everywhere for the purpose of autogenous welding; that is, the welding of two pieces of the same metal by literally melting the edges together. Every boiler shop, repair works, iron foundry, steel foundry, railroad shop and in fact every metal working establishment will ultimately be using this extraordinary process by which the most intense heat in chemistry is concentrated in a pencil point.

The necessary structures and provisions for this new subsidiary industry must be provided by the carpenter and builder. Conditions in this field are, however, so very different in each establishment that no fixed method of procedure has yet developed. In the lighting of detached buildings, however, the methods have been so fully worked out that a description general in its terms will probably apply in most instances.

The basis of acetylene illumination is calcium carbide. This is a rock like substance produced by literally melting lime and coke in the electric furnace, whereupon they combine chemically, forming calcium carbide. This substance, having been subjected to a temperature of 6,000 degrees Fahrenheit is thereafter totally unaffected by any temperature or by chemical reagents, except only water. The moment it comes in touch with water a chemical change takes place by which the carbide is transformed into lime and the carbon joins the hydrogen of the water and forms an extremely rich gas called acetylene.

In the utilization of this gas regular gas piping is used throughout the house, differing only in the fact that the pipes may be smaller than for ordinary city gas and that the burners are especially designed to handle this extremely rich illuminant. As the methods of ordinary piping are so well understood, description is of course unnecessary, but to those unfamiliar with the subject it may be well to state that ordinary gas burners will not do. The special acetylene burner burns but one-tenth as much gas as the ordinary city gas burner but gives, nevertheless, an equal amount of light. Its structure is also peculiar and must necessarily be of a special nature to prevent carbonization and what are known as burner troubles. As, however, an acetylene burner is to be had anywhere, it is only necessary to state the fact that they must be used, as other burners will not do.
Eliminating the piping from the discussion, the question of the utilization of acetylene in any structure reduces itself, from the standpoint of the carpenter and builder, to the proper housing or placing of the acetylene generator. The acetylene generator is a mechanical device by which the carbide is dropped automatically into a body of water and the resulting gas transferred to a movable bell from which it is piped throughout the building. This generator varies in capacity and dimensions in accordance with the requirements of the case. Each manufacturer of generators having developed his own ideas, the dimensions differ, but usually they are constructed so that they will go into an ordinary cellar or basement with enough head room for operation and allowance of a few inches for a platform on which the generator can be placed. There are two methods of placing generators; one is an outside installation, in which case the generator is placed in an out building or in a special structure built for the purpose and no special requirements are necessary for this structure, aside from the fact that it should be made as proof against cold as possible. The necessity for this arises from the fact that the water in the generator and in the gas bell container is liable to freeze and stop the operation of the machine. This brings in complications which must be absolutely guarded against.

When an acetylene generator is placed in a basement, it must be placed in accordance with the insurance regulations and should be at the point farthest removed from the furnace or any artificial light. It should be placed upon a stout platform, four or five inches above the floor of the basement and head room for operation should be provided. If it is possible to place the generator where the light from the basement window will fall upon it, it is desirable as no artificial light should be used when the generator is being charged with carbide or the residue removed.

When installed in accordance with the insurance regulations, the acetylene generator is probably the safest source of illumination which can be selected; in fact, the Board of Engineers of the National Board of Fire Underwriters, after a year's exhaustive investigation, declared it was safer than the illuminants which it replaces. This factor is going far to stimulate the rapid introduction of acetylene generators throughout the country.

There is, however, an additional feature which is aiding materially in the advancement of the acetylene industry, and that is the fact that the recharging of the generator requires but half an hour's work once a month, whereas other illuminants, especially where lamps are used, require almost as much work each day. By the use of electric ignition, which is now practically and economically available, the use of matches is avoided. This removes from the household one of its greatest sources of danger.

With the exception of New England, where special regulations are still enforced, the acetylene generator may be placed inside of insured premises by securing a permit from the insurance company, for which, however, no charge is made.

It is well also to provide a place for the storage of calcium carbide which shall be dry and removed from possible danger of a flooded cellar or any other accident which would bring water into contact with the carbide. The carbide comes packed in air-tight and water-tight drums and the suggestion given above is merely reasonable caution against any possible combination of neglect or foolishness.

The operation of the generator is extremely simple in principle, though the insurance requirements, born of expert engineering experience, have made the mechanism of the generator an unusually well developed mechanical device. The carbide drops in a very small quantity into the water, a considerable volume of gas is produced, the gas raises the bell immediately and the bell shuts off the supply of carbide until sufficient gas has been drawn from the bell to lower it to the point of operation again.

The charge of carbide varies with the capacity of the machine from twenty pounds to two hundred pounds. The amount of gas given off by a single pound of carbide is five cubic feet. Five cubic feet of gas will last for ten hours in a half-foot burner which yields as large a light as a five-foot burner burning city gas. The light is soft and brilliant and is the nearest approach to sunlight of any of the artificial illuminants. The industry has reached a point where the carbide, the mechanism for transforming it into gas, methods of piping and the burner have reached mechanical perfection and the astonishing fact that over 150,000 buildings and 315 towns are illuminated by acetylene in the United States alone and that these are increasing remarkably, demonstrates the fact that the light has come to stay, that it is acceptable and that as the installation is extremely simple and not expensive, the carpenter and builder are safe in recommending it.

Acetylene is used for lighting small towns, and in this case a structure called a generator house must be provided. Its dimensions and peculiarities depend entirely upon local conditions and undoubtedly will be specified by the contractor who builds the gas plant itself. Therefore, no description of this structure is needed at this time.

Panama Canal Half excavated

The grand total of canal excavation down to the first week of October was 87,494,537 cubic yards, just one-half of the total excavation to be made for its completion. Of this great amount 64,738,051 cubic yards was excavated since January 1, 1908, as compared with the 22,756,486 cubic yards excavated in the four previous years of American possession.
Gasoline Lighting for Country Homes

THE USE AND ADVANTAGES OF THIS MODERN SYSTEM OF ILLUMINATION—HOW IT IS OPERATED—APPROXIMATE COST

TEN years ago it was customary for the man who was showing his country home to his friend from the city to say apologetically, “Of course, we haven’t the conveniences here that you have in the city, but then, you can’t expect to have everything you want when you live so far away from the city.”

But of late years modern progress and invention has given more serious attention to the home in the small town and in the country, and there is also a growing disposition on the part of the man who dwells “far from the madding crowd” to insist on just as much comfort as his city brother.

It is now no uncommon occurrence to find a country home equipped with bathrooms, hot and cold running water, and lighting gas piped into every room in the house.

In this latter particular, country homes have felt the greatest need. Sociability and comfort after night fall calls for clear brilliant light and plenty of it, and the idea that the country was a dull place originated probably by the sight of a family sitting around a dingy, smoky kerosene lamp, trying to peer through the gloom, and pass the evening reading or playing games by its imperfect light.

There are several forms of relief now offered the suburban or rural home, and among the best of these are the gasoline lighting outfits, which give the home what is actually a gas plant of its own right on the premises. One of these ingenious inventions can be set up in a corner of the basement or cellar, and requires little or no attention at all.

It supplies a gas that is perfect to the different rooms of the house, just like city coal gas, and like city gas, it can be used equally well for both heating and lighting, and the light produced is clear, white and brilliant. The gas is ready to turn on and light at any time. No generation required.

The fuel used is gasoline, stored in a carbureter outside of the house, and buried in the ground. In most cases it need be filled with fuel about once every six months, and needs no other attention. The principal parts of the machine in the basement are a pump, which works with a weight, and is wound up in a few minutes every few days, and an automatic mixing regulator, which needs no attention whatever.

This latter feature is found only in the most modern machines, and is deserving of a little special mention. Without it, lights from gasoline gas are liable to change and vary, depending on the age and quality of the fuel, but with this ingenious device the gasoline vapor is mixed and automatically held in correct proportion, which is 15 per cent vapor to 85 per cent air. The result is a clear, white light that does not smoke or fill up the room with noxious odors.

Experience has shown that gas can be produced by this method at a cost not to exceed one dollar per thousand feet, which will make the cost of light at an 80-candlepower burner figure about one-fourth of a cent per hour. This is very low, indeed, and few city dwellers can buy their light any cheaper than this.

These machines are made in various sizes, and can be used to light the home, or to light entire villages and communities on a co-operative basis. They are to be classed as among the most beneficial inventions produced today for the rural home.

Reinforcing the Gatun Locks

“The mere mass of the concrete floor and side walls of the locks at Gatun will be sufficient to give them great stability,” says The Scientific American, “but, with a view to adding a further safeguard against rupture in the event, say, of earthquake shock, the government engineers intend to reinforce the concrete by embedding in it no less than seven thousand tons of old rail. This metal consists partly of a light rail which was used during the era of French construction, and partly of more modern American rails, which have been so badly bent that they can no longer be used in the track.”

Anti-Freezing Mixtures

The following are rules for avoiding freezing of water in the cylinders, pipes, radiators, etc., of the cooling system of water-cooled automobile engines and stationary explosive engines. As soon as freezing weather approaches or when the temperature drops as low as 40 degrees F., all water should be drained from the radiator, cylinders and pump, says Gas Review, and the radiator filled with one of the solutions given.

1. A mixture of glycerine and water in the proportion, by weight of 25 per cent of the former and 70 per cent of the latter, to which is added 2 per cent of sodium carbonate.

2. Chemically pure calcium chloride dissolved in water in the proportion of 4 pounds to one gallon of water.

3. Sodium chloride (common salt) or magnesium chloride dissolved in water in the proportion of 11/2 to 2 pounds to the gallon.

4. Wood alcohol in the proportion of 20 per cent alcohol to 80 per cent of water. This solution has the advantage of being sufficient for average winter weather, and it has no ill effect of any kind on metals nor does it leave any sediment.

Should the thermometer reach as low as 15 degrees F., a solution of about 25 per cent alcohol and 75 per cent water should be used. For temperatures below zero, use 30 per cent alcohol and 70 per cent water.
Desirable House and Bungalow Designs

PHOTOGRAPHS AND FLOOR PLANS OF FIVE VERY ATTRACTIVE LITTLE HOMES—FEATURES OF CONSTRUCTION AND FINISH—CERTIFIED COST

It is always the greatest help, both to the prospective home builder and to the architect or building contractor who would “land” his prospect, to have on hand some attractive exhibits—photos and floor plans of actual work. Most every man, when he comes to want to build, has some general notion as to the size and style of the house he would like, yet his ideas are extremely hazy, making it difficult to go ahead, at least with any certainty of pleasing.

From photographic views of actual work, however, the prospective builder, even though ignorant of architectural terms, can tell what he likes and what he doesn’t, making it easy for the experienced designer to give him what he really wants.

Five Room Bungalow

The first, a 5-room bungalow, was built at North Abington, Mass., about three months ago. As finished it cost $1,600. This bungalow was left in the rough, the frame and boarding being dressed on the inside and the boarding matched. The living-room is open to the roof, which with the big fireplace makes an attractive room. The alcove off the living room is used as a dining-room and may be separated from
the living-room by portieres hung under side of beam. Over this alcove is a sleeping-room, which is reached by stairs shown. The big dormer window in this room makes it practically an outdoor sleeping-room, as it is

split from the upper part of the living-room by a balustrade 3 feet 6 inches high.

All floors are of hard wood. The living-room trim is stained a deep green; the kitchen is finished natural; bedrooms are stained brown. The outside of this bungalow is covered with slapdash cement stucco on wire lath. The roof is of asbestos shingles. All windows are casements to swing out. There is a cellar under the main house.

**Story-and-Half Mission Cottage**

The next is a design for a small house combining simplicity, beauty and homelike appearance. The broad, low and well-sheltered front porch with large, square columns, the low overhanging eaves of the main roof and the perfectly proportioned dormers in the second story provide an exterior which is simple and at the same time beautiful. The staircase hall is large, and the main landing is provided with a window seat. An arched opening, having square columns with heavy mission capitals and beams overhead, leads from the hall to the living room. The mission design is carried to the bracket shelf of a corner mantel of red tile in the living-room. There is also an arched opening between the living-room and the dining-room. A pretty feature of the dining-room is a deep bay, which has five leaded glass casement windows. This room also has a coved ceiling and a plate rack. Pantry contains porcelain enameled sink, kneading boards, drawers and

are 26 by 28 feet; first story, 9 feet in height; second story, 8 feet 6 inches; basement, 7 feet 6 inches.

The 8-room house illustrated on page 353 is of a very desirable, economical design. It furnishes pretty nearly a maximum of size and convenience for the amount expended. It is a design especially good for a narrow lot. This house has been built at Oshkosh, Wis., for $3,000.

**Seven Room House**

The fine 7-room residence shown on page 354 was completed last month at Brockton, Mass., for $4,200. This price included everything to complete the house ready to occupy. The house has the best of materials
Desirable House and Bungalow Designs

Photographs and Floor Plans of Five Very Attractive Little Homes—Features of Construction and Finish—Certified Cost

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From photographic views of actual work, however, the prospective builder, even though ignorant of architectural terms, can tell what he likes and what he doesn’t, making it easy for the experienced designer to give him what he really wants.

With this in mind we present herewith photos and floor plans of five practical and desirable homes. They differ widely in style, size and cost. Each has worked out very successfully in actual construction. They will supply many valuable ideas to builders.

Five Room Bungalow

The first, a 5-room bungalow, was built at North Abington, Mass., about three months ago. As finished it cost $1,600. This bungalow was left in the rough, the frame and boarding being dressed on the inside and the boarding matched. The living-room is open to the roof, which with the big fireplace makes an attractive room. The alcove off the living room is used as a dining-room and may be separated from...
the living-room by portieres hung under side of beam. Over this alcove is a sleeping-room, which is reached by stairs shown. The big dormer window in this room makes it practically an outdoor sleeping-room, as it is

separated from the upper part of the living-room by a balustrade 3 feet 6 inches high.

All floors are of hard wood. The living-room trim is stained a deep green; the kitchen is finished natural; bedrooms are stained brown. The outside of this bungalow is covered with slapdash cement stucco on wire lath. The roof is of asbestos shingles. All windows are casements to swing out. There is a cellar under the main house.

Story-and-Half Mission Cottage

The next is a design for a small house combining simplicity, beauty and homelike appearance. The broad, low and well-sheltered front porch with large, square columns, the low overhanging eaves of the main roof and the perfectly proportioned dormers in the second story provide an exterior which is simple and at the same time beautiful. The staircase hall is large, and the main landing is provided with a window seat. An arched opening, having square columns with heavy mission capitals and beams overhead, leads from the hall to the living room. The mission design is carried to the bracket shelf of a corner mantel of red tile in the living-room. There is also an arched opening between the living-room and the dining-room. A pretty feature of the dining-room is a deep bay, which has five leaded glass casement windows. This room also has a coved ceiling and a plate rack. Pantry contains porcelain enameled sink, kneading boards, drawers and

are 26 by 28 feet; first story, 9 feet in height; second story, 8 feet 6 inches; basement, 7 feet 6 inches.

The 8-room house illustrated on page 353 is of a very desirable, economical design. It furnishes pretty nearly a maximum of size and convenience for the amount expended. It is a design especially good for a narrow lot. This house has been built at Oshkosh, Wis., for $3,000.

Seven Room House

The fine 7-room residence shown on page 354 was completed last month at Brockton, Mass., for $4,200. This price included everything to complete the house ready to occupy. The house has the best of materials
and every improvement. The rooms are large and well lighted. The house is wired for electric lights and piped for gas, combination fixtures being used. All the rooms throughout the house have hardwood floors, stained and oiled. The parlor and sitting-room are painted a cream white; dining-room stained: kitchen, entry and bath finished with North Carolina pine, finished natural; chambers painted.
Eight-Room House of Dignified Design, Built at Oshkosh, Wis., by Fluor Bros. Construction Co., Cost $3,000

The two central chambers have large dressing-rooms attached which contain hooks, shelves and wardrobes. The owner has the attic fitted up as a billiard-room.

The plumbing is No. 1 grade, both in kitchen and bath. The bathroom is one of the special features of this house, being about twice as large as the ordinary bath and containing a case of drawers, medicine case and linen closet. This linen closet has three large drawers, above which are shelves spaced to ceiling. The house is heated by steam. The price stated includes paper, shades and screens.

House with Dormer Windows

A very cozy dwelling is illustrated on page 355, the residence of Mrs. Robert D. Sampson, near Coolidge Point, Mass. The exterior finish of the house is of stucco, its soft cream tones contrasting with the cypress trim, which is stained a dark brown. The deep pitched roof, curved from the ridge pole to the eaves, extends

at the front to form a covering for the broad veranda; it is shingled and painted to match the trim, and is broken at intervals by large dormer windows.

The simplicity and compactness of this pretty home is a pleasing variation from the stately pretentious beauty of the majority of homes in this neighborhood. In fact, it is its very simplicity that constitutes its chief charm.
How to Paint a Bath Tub
Assuming that it is an old metal tub which has never been painted. First—the tub should be thoroughly cleaned. To do this, wash it with soap and water, or with soda, or with sapolio, in order to get bristle brush in putting it on and being careful not to get on too thick a coat. Allow this coat to dry for at least 24 hours, when a second coat of this same lead should be applied in the same way and allowed to dry also for at least 24 hours. The tub is now ready

off the grease; then rinse out with clean, hot water, wiping dry with dry cloths. Then roughen up the surface of the tub by going over it with fairly coarse sandpaper, and wipe out the little dust and dirt produced by the sandpaper with a dry cloth. The tub is now ready to be painted. The first coat should be white lead in oil thinned with turpentine, using a flat for the coat of enamel, using a kind especially made for such purposes. Open the can, stir the enamel thoroughly and apply with a flat bristle brush, carefully and evenly. One coat of this enamel is sufficient, which should now be allowed to dry from four to six days. When you again commence using the tub do not allow hot water to run into it first, as it may soften up the enamel. If the tub has been painted in the past, the old paint should be scraped and sandpapered off before painting.

Ignorance may mean bliss in some jobs; but in the paint business it more often means blisters.
Rochester's Competition for Small Houses

IN THE spring of 1908 the Chamber of Commerce, of Rochester, N. Y., inaugurated their competition for single and detached cottages, the object being to assist in providing low cost dwellings for the working men living in the suburbs or outskirts of the city.

The program called for three classes of cottages, $1,500, $1,200 and $1,000 respectively. Prizes were offered for the three best designs in each class. The accompanying design, submitted by Johnson & Schenck, architects, was awarded first place in the $1,500 class. It is a 6-room cottage 23 feet 6 inches by 24 feet with all the conveniences of an attractive modern home.

The houses were to be built upon city or town lots not less than 40 by 100 feet, in blocks of ten, each house to contain a bathroom with three fixtures, a kitchen sink, sewer, water and gas connection to street, heat pipes and registers for future furnace, cellar and foundation excavations to be in earth.

The program stated that the style of construction and materials used was optional.

With a liberal interpretation of a very liberal program the material selected by Johnson & Schenck for the exterior was lime plaster upon wood lath. A precedent for this material is found throughout Quebec and Ontario, Canada, where it has been successfully used for more than seventy years, proving conclusively that plaster when well applied can be depended upon as an exterior wall covering. Exterior plastering may be applied in several ways, and below we show three sketches, any one of which could be followed in this competition.

Fig. 1. The exterior lath is directly nailed to the studding in a diagonal manner with a space of 1 inch between laths; over this in the opposite direction another layer of lath is nailed, this diagonal lath forming a good system of bracing for the entire building.

Fig. 2 has good thick building paper applied directly to the studding; over this paper and to the studding are nailed strips of 1 by 2 inch, to which is nailed the lathing in the regular way.

Fig. 3. The 3/8-inch boarding is nailed to the studs, and over this sheathing is applied the building paper fastened by having strips of lath nailed vertically, these strips giving a key for the exterior plaster.

The surface of exterior plaster can be made thoroughly waterproof with an application, after one year or eighteen months, of three coats of lead and oil.

For economic reasons the method shown in Fig. 1 was followed in this competition.

The next important economical point in construction was the introduction of casement sash with small lights of glass 9 by 12 inches, the sash opening outward to admit of the use of fly screens. The frames were solid, thus making a saving in the omissions of either outside or interior casing.

Another item was the introduction of girders in the floor construction, which allowed the use of smaller joist, 2 by 4 inches, set 16 inches on centers, and the omission of the usual bridging.

The doors were designed of V-jointed boards placed vertically with cross battens and long strap hinges. The jambs were solid of 3 by 5 inches and flush with the plastering, avoiding the use of an interior trim.
In the planning of the house the square form of plan was adopted, as it presents a greater amount of floor area than the long, narrow plan. This can be easily illustrated by comparing the cubic contents of a plot 4 by 4 feet, or 16 square feet, and a rectangle 8 by 2 feet in which the former has 16 feet of wall surface against 20 feet in the latter case, yet the areas are precisely the same.

The stair hall was separated from the living-room and the stairs made convenient to the front door, which, in turn, is of easy access to the kitchen. The dining room is separated from the living room by an arched opening, and so placed that, while it is convenient to the kitchen, it also has the privacy which is so desirable in a house of this kind where the family can dine without being disturbed by the stranger who is likely to step in at unexpected moments.

The inglenook in the living-room is the predominant "feature" of the plan. It has two comfortable high back seats at each side, far enough away from the blazing logs to make the heat agreeable. The projecting mantel shelf supported by heavy wood brackets and the dark stained wood wainscot at either side form a rich contrast to the rough brick fireplace with wide mortar joints between the brick.

It will also be noted that the entire heating system is controlled through the one chimney. This has its decided advantage when the matter of cost is considered, especially since, owing to its central location and construction, no face brick is required on the exterior of the building.

On the second floor there is a large double bedroom with a balcony on the front. There are two smaller bedrooms. Each room has a closet and there is also a large linen closet or storeroom. There is absolutely no space wasted in the hall, and the bathroom is easily accessible from all of the rooms.

Another economical feature was the arrangement of placing the bathroom plumbing directly over the line of the kitchen plumbing in the first floor.

The chimney flues are all lined with terra cotta pipe their full length, and the latter extend about 15 inches above the top, giving the effect of chimney pots at a much less cost. By the use of flue linings the thickness of brick around the flues is reduced to a minimum of 4 inches.

In designing the exterior the architect made the idea of simplicity in form and detail a predominating factor. There are no unnecessary brackets or dentils and no overloaded masses of dormers and projecting bays. The gambrel roof brings the main cornice nearer the ground than any other form of roof, and thereby aids in preserving the low effect, which is a difficult problem in designs of this nature.

The curved line over the balcony and the irregular cut end of the porch seat break up the horizontal line.
effect of the front elevation. There is abundant light in all the rooms. The casement windows, consisting of a number of unit sash, are a saving to the millman, and also give dignity and harmony to the exterior.

The interior woodwork of this house is intended to be stained throughout a rich brown color and all exterior wood to be stained a darker shade, including the roof shingles, which should be a trifle lighter in tone. The muntins and sash should be painted white, and the exterior plaster left its natural color. The interior walls may be plastered with a rough sand finish, and in this case no papering will be necessary.

The builder who submitted the bid agreed to build ten cottages from the drawings and specifications for $15,000, which is about 14½ cents per cubic foot.—The American Architect.

Tilting Flour Bins

There is probably no part about the planning of a house that requires more attention from a woman's standpoint than the planning of the kitchen and pantry. To save the time and labor of her whose work is never done, is no slight task for the architect. Tastes vary as to conveniences, and the architect must in a measure work to her individual notions. For instance, one wants flour bins to be just so and so, while another would not have the pesky thing in the house. A large drawer is just the thing! It can be taken out, sunned, etc., and so it goes.

From our own experience, we believe in a movable tilting bin made large enough to receive a sack of flour without emptying and here submit a few sectional views of such bins.

Fig. 1 shows the bin to be swung on a pivot, as shown at A, which can either be a hardwood pin inserted in the sides, or an iron plate screwed onto the side, the pivot resting in a socket made in the frame work. It should be located a little to the front of the center of the bin.

Fig. 2 shows another form of bin with the bearing on the bottom. This allows the bin to swing outward and remain open.

Fig. 3 shows another form of bin similar to No. 2, but the bearing is at the front. This bin has a button on the back side of the front framework to prevent the bin from tipping too far out. The face of Fig. 2 and 3 can be finished with a lip, giving it a more finished appearance; but Fig. 1 cannot be so finished on account of part of the bin swinging inward. Either of these bins can be readily lifted out of place for cleansing purposes and as easily set in again as there is nothing about their construction to get out of order.

A “How to” Tragedy

Smith liked to study “how to” books, to add unto his knowledge—
On how to shave on railroad trains and how to sidestep college,
And how to make the hen game pay and how to write short stories,
And how to raise prize cabbages and also morning glories;
The latest of these wondrous works on which poor Smith has blundered
Is “How to Build a Bungalow for Less Than Seven Hundred.”

It seems Jones lent the book to Smith, just as a passing favor,
For Smith was just about to build and sought a money saver;
Now Smith has spent three thousand flat and seeks still more to borrow,
The while the roofless bungalow looks like a haunt of sorrow;
And so alas! it comes to pass a friendship firm is sundered
By “How to Build a Bungalow for Less Than Seven Hundred.”

—Denver Republican.
Desirable Stock Barn and Store House

Perspective and plan of a very well planned farm building arranged for horses and dairy stock, feed and implement storage.

A GOOD many farmers like to have all their farm buildings grouped together under one roof. They find that such an arrangement is a great comfort and convenience in caring for the stock and doing the other chores, especially in bad weather. The accompanying design illustrates this. Twenty-four milch cows and eight horses are stabled and ample feed storage is provided. The open space for vehicles and implements is a desirable feature. In construction this barn is economical.
Christmas Gifts of Modeled Leather

TIMELY SUGGESTIONS FOR THE HOME-CRAFTSMAN—SIMPLE AND COMPLETE DIRECTIONS FOR DOING THIS INTERESTING AND PROFITABLE WORK

LAST December we described simple pieces of sheet-metal work suitable for Christmas presents. At that time we promised our readers an article on modeled leather work for this Christmas. This craft, in its simpler applications, is quite as easily learned as the metal work and the articles are as fully, if not more, acceptable.

The equipment is very simple and inexpensive.

Two simple methods of treating the leather surface are (1) to stamp or stipple the outline with a tool, (2) to lower the background by means of a tool, called a modeling tool.

We shall describe the manner of making a bill book, which will illustrate the general order of procedure.

The first thing necessary is a pattern. A drawing board, T-square and triangle are convenient, though not absolutely necessary in making this. Place a sheet of ordinary drawing paper upon this board and make a drawing as in Fig. 1. The dimension lines, however, should be omitted.

In the space marked (x) is to be placed the design, which shall appear on the front of the book. For a symmetrical design the lines AB and CD should be drawn so as to divide the space into four equal parts. Then with a rather soft pencil draw one-quarter of the design. Fold the paper carefully along AB and trace another quarter by rubbing with a chisel handle the back of the quarter just drawn. Now fold along CD and trace the remaining half. If the same design is to appear on the back, fold along ef and trace. Go over the whole design with a pencil so as to make it distinct. Experience has shown that well spaced simple designs are as effective as any. Care must be taken that plenty of unstamped surface shall appear. If necessary stamp in the design and leave the background; though in general the background should be stamped. In order that the design may be easily placed in position on the leather it is advisable to trim off the surplus paper.

Provide yourself with a modeling tool (Fig. 2), a nail set with a hollow point, and a light hammer or mallet. All that is needed to complete the equipment is something smooth and hard upon which to work. Marble or heavy glass will do. The writer used a sheet of brass screwed onto a block of wood, as in sheet-metal work. Wood will not be satisfactory, as it absorbs the moisture from the leather and is not hard enough. A pan of water and a sponge will be needed.

The leather should be cut about a quarter of an inch larger all around than the pattern. A knife and a straight-edge are needed for this.

Take a piece of leather and with the sponge and
water moisten it on the back—the rough side. It is difficult to say just how much to moisten, as some pieces take more water than others. In general, a few times across with the sponge will answer. If the leather then does not take the impression of the tool, moisten again slightly until it does. It has been given too much water if dark spots begin to appear on the face side, and should be allowed to dry some before being worked. The leather should be kept moist while being worked.

Place the leather upon the metal with the smooth side up. The next step is to trace the design onto the leather. It is possible to devise a way of fastening the design and leather together upon the block, but not without some loss of material.

All straight lines of the pattern, including the outer edges, should be traced with the V-shaped point of the modeling tool (Fig. 2), aided by a straight-edge. Care should be taken to make sharp corners and not to cut the leather.

While the tracing is done over the pattern, the pattern need not be injured if the work is carefully done. The design may be traced onto the leather with a pencil as the paper keeps it from discoloring the leather.

Remove the paper and go over the design again, using the V-shaped point of the modeling tool, aided by the straight-edge, for the straight lines, and the other point of the tool held so as to make as narrow a line as possible for the design.

With the hollow-pointed nail-set and hammer stamp in the background, being careful not to strike hard enough to cut the leather. If necessary, put the nail-set on the stone to take off the sharpness of the edge.

Now cut along the lines which were traced from the lines gh and mn (Fig. 1), and fold along the lines traced from ij, ef and kl (Fig. 1), tapping lightly with the hammer to flatten the folds.
Artistic Leather Purse and Card Cases—they are decidedly worth while.

Sew along the ends and cut off the surplus leather and the book is ready for use. In all cutting, a sharp knife and straight-edge serve best. The leather, though thick, is soft, and may be sewed on the sewing machine.

The manner of procedure in making the card case ends are of various sizes and suggest the uses to which they are to be put. Leather, like wood, has grain, and if you find the surface roughing up, as you try to press it down, rub in the other direction.

Many things which can be made will suggest themselves to you. Small mats, stamp books, covers for note books, bags, belts, magazine covers, portfolios and many other things can be made. Suggestions from the accompanying photographs can be used. In one of the illustrations the two book covers in the foreground are neither stamped nor modeled. They are of goat skin with the oozed side out. This leather can be obtained in the most beautiful soft colors and can be worked up in many ways. The other pieces shown in this photograph have the entire backgrounds lowered.

Frequently the background is worked down only about the design. To aid in raising the design modeling wax is sometimes placed under it as the tooling proceeds. Again, stamps of different designs are used which, when properly combined, produce beautiful effects.

A word of caution is necessary. All kinds of calf skin will not model. Some colors work better than others. The safest way is to order of those who make a business of supplying this trade.
How to Make a Dictionary Stand

COMPLETE DIRECTIONS FOR MAKING THIS SIMPLE THOUGH USEFUL PIECE OF FURNITURE—THE NEW "FOREST_GREEN" FINISH DESCRIBED

A DICTIONARY stand of simple design and construction is offered this month in addition to the Christmas leather work of the preceding article. It will not take long to make it.

Use either red or white oak. Since the pieces are mostly square it will hardly be worth the extra expense to specify quarter-sawed stuff. Order as follows:

STOCK BILL FOR DICTIONARY STAND

1-piece, 134 inches by 134 inches by 39 inches, S-4-S.
2-pieces, 134 inches by 134 inches by 201/2 inches, S-4-S.
1-piece, 3/4 inch by 61/4 inches by 101/2 inches, S-2-S.
1-piece, 3/4 inch by 121/2 inches by 221/2 inches, S-2-S.
4-pieces, 11/4 inches by 41/4 inches by 61/2 inches, S-2-S.
1-piece, 31/4 inch by 11/2 inches by 221/2 inches, S-2-S.

It is possible to save a little expense at the mill by combining pieces of similar thickness and width before ordering.

Begin at the top first, squaring it up to a width of twelve inches and a length of twenty-two inches. The under piece is to be finished to six by ten inches. Level this piece on the under side to one-quarter of an inch. Square one end of the upright, measure the length and cut the top end to an angle of thirty degrees, planing it smooth.

To make the braces, square one edge and one end of each; then place upon these a paper pattern previously prepared which shall have the shape of the curve, full size. Mark around this pattern. These brackets are to be fastened to the frame by means of round head blued screws and will need holes at either end three-sixteenths of an inch in diameter. In putting these brackets in place do not undertake to fit them to any irregularities in the corners but draw the corners up to fit the bracket.

The curves of these brackets are to be cut with the compass saw and smoothed with the scraper.

ASSEMBLE the lower part first. Use a one-quarter by two and one-half inch lag screw to fasten the parts. A one-quarter-inch bit will be needed to bore the hole through the base for this. Fasten the braces in place.

It is possible that some difficulty may be experienced in getting these to fit properly. This will be due to the joint of the base pieces being fitted too snugly. In such a case the pressure on the sides of the joint will cause one of the pieces to be bent below the level and the other above. The defect can be remedied by trimming the sides of the joint until it shall fit just right, with no side pressure.

Since the top fits to the post at an angle, it will be necessary to chisel a seat in the top of the six-by-ten piece for the head of the lag screw. The under side of this piece must be chiseled to a depth of one-quarter inch to allow the end of the post to be let in.

The top itself is fastened to this piece by means of round head blued screws through the under piece, one at each of the four corners.

The lip for the top is beveled on one arris only and is fastened to the lower edge of the top with three round head screws.
The New "Forest Green" Finish

Either a light or dark finish will be suitable—the finish of the other furniture in the room in which it is to be placed determining.

If one wants something new and unusual in the way of a finish, here it is. The finish is known as Forest Green and is very soft in color, a shade of yellow green. Proceed as follows: Put on a coat of forest green water stain. When this has dried over night sandpaper lightly with fine sandpaper, No. 00, long enough to remove the "whiskers" which the water stain raised, then put on a second coat of stain mixed with an equal volume of water. Upon this put a thin coat of shellac. This is to prevent the coloring matter of the filler from discoloring the high lights. The shellac being thin does not interfere with the filler entering the pores of the wood. Prepare the paste filler by coloring a natural filler with chrome green to the proportion of twenty pounds of filler to one pound green. When dry, sand lightly and apply a coat of thin shellac. Sand this lightly when dry and apply several coats of wax.

How to Secure Artistic Walls

THE day of freakish attempts at wall decoration is rapidly passing. The spread of such a large amount of good reading in magazines and books has helped to educate people, especially women, to better standards in interior decoration.

An added force, and a force that must be reckoned with, is the teaching in schools and colleges of domestic art along the lines of the correct treatment of walls, how to handle colors, and how to arrange furniture and hangings.

We can easily recall the over-decorated cozy corners that were far from cozy, the Moorish rooms filled with a heterogeneous mass of so-called bric-a-brac—the big gorgeous roses on glaring walls, the decorated pie pans, water pails and bootjacks that were forced into an unwonted service in an attempt at artistic effects.

We know better now. Out of that incongruous, mixed-up mass, we have come to saner conditions and simpler decorating.

Art is not a striving after effect, but rather an achieving of suitable results. It produces rooms that are pleasant to live in, comfortable to sit in, delightful to rest in and usable as well.

Walls are not surfaces for mere decorative effects, but they are backgrounds for furniture and furnishings as well as barriers, giving privacy and comfort, seclusion and rest.

With this thought in mind the color treatment of the wall surface is easily handled. The solid colored, softly tinted wall has been found to give universal satisfaction.

An excellent and most popular combination is the use of the soft, delicate sage gray tint for the lower two-thirds of a wall, with upper third and ceiling...
white. Stencil on this a rose design in green leaves and pink roses.

How to Space a Wall

In every job of interior decorating which calls for wall work, the question of correct spacing is inevitable. Some ceilings are too high and the room has the appearance of a deserted hall or opera house. Other rooms are too squatty and box-like, because the ceiling is too low. Others are difficult to handle because of the uneven heights, the varying heights of doors and windows.

In the very practical illustrations shown these problems have been worked out in a way that may be a help to some other decorator and painter.

In Fig. 1 the ceiling was too low; to give the effect of height, a single paneled door was introduced. The door and window being of uneven height, an extra molding was added to the door trim to even it up.

Fig. 1. To Make a Low Room Look Higher
Dimensions 8' x 12', Door Opening 2½' x 6'. Window 2½' x 5'

The apparent height of the door is equalized by the introduction of two panels.

In Fig. 3 height is secured by the use of a single color to the ceiling, and the absence of horizontal lines. If perpendicular lines or stripes were used the apparent height would again be increased.

As a broad principle in decorating, vertical lines increase height and horizontal lines diminish it.

The introduction of patterns such as used on wall paper makes the room look smaller, because it seems to advance the wall toward you.

Panelings break up large flat spaces into more interesting effects, and make a room easier to furnish; they relieve the sense of bareness.

Friezes are good when they do not sacrifice the appearance of height and lessen the dignity of the room.

Fig. 2. To Modify Excessive Height
A plate rail was used about two-thirds up on the side wall, and light soft color was used for the portion of the wall. For the upper third a still lighter tone, and for the ceiling, white. The effect secured was that of apparent height.

Fig. 2 shows the result of dropping the plate rail to the middle of the wall; the effect of excessive height is lost, and the room seems of lower proportions. Use a dark color on the lower half, and you have a still lower effect; use a tint on your ceiling, and again you lower the apparent height. The apparent height of the door is equalized by the introduction of two panels.

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There is a refinement about bands and beadings when used intelligently that has made them very popular.

But this matter of spacing a wall correctly is easy if you know how—and it is very easy to know how when the exact area of the room is estimated. Most rooms need balance: spacing gives that correctly.

How to Stick Leather on Metal

In order to fix leather to metal, dilute one part (weight) coarsely crushed gall nuts with eight parts (weight) of distilled water about six hours, and filter through linen. Then pour one part (weight) of cold water over one part (weight) glue, let it stand for 24 hours and heat the whole, whereby a concentrated glue solution is obtained. Now coat the leather with the warm gall nut extract, bring the glue solution on the roughened and warmed metal, lay the leather on it, press it firmly, and allow to dry in the air. The leather will adhere so firmly to the metal that it cannot be separated without tearing it.
Full Plans for Beautiful Modern Dwelling

We take much pleasure in presenting this month the complete set of architect's plans recently prepared for Mr. Louis Braunhold, the artist. They show a ten-room house remarkable for its harmony of exterior appearance and for the completeness and convenience of its interior. This dwelling is to be erected on a wooded site at Wilmette, Illinois.

The materials outside are, for the first story, rough boards stained brown and lapped eight inches to the weather; and for the second, gray cement plaster on wood lath, divided into panels in half-timber effect by rough boards stained brown. Brown shingles are used on the roof. All the exterior trim, including the cornice is painted white. The floor plans which have been prepared in a very complete manner show the size and arrangement of the rooms, position of lighting fixtures, etc. The very latest ideas along the line of modern conveniences have been embodied in this house. The living and sleeping porches and the third-floor studio rooms are special features. The detail sheets show some very interesting special finish.
Decorative Harmony in Building

Every housewife appreciates the advantages of decorative harmony in her home, and to procure this, in the upholstery as well as the woodwork, is a problem which is often very troublesome in the solution. Beautiful colors and combinations are admired, but very few appear to know the proper use of color. As a rule, the architect can suggest the proper coloring and shading, so that it will conform to the general surroundings; but as in all other things, experts do not always agree, because it is a matter of artistic taste rather than of mechanism. Experience gained in this line, however, has proved that certain effects will blend in harmony with certain colors, and, it is by reference to this experience that harmonious decoration is secured.

If the fittings and cabinet work of a room are of light oak, soft greens, blues, or deep reds may be used properly in the decoration, but never purple. With the medium dark oaks, dark greens, rich reds, and the lighter tones of blue will prove most acceptable to the eye. For an effect of metallic relief, old Italian bronze or gold will combine well.

Where light colored woods are used, ivory tints, grays, and old rose of modified color will harmonize, and silver or gold may be used in metal ornamentation. Empire green, ivory tints, and old rose are appropriate with rosewood, and rich gold, yellow, and bright reds.
combine well with ebony. White woods should have a combination of the light tints of ochre and blue or green, softened with raw umber. Delicate light blue shades, or pink and gold blend satisfactorily with enamel or ivory white finish. Walnut, being dark, requires the old blues and reds, with deep yellows, evolution of the cellar is an interesting study in the slow development of human intelligence. It was devised originally simply as a subterranean, frost-proof pit or cave, under the house, in which could be stored first wines and later apples, potatoes, cabbages and other perishable fruits, together with milk, butter and or gold, and with mahogany furniture deep olive greens or rich deep reds should be used, and the metal ornaments should be rich gold.

**From Cellar to Basement**

A warm, dry cellar is literally and actually the foundation of a warm, dry, well ventilated house. The cheese. Next it was utilized when the absurd insufficiency of stoves and fireplaces for heating purposes was recognized, as a convenient place to put the furnace. Then it was raised above the ground to make the furnace draw better, and lighted and ventilated, until now it has become one of the most important sections of the house from a sanitary point of view.
It should be cleaned, lighted, heated and ventilated, winter and summer, as carefully and scrupulously as any other part of the house. When this is done, we are rid at one stroke, of dampness, with all its well-known rheumatic, tuberculous and other disease-breeding tendencies; of bad smells from decaying vegetables, accumulations of dirt in dark corners, leakage of sewer and other pipes, which are now in plain sight instead of buried in the earth; of cold floors and all the injurious effects which come from dampness and moist decay all through the house.

The complaint that heating the cellar has spoiled its use for storage purposes is simply a proof of its advantages. Nothing could be more utterly unsanitary in this twentieth century than to permit vegetables, cheese, fruits and milk to be piled together in dark bins and adjoining compartments, nibbled at and raced over by rats, mice and cockroaches, imparting the odors of decay from cabbages and rotting apples to milk, cream and cheese and sending their combined aroma streaming constantly upward through the house.

**Porches for Sleeping in Colorado**

Sleeping out of doors has become an established custom in Colorado Springs, Colo. Nearly 40 per cent of the houses in that city have, in some form or other, one or more sleeping porches, a unique addition which has come as an outgrowth of this outdoor sleeping custom. It was in the days of overland travel on the old Santa Fé trail, that attention was first drawn to the advantage of sleeping in the open air.

It was noticed that members of the party who left the east in poor health began to pick up in health and spirits as the result of the outdoor life.

The sleeping porch originated in Colorado Springs more than twenty-five years ago, when pioneer physicians began advising patients to sleep out of doors. At first a cot was moved out on the porch every night, and beside it was erected a wind break. From this has been evolved the present day sleeping porch, equipped with electric lights and electric bed-warming pans, made comfortable with the best of furniture, easily accessible to the bath or dressing-room, and
fitted with roller curtains which may be adjusted after going to bed.

In the treatment of pulmonary diseases, for which Colorado has for years been a noted haven for sufferers, the practice of sleeping out of doors was first introduced, and it has been of inestimable value as a most important factor in effecting a cure. The practice is, however, no longer confined to the invalid, but, on the theory that it is as valuable in keeping well people in health as in making sick well, it has now been generally adopted by well people, many private residences being equipped with from one to four porches, where the entire family sleep in preference to their bed rooms.

It is admitted by all who sleep out of doors that they awake each morning more refreshed than when
SIDE ELEVATION

SHINGLES

CEMENT PLASTER

TINNED

SIDE ELEVATION

Cement plaster
they sleep indoor, even if their bed room windows are wide open, and that they are devoid of that languor which is the natural product of poorly ventilated sleeping rooms.

Plans for new houses in Colorado Springs, whether for five-room cottages or for costly mansions, seldom leave out provision for a sleeping porch.

**Gas as a Domestic Illuminant**

While electricity has permanently driven out gas as an illuminant from large commercial buildings, gas illumination still maintains its supremacy for domestic use. The reason for this division lies principally in the conditions of supply of the illumination produced. The holder being charged the highest retail price, which renders electric light very much more expensive than gas illumination.

Furthermore, gas at its present price, is coming into general use for cooking and heating, and its combined use for heat and light makes the householder the principal customer of the gas company, and therefore entitled to the most favorable rates. With the comparatively few light-sources required in the dwelling house the question of convenience is of correspondingly small amount. The recent improvements in the shape of inverted burners and more artistic accessories also have kept it fairly on a par with electric light in respect to appearance.

In quality of illumination, there is actually nothing to choose between the two. A perfectly white light is entirely unnecessary in the home; in fact, it is not uncommon to use tinted globes to give additional warmth and color.

Company inspection of gas piping in new buildings is an established feature of the gas business in this country, and as the men doing this work come in direct contact with architects and builders, they can be of great service towards the solution of the problem of better gas illumination.

Pat—An' what is a chafin'-dish?
Mike—Whisht! It's a fryin'-pan that's got into society.
DETAILS OF INTERIOR FINISH
Two Well-Planned Buildings

PERPECTIVE AND PLANS OF A VERY ATTRACTIVE, WELL-DESIGNED FOUR-ROOM SCHOOL BUILDING
AND OF A BAPTIST CHURCH

The school building shown herewith is a recent design by Geo. W. Ashby, architect. It is considered one of the best of his work along this line of small or medium-sized village schools. This building is designed in the Elizabethan style, a very pleasing yet striking use of stucco and exposed...
timber work having been used. The grouping of the windows carries out the idea of this style also. In a building of this kind all the pupils are certain to have plenty of light and air. The arrangement of the rooms assures an easy-running school with no congestion nor crowding.

The exterior material of this building is brick, both for walls and trimmings. Cement plaster on metal lath is used in the gables. The roof is slate.

The outside dimensions of the Baptist church building are 60 by 84 feet. The basement is 9 feet high, the foundation being of coursed stone, rock faced. The trimming stone is Indiana limestone, sawed and planed. The brick is rock face, dark buff, laid in red mortar. The roof is slate laid over asbestos roofing felt.

The main auditorium-room is 48 by 48 feet and has a ceiling 16 feet high at walls and arching up to a center height of 24 feet 6 inches. The basement includes a primary Sunday school room, two toilet-rooms, kitchen, cloak-rooms and heater-room. The heating system is steam. The plastering is white sand finish, which is the best for decorating. The entire cost of this building, including pews, is to be $11,785. It was designed and is being built by J. B. Martin, at East Liverpool, Ohio.
The Revival of the Colonial

By J. M. Kane

A REVIVAL of the Colonial style of architecture has been very much in evidence of late years, both in new houses and in the remodeling of others. And justly so, for in beauty of design and outline these houses have no equal. Neither can any style of house surpass them for utility and convenience. They provide excellent light and air to each one of their rooms, which are usually of goodly dimensions.

Graceful and Dignified Colonial Front

Of all our homes there are none which appeal so strongly to us as the Colonial. They are purely American, having been developed in Colonial times from classic models; hence the name, Colonial. Most of them of any pretensions have a large central hall running through from front to rear, with a spacious stair leading up, either in one long flight, or with two or more landings; still others have windows at top and bottom.

Some of the more expensive Colonial homes have fireplaces of brick or cobblestone laid up as they come from the fields, or with broken faces. This latter way makes a most artistic finish, especially when such a fireplace is surmounted by a massive oak mantel and is flanked by seats on either side. When a fire of dry logs is burning it makes a most comfortable and inviting place to receive visitors, or for a family gathering on a cold winter's evening. Happy the man who has such a place to meet his friends and family and the wherewith to keep it up! Who would exchange it for a palace with all its false glitter and show?

Opening out of the central hall are usually a living-room, library and dining-room. Sometimes these rooms have beamed ceilings and the side walls of the dining rooms are paneled up to the wide plate rail. The interior finish throughout the room is done in dark oak or cypress, sometimes in mahogany. A most effective finish for such a room is white enamel.

Among the most important of the good points of the Colonial style is its solidity and freedom from the constant repairs, so much in evidence where the more flashy styles are built.

The illustrations are examples of the Colonial in one of our prosperous northern New York cities. Two have been remodeled, the originals having been large two-story square houses.

Example of Colonial Remodeling

It is admitted that no shop owner has a moral right to recklessly imperil the life and limb of employees. Neither has an employee a right to imperil himself through a spirit of recklessness or carelessness, yet many of them do. The question is, how are we to prevent it?
How to Make a Fireless Cooker

To the Editor: Chicago, Ill.

In your November issue Mr. Chas. E. Otto asks for information, how to build a fireless cooker.

First get your kettles, and I would suggest three enamelled ones 4, 6 and 8-quart respectively, with lids. Next make a box with a removable bottom. The box should be large enough so that when the kettles are set in it there will be at least two and a half inches between each kettle and also between the inside of the box and the kettles. Next cut a 7/8-inch board to exactly fit inside of the top of the box, cut three holes in this board 3/4 of an inch larger than the widest place on each kettle. Now have three galvanized-iron tanks made to exactly fit inside of each hole with a flat bottom. Make the tanks two inches deeper than the kettles; and fasten the board in the box flush with the top edge. Now turn the box upside down and unscrew the bottom, and pack the space around the tanks with excelsior. Fill it up so that the bottom will have to be forced on; be sure and pack very tight. Next turn the box over and fit on either one large lid for the whole top or three smaller ones, one for each kettle. Fix a clasp of some kind to lock them tight. Make three round cushions the size of the tanks and about two inches thick to put on top of the kettles and you have a fireless cooker complete. It would be well to put a 2 by 2-inch post in each corner of the box and let them extend below the bottom of the box about one inch and put on casters. You can make the box plain or fancy as desired.

Chas. V. Kelly.

To Develop the Hip for a Bell Roof

To the Editor: Rochester, N. H.

Please give in the next number of your magazine, a diagram and explanation of method for obtaining curve of the hip and common rafters for a bell-shaped roof for a square tower, similar to the sketch enclosed. Would like a rule that will apply to an octagon tower. Ernest S. Goodwin.

Answer: This question has been answered many times, even as late as the November number, where on page 233, in Joseph P. Batte's question of "How to Develop Corner Brackets," the question is fully answered, though applied to a curved bracket. It should be remembered that the shape of the curve makes no difference as the principle applies to all alike; but like many other framing problems there are different ways of illustrating the subject.

As this furnishes an exceptionally good study, and as there are many subscribers that have not had the advantage of back numbers, we will illustrate it again. However, in doing so, we cannot add anything to the article above referred to. But, as we have said before, there are different ways of solving the problem, it is simply a question of which way suits the individual taste best.

The accompanying illustration shows a very good way of arriving at the shape of the hip, as follows:

Lay off the desired shape of the common rafter full size, with run and rise, as shown in the illustration. Now, since the run of the hip for a square-cornered building must have a gain of 5/12 over that for the corresponding common rafter, it is just the same as taking hold of the foot of the common rafter and stretching it out that much. This would, of course, add to the length of the rafter, and in case of a curved rafter, it must be elongated to coincide with that of the common rafter. This may be done by laying off a number of lines parallel to the run, as shown in the illustration, and by measuring these lines, as from A to B, setting off 5/12 of their respective lengths to the left of the curve, as from B to C and check. After all of the lines have been thus measured, run an off-hand curve through the checks and the proper curve will be formed. In other words, if the line A B is 6 feet 7 inches long, add 5 inches for each foot and 5/12 inch for each inch for the fraction of the foot. Thus for 6 feet, it would be 5 times 6 equals 30 inches, and for the 7
inches it would be 3 times 7 equals 35/12 inches, or 2 11/12 inches; this added to 30 would be 32 11/12 inches, or the distance between B and C. Proceed in like manner for the other lines. The backing line is found by setting off 5/12 the thickness of the hip. From the curve on the parallel lines. Proceed in the same manner for the octagon hip, but in this the gain is only 1/12 over that of the common rafter, and the backing line is found by setting off 5/12 the thickness of the hip. A. W. Woos.

How Can the Acoustics Be Improved?
To the Editor:

Galt, Ont.

You are answering many interesting questions in the columns of the American Carpenter and Builder. Would be pleased if you could give me some information, how to deal with the following difficulty.

We built a large stone Sunday school hall last year. We are disappointed in the acoustic properties of the auditorium. We can't hear well what is said from the platform unless the distance between B and C. It is impossible to lay down any rules as to proportion, size or materials to be used in securing a perfect auditorium; in some instances the hardest reflecting surface may be necessary, such as smooth hard cement plaster, in others rough, soft, porous plaster. The steel ceiling may be essential, or a serious damage; it may want space back of it, or require felt backing. In some instances it may be necessary to construct ceiling and walls in panels of wood, those most remote being thinner and of the more easily excited surfaces. The shape of the ceiling or rear wall may be such as to reflect the sound directly back to the phonic center. This is a most disastrous fault, making speaking very difficult, the words coming from the speaker's mouth meeting the reflection of preceding words, making it almost impossible to distinguish them.

In a large misproportioned auditorium remedial measures such as sounding boards, stretched wires or heavy curtains may be warranted. These only tend to neutralize bad results and do not remedy defects, no rule can be given for the location, number or tension of the wires. This can only be determined by experiment.

Enron.

Good Advice for Foremen
To the Editor:

Omaha, Neb.

In answer to Mr. Worm in the November number I would say that I have had years of experience in handling men on the job and it is sometimes a difficult problem. It is more difficult to handle men to advantage on a small job than on a large job. To begin with don't set two men at work on things where only one man is needed to do the work, for it will be a waste of time. There are enough places where two men are needed. Then if your men are not all of he best, select the best for a leader and instruct him to take so and with him and go and do the part you want them to do. If it is heavy work it might be all right to have three men. For sheathing or siding one man by himself is best for the contractor's pocketbook.

It is not worth while to pay any attention to the grumbling of the men. Of course, they should be fairly treated and treated right, of course; but it sometimes happens that someone is jealous because he was not selected for foreman. If so let him pout it out; then maybe he'll feel better.

If the foreman does what is right he has nothing to fear from the contractor because of what some of the men may say. It is a very poor policy for men to be running to the contractor about the work. The contractor will generally select the one he thinks best suited for foreman and the rest should attend to their work without being meddlesome.

I. P. Hicks.

Top Cut of Truss Again
To the Editor:

DesMoines, Iowa.

I think Charles Gray's method of top cut of truss, as given in the October number will bear criticism, as it will plainly show up like the enclosed illustration and the steeper the brace the more pronounced the offset on the lower side will be. The true miter must necessarily be at the bisecting line of the angle or at the half way place between the two members and to get this, the same figures on the square will give the cut for both members; the thing that Mr. Gray's method will not do. Therefore, the rule that Mr. Gray refers to as being perpetuated by some authors of books, is about as near correct as the one he would have us adopt as the sure thing.

Billy Boy.
Construction for Small Ice House

To the Editor: South Bend, Ind.

We are planning to build an ice house for a Y. M. C. A. summer camp. We want to build it on the side of a hill and large enough for three months use. We figure that a house 14 by 16 and 10 or 12 feet high will be about right.

We are not sure about the construction of the house. The bank is quite steep and we wish to have the front at the bottom and the back cut into the hill as shown by enclosed sketch.

Will you kindly advise us if this is practical, and if the ice will keep well this way? If you have any suggestions we would be thankful to receive them.

Indiana Lumber and Manufacturing Company.

Answer: The concrete foundation should have a course of tiling around with cross tile connecting with the outside tile and all emptying into one outlet through the lower part of the front. Inside, the concrete wall should be filled with cinders to within one foot of the top. Or if the side hill is very steep so that the ice storage is to be largely within the excavated space and surrounded by the concrete wall, a layer of cinders ten inches thick should be laid down. Only coarse cinders with all ashes removed should be used. The upper foot of filling should be of white pine sawdust.

The upper walls rest on a double 2 by 8 foot sill and are made of two rows of 2 by 4 foot studs set 16 O. C. with a layer of building paper between them and also between the studs and the sheathing which is used both inside and outside. The outside should be then papered again and sided. The ceiling should be double boarded and papered; and paper should be laid between the roof boards and shingles. Care should be taken to make all joints in the paper as tight as possible.

The doors are to be fastened in front like refrigerator doors and are to be built like the sides of the house with air spaces and made to fit tight in the jambs. Doors and frames must be made of kiln-dried material. There is no floor and the ice rests directly on the sawdust filling.

A platform can be provided in the front of the door with steps leading up to same. A vent is provided on the roof to keep the air circulating in the attic.

Now He Feels Better

To the Editor: Exira, Iowa.

In the February American Carpenter and Builder, Mr. R. L. Ricks gave a problem called "A Sticker," and wanted a mathematical solution independent of the steel square. In the March number the problem was solved by arithmetic, algebra and trigonometry, the solution by arithmetic being given by myself.

In the August number there was an article by John Stillians called "He Doesn't Like Formulas," in which he asks, "Why is it that those who know how to do things won't or can't impart the information in a manner to inform?" and "Why can't they give it by plain arithmetic?" If Mr. Ricks had asked simply for an answer to his problem or an answer by use of the steel square, that would have been different; but he did not! He asked for a solution independent of the steel square and the answers were given that way.

As to the "plain arithmetic" and "manner to inform" part, what does Mr. Stillians call plain arithmetic, if this solution in the March number isn't plain arithmetic? I don't know how you would impart information in a "manner to inform" if a man who understands arithmetic at all doesn't understand this solution! Mr. Stillians also says "I did not see Mr. Ricks' request for the solution of this problem?"

Now, I believe, before giving my opinion as to whether the answer to a problem was correct or not or given in the right manner, I should want to see the problem.

As the answer was given as requested I feel it my duty to answer Mr. Stillians' article.

Since the American Carpenter and Builder is a genuine carpenter's paper I agree with Mr. Stillians and think that all answers to questions should be given in a practical carpenter's way, if possible, and not requested otherwise. All success to the American Carpenter and Builder!

L. A. Peterman.
How Cap Mold Should Go On

To the Editor:

I was a charter member of the American Carpenter and Builder family up till last spring when I allowed my subscription to expire on account of sickness. Now I wish at this time to ask for your decision in regard to a question which has come up here, as to the proper way to put on a certain cap mold. Most, if not all, the carpenters here put it on contrary to the way which I believe to be right; and while I am on the minority side I shall continue to maintain that I am on the right side.

Mill-work catalogs show the mold put on my way.

I enclose a sketch showing the two ways of using the mold. Will you kindly return this sketch and say which way is the proper one?

Charles C. Alger.

Answer: No. 1 shows the way this mold should be put on. The cyma recta curve is the "crown" of this molding and should be at the top.

Tightening a Belt

To the Editor:

I was bothered some time ago by a 6-inch belt that I was compelled to put in place where the pulleys were boxed or enclosed on both sides. There was no chance on either end to have the belt off while lacing. I took four pieces of 2 by 4 one foot long. Laid two together, as though it was a 4 by 4. Bored a three-quarter-inch hole between the two, at each end, an inch from the end. Did the same with the others. Two five-eighths-inch bolts with thread cut for a foot, bolts two foot long, made the pull-up arrangement. By putting one of these rigs on each end of the belt, and bolting together with half-inch bolts, two to each one, and then putting in the long bolts on each side, I was able to tighten the belt as tight as could possibly be desired. Bolts were loosened, and the rig saved for another time.

Marion P. Wheeler.

Why We Mail It Rolled

To the Editor:

Why do you roll up the AMERICAN CARPENTER AND BUILDER now instead of mailing them flat?

Able Ness.

Answer: Up to within the last year, we mailed the AMERICAN CARPENTER AND BUILDER in large envelopes; but after giving them a thorough trial, we found that they did not carry well through the mails. Frequent complaints were made that the magazine reached its destination marred by having the backs torn, loosened, etc. By rolling them in wrappers they are more easily handled, and at the same time are better protected, especially as to the corners, than with the loose envelopes.

Editor.
A Useful Demonstration

To the Editor: Hanford, Cal.
The following solves Geo. Sadler’s “Interesting Problem” of the November number:

Having a given polygon, circle, square or triangle and wishing to construct within the respective figure sets of similar figures, polygons, circles, squares or triangles proportionately decreasing, regularly, in any stated series, it will be found that the application of the fact that “areas of similar figures are to each other as the squares of their like sides,” enables one to so construct rapidly and accurately such figures.

In the illustration submitted, we have the given circle “A,” equilateral triangle “A,” regular hexagon “A,” and six isosceles triangles “A,” within which we have constructed three similar figures decreasing respectively by a magnitude of one-fourth the given figure, thus making the respective figures, including the given figure, of the magnitude of 4x, 3x, 2x and 1x, respectively.

It is not necessary to know the area of the respective given figures, for the “x” representing the magnitude cancels out when set in proportion couplets; thus in the couplet “4x is to 3x,” it will be same to say “a is to 3 as the square of the radius of the given figure is to the square of the radius of the figure to be constructed.” From this proportion we get for the radius of the first figure to be constructed the magnitude represented by the square root of 12. Proceeding, likewise, for obtaining second and third sought radii, we find them to be as shown in the margin of the diagram, the square root of 8 for the second sought radius, and the square root of 4 for the third sought; this being a perfect square its root is 2.

It may be remarked, right here, that where the radius of the given figure is an “expressible” number in magnitude, so will the fourth be an expressible number.

As to what figures are similar figures, let a word be said. All circles, all squares, all polygons of the same number of sides and of which the respective angles are equal in magnitude and all triangles having their respective angles equal in magnitude are respectively similar figures, in their respective classes and when compared in their classes come within the rule, which is: “Similar figures are to each other as the squares of their like sides.” This is the most useful proposition in geometrical mathematics.

C. W. Talbot.

Top Cut for Truss

To the Editor: Windber, Pa.
Brother Gray’s answer or explanation of the sketch he gives in the October number is all right, but I would refer him to my explanation of the same problem in the June number, which is practically the same thing; but there are several ways to get the same result or to bisect the angle. Here they are. Referring to Charles Gray’s sketch of a truss in the October number, take B C on blade and B E on tongue, tongue gives cut.

Again, take A B plus one-half of B E on blade, and one-half of B C on tongue, tongue gives cut.

Again, take A B plus A C on blade, and B C on tongue, tongue gives cut. So you see there are many ways to get the same results and all done with the steel square and pencil alone. I am a charter member and hope these few remarks will benefit at least some of my brothers in the trade.

John L. Breith.

Good Corner Post for Houses

To the Editor: Vancouver, B. C.
I am sending you a description of a really good corner post for frame houses, hoping same will prove itself useful to some of my brother carpenters. It consists of three 2 by 4 pieces, spiked firmly together, the center one standing out 1 ½ inches past the two outer ones. The figure shows the eleva-

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John L. Breith.
What Is the Hand of a Door?
To the Editor: Crookston, Minn.
Will you please state through the columns of the American Carpenter and Builder, with diagram, showing right and left hand doors, also right and left hand locks. Enclosed find sketch showing my idea of the question. AILE NESS.
Answer: The above furnishes a question that is not at all clear, because a door that seems most convenient to use the left hand from one side, changes to the right from the other. We find this explanation along with an illustration, in one of the leading hardware catalogs, as follows:
"The hand of a door is determined from the outside of a building, room, or closet." Now it seems that in their effort to make the subject clear, they have made hard work of it by adding the last clause, because the same lock will answer in either way—which is the main object sought. Then again, take a partition door between equally important rooms, how can it be "determined from the outside of the building."
A more simple way would be to reckon from the jamb side of the door; then it will always come right. The accompanying diagram is as per Mr. Ness' sketch and his version of it is correct. The locks are of course reckoned same as the door. EDITOR.

A Clear Explanation
To the Editor: Glen Easton, W. Va.
I have been much interested in the "handspike" problem so recently discussed in the American Carpenter and Builder. I will send you a solution which I hope will be easily understood.
Wherever the supports upon which the sill- rests are located, the products of the weights upon those supports, when multiplied by their respective distances from the center, will be equal. Now the sill in the problem is 39 feet long. Suppose it weighs 12 pounds per foot. Then weight of sill will be 360 pounds. The man at the end is to carry 120 pounds, his distance from center is 15 feet. 120 times 15 equals 1800. The weight on the handspike is 240 pounds. Then distance of handspike from center would be found by dividing 1800 by 240 which will give 7 1/2 feet, which also makes it 7 1/2 feet from end of sill. By this method, the location of the handspike can be found for any amount that it might be intended for to carry.
I was much interested in Mr. Talbot's solution which is correct. I hope Mr. Schneider may be able to see through this method. M. W. CROUCH.

Well Finished Barn
To the Editor: Highland, Mich.
Here is the picture of a barn that I finished June 30th this year. It is said to be the best finished barn in this vicinity. The picture gives a very good idea of how it looks. It has a fine 8'4"-foot basement, opening to the south, with one horse stable door to east and one to south. The west end of the basement is finished for sheep, while through the center are stalls and stanchions for cows and young cattle, with alleys between. The barn is 36 by 60 feet with 14-foot drive floor. In the east end is a 20-foot bay. Across the south side of west end is a granary 12 by 20 feet, containing five large bins and alley leading to an outside door on west end of barn, where there is a platform from which grain can be loaded directly on wagons. The rest of the west end is floored over even with top of granary, under which is a place for storing farm tools.
There are a few barns here that have the sweep at the eaves, and are objectionable on account of snow lodging in the depression and remaining on the north side of the roof, thawing a little every day and keeping the roof soaked, sometimes for weeks. Others have only a fascia at the eaves, with plain box cornice on the ends. This makes a fine place for...
birds to build nests under the eaves.

The owners of this barn wanted something that would not leave a place for either snow or birds to lodge. I devised the cornice illustrated by the drawings, which I think are self-explanatory. The fascia is 5 inches, plancher 6 inches and frieze 8 inches in eaves cornice. This makes an inexpensive cornice and gives a barn a well-finished appearance. The pitch of outside roofs is 18 inches rise to one foot run, covering 15 feet, while the pitch of top roof is 7 1/2 inches rise to one foot run, covering 21 feet of barn. The dormer is 24 inch rise to 7 foot run and is 11 feet 4 inches wide on plate. The frame is heavy timbers throughout, mostly oak, and has purlin plates well braced with 6-foot run and 3-foot drop braces, which greatly stiffen a barn endwise.

ALBERT GONNE.

Rafter Cuts for Hip Roof

To the Editor: Detroit, Mich.

As there are so many inquiries regarding the cuts for the hip rafter, I submit a solution to the problem, which, if you think worthy of notice, I should like to see published in the AMERICAN CARPENTER AND BUILDER.

I purchase your journal each month at the news stand, and its contents are very interesting and highly instructive to me, especially the correspondence columns.

It is very easy to give a set of figures for making the several cuts for the hip roof; but in order to understand thoroughly such and such figures, taken on the square, will make all the required cuts it is necessary to analyze the different parts of the given roof and be able to see what position and relation each member bears to all the other members. For that purpose, I offer three diagrams, showing how the cuts for any hip rafter may be obtained.

For the purpose of illustration we will take the problem of cutting a hip rafter for an "L" roof having two different pitches, one side having a run of 9 feet, the other a run of 12 feet; both having a rise of 9 feet.

Many framers will tell you that the length of common rafter and tangent will make the top cross cut for the hip rafter. This is only true after the hip rafter has been "backed." Before the hip has been "backed" it forms a plane of its own and conforms to the slope of neither roof.

Fig. 1 exhibits a portion of the plan and is self-explanatory.

Fig. 2 is a sort of perspective view of the top end of the hip rafter, notched around the ridge pieces, and shows the relation of the different lines. The notched end instead of a pointed end is used in the sketch the better to study the relations. However, either cut may be made by using the figures which will be given later. The full lines a-b and c-d are the top edges of the rafter before being "backed," and b-e-d the notch cut to fit around the ridges. The dotted lines, b-l, j-e, k-l, would be the top edges after the hip is "backed." By a close observation it will be noticed that the dotted line m-n, being square across the rafter, must necessarily be level, and the lines i-e-l, being on the edge of the ridge, must also be level. If the rafter be cut on the lines i-m-n-l the cut would be a level cut and the lines e-n and n-l would be in proportion to the two "runs" of the roof, viz. 12 and 9. The line n-d is a length of the hip which would set over a run of 9. The line l-d is a rise of the hip corresponding to the run of 9.

The lines e-m and m-i, on the other side of the hip, are also in proportion to the two runs, but in inverse order. The line m-b is a length of the hip which would set over a rise of 12, and i-b is its corresponding rise. It will be seen that the figures 10.5 (on the line n-d) and 12 (on the back of the rafter) will make the cut for the part of the notch on the "B" side of the roof, and the figures 14 (on the line m-b) and 9 (on the back of the rafter) will make the cut for the other side. If the rafter is to be cut pointed to set between two common rafters, instead of being notched, simply reverse the order of the figures.
The lines e-n and n-o are in proportion to the figures required to make the necessary bevel for "backing" the hip on this side. The line n-o is equal to p-l, which is a line normal to the hip at a run of 9, which is the run of the opposite roof A," or the tangent of the roof of "B." (On a hip roof over a square plan, the run of one roof is equal to the tangent of the other roof.) From this it will be seen that the figures necessary to "back" the hip on a certain side are the "run" of that side and a normal to the hips at a run equal to the tangent. These figures are simply proportional and for actual use must be diminished. If we have a rafter 2 inches wide on the back, one-half is 1 inch, and the figures 12 and 4.63 in Fig. 2 are in proportion as 1 is to .39. (.39 is ¾ nearly.) Then 1 inch on the back and ¾ inch down the side makes the "backing" for the slope "B." Fig. 2 is simply for the purpose of analysis, and after the relationship of the several parts is thoroughly understood is of no further use.

Fig. 3 gives all the lines and figures necessary to make all the cuts for hip roof given in the example, and by substituting the proper figures will cut any hip roof over a square plan. It may also be used for an oblique plan by imagining the opposite roof to have a run equal to the tangent of the side on which you are working.

On the same level line, set up the run, rise and pitch of both common rafters and the hip rafter. Draw normal lines from the hip to the intersection of the run and rise of each common rafter. Also draw lines square from the top end of each common rafter to the plate line, to represent their respective co-pitches. Mark the length on each line.

While a knowledge of square root would be a great help in determining the lengths of the several lines; still it is not strictly necessary. A careful use of the square and a sharp-pointed knife will give sufficiently accurate results. The figures in the diagram are left abstract for the purpose of using the opposite roof to have a run equal to the tangent of the side on which you are working.

The following schedules of figures, taken from Fig. 3, give all the cuts for a hip roof.

**SCHEDULE OF CUTS FOR "A" SIDE OF ROOF**

**Common Rafter**: Side cuts (run and rise), 9 by 9.
- Hip Rafter: Side cuts (diagonal and rise), 15 by 9; pointed top (9/15 length and tangent "A"), 10.5 by 12 (mark by 10.5); notched top (12/15 length and tangent "B"), 14 by 9 (mark by 14); backing (run and normal "B"), 9 by 6.17.
- Jack Rafters: Side cuts (run and rise), 9 by 9; top cuts (pitch and tangent), 12.73 by 12 (mark by 12.73).
- Sheathing and Plancher: Face cuts (pitch and tangent), 12.73 by 12 (mark by 12).
- Facia (square with rafter): Face cuts (co-pitch and co-pitch tangent), 12.73 by 12 (mark by 12).

**SCHEDULE OF CUTS FOR "B" SIDE OF ROOF**

**Common Rafter**: Side cuts (run and rise), 12 by 9.
- Hip Rafter: Side cuts (diagonal and rise), 15 by 9; pointed top (12/15 length and tangent "B"), 14 by 9 (mark by 14); notched top (9/15 length and tangent "A"), 10.5 by 12 (mark by 10.5); backing (run and normal "A"), 12 by 4.63.
- Jack Rafters: Side cuts (run and rise), 12 by 9; top cuts (pitch and tangent), 12.73 by 12 (mark by 12).
- Sheathing and Plancher: Face cuts (pitch and tangent), 12.73 by 12 (mark by 12); edge cuts (co-pitch and co-pitch tangent), 12.73 by 12 (mark by 12).

**SCHEDULE OF CUTS FOR "C" SIDE OF ROOF**

**Common Rafter**: Side cuts (run and rise), 12 by 9.
- Hip Rafter: Side cuts (diagonal and rise), 15 by 9; pointed top (12/15 length and tangent "C"), 14 by 9 (mark by 14); notched top (9/15 length and tangent "A"), 10.5 by 12 (mark by 10.5); backing (run and normal "A"), 12 by 4.63.
- Jack Rafters: Side cuts (run and rise), 12 by 9; top cuts (pitch and tangent), 12.73 by 12 (mark by 12).
- Sheathing and Plancher: Face cuts (pitch and tangent), 12.73 by 12 (mark by 12); edge cuts (co-pitch and co-pitch tangent), 12.73 by 12 (mark by 12).

Note: This roof being of square pitch, the tangent and "co-pitch tangent" are equal.

To the Editor: Cleveland, Ohio.

Enclosed you will find detail of how I make sills on doors, which I think will not only preserve the veneer on the lock-rails, but will in the end save money.

You will notice the sill going through the thickness of the door, which will by no means let water down into the veneers. Notice also the extra molding below the sill. This not only makes a good substantial stool, but a very neat one.

I had face cuts trouble with the veneer coming off the lock rail by water from the glass going into the veneer, that I had to look for some remedy; so I hit upon this method and since then have no more trouble.

Jos. P. BATTES.
Typical City House

To the Editor:

The accompanying photo shows a brick and stone residence which I designed for Mr. Howard Prescott. It is located on Rhodes avenue, Chicago. It is what might be termed a typical city house. It is simple and neat and is planned with no waste space; contains eight large rooms, well lighted. This building, constructed with all modern improvements, hardwood trim, bronzed hardware and electric light fixtures, cost $3,300.

John Irvine Dorr.

Wisdom of Solomon

To the Editor:

Referring to the discussion of the "hand-spike" proposition, and the contributions of Gentleman Stillians, Talbot, Weatherby, Schneider and others, in your numbers of August, September, October and November:

First of all, permit me to commend the reading of this valuable magazine to every carpenter and builder in the land. We all gain valuable information in the great latitude of discussion of the interesting variety of mechanical questions permeating these pages. We are interested much by learning from others, and enormously in discovering their errors.

The "hand-spike" discussion reminds me of the dispute between A and B, as to whether a tub of water would weigh more with a fish in it. They agreed to leave it to the king, who at once commanded, "A, bring me a tub of water and a fish." "B, bring me a set of balance scales." To A and B he commanded, "Weigh the tub of water without the fish, and then weigh it with the fish." They then turned toward the king to hear his decision, who expelled them without further ceremony, saying, "You fools, you have answered the question yourselves." If Stillman and Schneider are in any doubt about where the hand-spike should be placed, why do they not go into some hardware store, pick out a gas pipe, measure its length, weigh it, measure off one-fourth its length from one end, rest it on the scales at this pivotal point, with the other end supported by the finger, and discover whether or not this weight is two-thirds the whole weight of the pipe? If they will do this they will recede from their contentions without further invitation from Talbot. Mr. Schneider's statement in the November number, "The man at the end will carry as many feet as the hand-spike is placed from the center," is erroneous, and is the common error very many have fallen into along the same line of reasoning. He utterly disregards the "rule of the lever," so familiarly known since the days of Archimedes, viz.: The distance from the fulcrum to the power, is to the distance from the fulcrum to the weight as the weight is to the power.

These men should pay more attention to the well-known law that the distance from the weight (center of the stick) one is lifting, determines the power he has over the weight.

As an author always sees more in his works than the average reader, so does Mr. Talbot see more in his ingenious draft in the November number than I do. Suppose two men at the end and five at the lever, then what about the draft? Here is a rule that Gentlemen Schneider and Weatherby may apply, however many men, and howsoever distributed at the handspike and at the end:

"The weight of the stick in the center must be, For there on a lever t'will balance, you see; The man at the end, to make the thing just, Is just twice as far from the weight as the rest." If five men at the lever and one at the end, then, "The man at the end, to make the thing just, is five times as far from the weight as the rest," etc. If seven men at the lever and three at the end, then, "The three at the end, to make the thing just, are seven-thirds as far from the weight as the rest."

Rule: Multiply one-half the length of the timber by the number of men at the end, and divide by the number of men at the handspike. The result is the distance the handspike must be placed from the center.

Here is a proposition involving the same law of mechanics:

A log of uniform density, 24 inches in diameter at one end, 36 inches in diameter at the other, 40 feet long, will balance horizontally, at some pivotal point. Determine this balancing point.

S. F. Kennedy.

Classes of Levers

To the Editor:

If you will allow the handspike question any more space in your paper I would like to offer an explanation of the principles involved and to give a simple rule for its solution. Mr. Talbot has given the correct answer and is right in using the principle of the lever in its solution, but he is in error as to class of lever.

Levers are of three classes, as follows:

If the fulcrum is between the weight and power, the lever is of the first class.

If the weight is between the fulcrum and power, the lever is of the second class.

If the power is between the fulcrum and weight, the lever is of the third class.

Now the steel-yards is a lever of the first-class, whereas, the timber carried by three men and a hand-spike is a lever of the second class, with the fulcrum at end carried by one man, the weight at middle or balancing point of timber, and the power at hand-spike.

By applying the law of moment (weight multiplied by distance) we will have:

The power or weight at hand-spike multiplied by its distance from fulcrum must equal weight of timber at middle, or balancing point, multiplied by its distance from fulcrum. Therefore the product of the weight of timber and distance from center to fulcrum, divided by weight hand-spike is to carry will give the distance handspike should be placed from fulcrum at rear end.

I hope this will help clear up the hand-spike sticker. It has been an entertaining as well as instructive problem, and I am sure many of us readers have been benefited by it.

T. C. McCoy.
"Ideal" Hardwood Floor Scraper

Among the many important labor-saving devices manufactured during the past few years, is a machine for scraping hardwood floors manufactured by T. L. Phillips, Aurora, Ill. This is the "Ideal" hardwood floor scraper.

There is no branch of the carpenter trade so laborious as scraping floors by hand.

The "Ideal" has several important features which make it a superior article in its line. It is a high-grade machine in every respect.

The efficiency of a floor scraper depends greatly upon the firmness of the machine. The "Ideal" has much firmness and rigidity, does its work fast and eliminates the wavy appearance to the finished floor.

The "Ideal" will successfully scrape every square inch of floor in a room and will not mar the finished trim.

The "Ideal" is equipped with the best rubber tires. The blades are of the best material for the purpose. A slight turn of one bolt firmly clamps the blade in place.

The four blades furnished with the "Ideal" have much extra real wearing surface. This because the blades have no slots or holes in them.

The blades can easily be sharpened without removing from the clamp.

The "Ideal" can be used as a sander.

The "Ideal" is extremely simple in construction as well as in its operation. It is impossible to get it out of repair by use.

No contractor and builder can afford to be without an "Ideal" floor scraper.

Try one and be convinced. For full information and prices address T. L. Phillips, Aurora, Ill., U. S. A.

New Bevel Protractor

The L. S. Starrett Company, Athol, Mass., U. S. A., have added a new line of bevel protractors to their already large list of accurate tools and gauges. Their bevel protractor, No. 490, which is equipped with hardened blade and reversible head, is illustrated herewith.

This tool is of the same general design as their No. 12 pro-
Sackett Plaster Board

FIRE PROOFING

Instead of Lath

Time Saving

Labor Saving

Money Saving

The board that made plaster boards famous

First used in 1891 Perfected in 1908

Sackett Plaster Board Company

17 Battery Place
NEW YORK

DOES NOT STAIN OR BUCKLE
tractors will be sent with blades of No. 4 graduation, unless both sides of the blade. This greatly improves the usefulness of the tool, as the same angles may be transferred from either side of the blade without re-setting. Another improvement is that the turret is graduated to read both ways from 0 to 180 degrees. Mechanics will clearly appreciate this point, as direct readings may be had from the turret, indicating the supplement of the angle, as well as the angle required. The fact that there is but one zero line on the frame eliminates all possible chance of confusion as to whether acute or obtuse angles are obtained.

The head of this protractor is 7 inches long and is supplied with an accurate level attached to one side as shown by cut. The blades are hardened and graduated with heavy figures reading both ways. The heads are made with fine smooth finish to match the finish of their No. 33 combination squares. The heads will, however, also fit the blades of the No. 11 and No. 23 combination squares and combination sets. These protractors will be sent with blades of No. 4 graduation, unless otherwise ordered.

Diehl’s Screen Door Catch

We are again calling your attention to Diehl’s screen door catch No. 51. Cut No. 7 shows the catch in position on door. The catch is placed on the jam of the door, always right side up on either side of the door, whether right or left. Place the angle iron on door so that the loop will engage in the forks of the catch.

Cut No. 2 shows the inside construction of the catch. This is the only catch made that has a double leverage, so that the spring always pulls across the corner and still has a direct leverage on each arm. This spring will never lose its tension as it does not expand over one-eighth of an inch and is enclosed in a solid steel casing.

These goods are manufactured by Diehl Novelty Company, Sheboygan, Wis.

The Never Fail Stropper

In all probability many readers of AMERICAN CARPENTER AND BUILDER have experienced the troubles of the man in the picture. You have doubtless reasoned, as he seems to be doing, that if you couldn’t cut one hair with your razor, how the devil were you going to cut a face full. An agony of torture has usually resulted every time you have attempted to shave yourself. So, with muttered imprecations, you have given yourself over to the mercies of the suave barber.

The Never Fail Company, Toledo, Ohio, claim that they have completely changed this situation, and that no man need longer dread the operation of shaving himself. They have an automatic stropper that will put a hair splitting edge on the dullest razor in four to six seconds. The stropper is made in two styles, one for the old-style razor and the other for any style safety. Both are models of simplicity and work with precision and ease. No fussy parts to get out of order. It is reported that $15,000 has been spent by the Never Fail people in perfecting this stropper, and they appear to be so confident of its making good that they make an exceptional fifteen-day trial offer to all readers of this paper. It is so manifestly fair and above board that we believe our readers would make no mistake in accepting it. Complete details are to be found in their advertisement.

Thirty-one Miles of Pioneer Roofing

The Pioneer Roll Paper Company, manufacturers of ready roofings, roof paint and insulating papers—whose factories are located in Los Angeles—recently received an order from the Associated Supply Company, of San Francisco, for 400,000 square feet (31 miles) of 32-inch roofing—to be used in covering their large oil reservoirs in Kern county. The size of this order, and the source from which it came, is certainly a strong endorsement of the quality of Pioneer roofing.

We are advised that the Pioneer Roll Paper Company will be glad to send their 32-page illustrated booklet on roofs and roofings to anyone who will write for it, mentioning this publication.

Prize for Investigations of Concrete

The award of the Miracle Thesis prizes for the competition of 1908-1909 has just been made. Mr. O. U. Miracle, of the Miracle Pressed Stone Company, Minneapolis, Minn., a former Ames student, provides, annually, a sum of money to be awarded in three prizes for investigations helpful to the concrete industry.

Five Theses, representing the work of nine men, were presented in competition for these prizes. Mr. Go. P. Deickmann, chief chemist of the Northwestern States Portland Cement Company, at Mason City, Iowa, Mr. L. L. Bingham, a prominent cement pipe, block and sidewalk manufacturer at Estherville, Iowa, and professor I. A. Williams who has charge of the cement and clay work instruction at the Iowa State College at Ames, were the judges.

The first prize of $50 was awarded to Messrs. R. R. Strother of Hubbard, Iowa, and Platt Wilson of Montezuma, (Continued on page 394)
$1

AND THE COUPON WILL BRING THIS THREE DOLLAR NEVER FAIL STROPPER

Handy Lamp—Gasoline Lighting System
A Shadowless 300 Candle Power Light

that can be turned UP OR DOWN instantly same as gas, or can be left burning day and night at a dim light of one candle power or less at almost no expense and can be turned up instantly to a dazzling bright 300 candle power light that will flood a 30-ft. room with light as bright as day at less than one-third cent an hour and save five times its cost in a year, over kerosene, gas or electricity. One gallon of gasoline will last 40 to 50 hours. They are simple and safe; any one can handle them; can be used anywhere, in home, store, church, or wherever good light is needed. Write at once for A. C. B. catalog and particulars.

Brilliant Gas Lamp Company
Department 20, 42 State Street
CHICAGO, U. S. A.

$1 TRY THE NEVER FAIL 15 DAYS

Then, if you can’t say with perfect truth, “Never have I enjoyed such soothing shaves,” send it right back at our expense and we’ll return your money.

With the Never Fail every user is at once an expert. You can instantly sharpen any razor—any style blade—and make it better than the day it passed the shop inspector. Better, keener, sharper than it can be made by the most expert hand operator, and in much less time. Only a few strokes on either side does the trick—five or six seconds. If you use safety blades, the NEVER FAIL WILL MAKE EVERY ONE OF THEM GOOD FOR FROM 50 TO 150 PERFECT SHAVES, so it will pay for itself in money as well as time saved.

We are so positive the Never Fail will make good, that we issue the exceptional offer contained in the center of this advertisement. We want you to enjoy a Never Fail like thousands of others. We want you to know, by experience, the pleasure of a smooth, soothing, comfortable shave—a shave only possible with a Never Fail Stropper.

Remit only a third of the price—and that simply as an evidence of good faith. Could we choose our inquirers we’d gladly send it free. Days. Subject it to the severest tests. Then, if not completely satisfied—if not the best stropper you ever used—if it doesn’t do just as we say, send for your money.

There never was a shaving problem—it has always been a sharpening problem. Any man can use a razor, provided his blades are properly sharpened.

We could tell you much about the way the Never Fail is made, but you don’t care to hear it. You only want to be certain that your shaving troubles are ended. We have it in the Never Fail. One dollar and the coupon will prove it, and your dollar is simply on deposit while you judge.

Don’t go on shaving the old way—the torturing way. Waste time and money and undergo the risks of the barber shop. Shave every day in your own home at the same time, and complete the rest of your morning toilet. Carry the clean, well-groomed face to business that every gentleman should. You’ll feel better, look better and be time and money ahead. Just clip the coupon, pin a dollar bill to it and mail at our risk.

NEVER FAIL COMPANY
1072 Nicholas Building TOLEDO, OHIO
More than likely, you've heard a great deal about Johnson Materials for finishing and refinishing wood. Now, we ask you to get better acquainted with these preparations—by trying the samples which we will send you free. Mail back the coupon—right now—and we will send you post-paid samples of all three of these Johnson preparations:

**Johnson's Wood Dye**
For the artistic coloring of all wood. It is a deep-seated stain and a proper finish must be applied over it. Johnson's Wood Dye is made in fourteen shades as follows:
- No. 126 Light Oak
- No. 123 Dark Oak
- No. 125 Mission Oak
- No. 140 Manila Oak
- No. 110 Bog Oak
- No. 121 Moss Green
- No. 122 Forest Green
- No. 128 Light Mahogany
- No. 129 Dark Mahogany
- No. 130 Weathered Oak
- No. 131 Brown Weather'd Oak
- No. 132 Green Weather'd Oak
- No. 172 Flemish Oak
- No. 178 Brown Flemish Oak

Johnson's Plasto-Filler
This preparation comes in powdered form. Mix with water and it is ready for use. Better and cheaper than any paste crack fillers on the market.

Johnson's Under-Lac
Is better than shellac or varnish, and may be used wherever either of these preparations may be used. It dries in a half-hour.

S. C. JOHNSON & SONS
The Wood-Finishing Authorities
RACINE, WISCONSIN
Working Samples Of Johnson's Finishes Sent To You Free, Postpaid

Fill out the Coupon and mail to us today and we will send you working samples of Johnson's Plasto-Filler, Johnson's Under-Lac and Johnson's Wood-Dye in any shade you select. (See list of shades on opposite page.)

With the samples we will send you our illustrated guide book containing complete color card and full directions for finishing and refinishing wood. You need this book—and you need the samples. We'll send both immediately upon receipt of the Coupon.

Partial List of Jobbers of Johnson's Wood Finishes

Kohler-McLister & Co., Denver, Colo.
The Knight & Wall Co., Tampa, Fla.
Chas. Moer Co., Cincinnati, Ohio.
Walker & Gibson, Albany, N.Y.
H. M. Hooper Co., 118 W. Washington Street, Chicago, Ill.
Cleveland Window Glass & Door Co., Cleveland, Ohio.
Bennett Glass & Paint Co., Salt Lake City, Utah.
Western Paint, Oil & Glass Co., Lincoln, Neb.
Indley & Held, 2264 3rd Ave., New York, N.Y.
Pittsburg Plate Glass Co., New York, N.Y.
Barnes & Nuss, Grand Forks, N.D.
Fred Hummert, San Antonio, Texas.
C. W. Keenan, Brooklyn, N. Y.
Campbell Glass & Paint Company, Kansas City, Missouri.
David Bernhardt Paint Company, New Orleans, Louisiana.
Westcott, Slade & Balcom, Providence, Rhode Island.
H. M. Hodges & Brothers, New Haven, Connecticut.
United Sash & Door Company, Wichita, Kansas.
Fred's Neeseman & Co., Baltimore, Md.
W. P. Fuller & Co., San Francisco.
Los Angeles, Sacramento, Stockton, Oakland, San Diego, Cal., Portland, Ore.
Spokane, Tacoma, Seattle, Wash.

Why We Make This Offer

We have learned this: The quickest way to convince the Wood Finisher of the superior qualities of the Johnson preparations is to furnish him with samples so he can see for himself that we do not exaggerate the excellence of our products. And so we ask you to send for these samples and make your own tests. You'll never go back to putty or plaster of paris for filling cracks after you have tried Plasto-Filler. After a test of its quality, you will use Under-Lac in place of varnish or shellac.

And just as surely, no ordinary stains will satisfy you once you see for yourself how perfectly Johnson's Wood Dye brings out the natural beauty of the wood.

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
Iowa, for an investigation of the proper proportions for mortar and concrete.

The second prize of $30 was awarded to Messrs. O. L. Huffman of Wyoming, Iowa, and E. S. Fowler of Radcliffe, Iowa, for an investigation of the effect of clay and reground cement on the permeability of concrete and cement mortars.

The third prize of $20 was awarded to Mr. Royce Heath of Ames, Iowa, for an investigation of patent compounds for waterproofing concrete.

All the investigations were considered by the judges to have brought out points of importance to the concrete industry, and they will be published shortly in a bulletin of the Engineering Experiment Station at Ames, copies of which can be obtained free by writing to A. Marston, Ames, Iowa.

Cement Sewer Pipe Used

The Denver Republican for September 3rd, states that in letting the contract for all the work on the West Denver storm sewer to Gaffy and Keefe the board of public works took an important step. The contract price is $66,900. This is not so big but the contractors will use concrete pipe. This is considered the important point at city hall—the use of concrete in sewer work giving what the charter calls for in public work, namely, competition. Vitrified brick pipe has been used here tofore, and while it has served the purpose well, the price has been considered high on account of lack of competition. With the cement companies bidding on this class of work the taxpayers will get the benefit. The battle will end in the survival of the fittest, and in the meantime there will be a reduction in prices all around.

In the contract which is about to be awarded for the West Denver sewer a 24-inch concrete pipe laid in the ditch will cost $1.03 a foot. Under the old order vitrified pipe of this size cost $1.37 a foot. A 21-inch concrete pipe costs 87½ cents in the ditch, whereas a vitrified brick pipe cost $1.10 on the bank.

It is but fair to state that with smaller pipe the vitrified pipe makers have the best of it, as the cement companies cannot make concrete pipe of small dimensions much cheaper than those of larger size; nevertheless the large-sized pipe is used to a much greater extent than the small sizes in public work.

The mayor and board of public works have had this question of concrete versus vitrified clay under discussion all summer and spring. The vitrified brick people have made a hard fight against the introduction of concrete, and they started agitations against its use in certain parts of the city. For a time they succeeded. Some small contracts let earlier in the year in which the contractor was expected to use concrete were finished with the old material by “arrangement” with the contractor and manufacturer, but in the West Denver job, concrete will be used.

Experiments in other cities with concrete pipe have been successful. It is cheaper and is said to be as durable as the vitrified clay pipe. And for a number of reasons its use means something of a revolution in the contracting world.

In this connection it is of interest to note that the Miracle Pressed Stone Company, of Minneapolis, are furnishing cement pipe molds and equipment to the value of $1500.00, which are to be used in making the cement sewer pipe for this contract.

No. 8 “Union” Combination Saw

In the accompany cut is shown the improved No. 8 “Union” combination saw machine manufactured by the Seneca Falls Manufacturing Company, 218 Water street, Seneca Falls,
Strongest Gripping Brace You Have Ever Had

The greatest improvement ever made in brace construction is the ball-bearing chuck.

It can be tightened with the bare hand to a firmer grip than you can get with a vise on any other brace.

It can be released so easily that the weakest wrist can do it.

The only brace made with this patented chuck is the

P. S. & W. SAMSON BRACE

Tenpenny nails held by this brace have been bored through solid oak. Five sixteenths-inch rods with one end in a vise, have been twisted to the breaking point.

Beside the wonderful ball-bearing chuck, the Samson has a steel clad head with dust-proof ball-bearings—not a cast iron head nor a flat plate, but a steel cap completely surrounding the head to the height of 1/8 of an inch.

The Ball-Bearing Chuck The Alligator Jaw is still another asset of the Samson Brace. It parallels itself to fit the shape of any drill shank. No matter how hard the shank is jammed in, the spring will not be broken.

The P. S. & W. Guarantee Tool is on every P. S. & W. Guaranteed Tool. It represents 90 years' experience and ability backed by the highest quality. Look for that trade mark on every tool you buy.

Sold by all leading dealers.

The Peck, Stow & Wilcox Co.
MANUFRS of the Largest Line of Mechanics' Hand Tools Offered by Any Maker
Established 1859—Five Large Factories
Address Correspondence to 22 Murray Street, N. Y. City

Write us for our Free Book-LET. Our 160 page Mechanics' Handy List contains many pages of valuable information, and a complete catalog of over 300 tools for Carpenters, Machinists, Electricians and Tinmiths. Sent free at your request.

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
Simonds Saws are the Best

The steel, and the teeth formed from the steel are vital things about a Hand Saw. All the cutting of a saw is done at the points of the teeth, therefore a saw should be made of material that will hold the tooth points. Simonds Saws are Made of Simonds Steel and as a result are superior to other saws. This high grade saw steel will hold a point through hard and continuous service. Buy Simonds Saws if you want the best. You will get the best steel, the best hanging saw, the best value for the money.

When you need saws of any kind let us know and we will send you a free copy of an interesting booklet, “Simonds Carpenter Guide,” also the name of Hardware Dealers near you handling our saws.

Gasoline Lighting

Every builder should investigate the merits of the “Hand Lamp” gasoline lighting system of the Brilliant Gas Lamp Company, Chicago, Ill. It is the absolutely satisfactory and thoroughly modern illumination for suburban or country homes. Their new A C B catalogue is now being sent to those interested. Address Department 29, 42 State street.

Notice to Carpenters and Builders

The prize ad. of the Diehl Novelty Company that has appeared in previous numbers of this paper will appear once more in this issue. All coupons should be filled out and sent in before January 14th, as the contest ends on January 1st. Carpenters and contractors, it would be worth your while to fill out these coupons and send them in, as the prizes that...
Fine Files for Fine Tooth Saws

Any old file won’t sharpen every old saw properly. This is especially true of fine tooth saws. Until lately it was almost impossible to get a file that was small enough to go to the bottom of the tooth and at the same time cut the side to the proper angle. Now almost every dealer carries a stock of

E. C. S.
KEEN KUTTER
Special Slim Taper Files

—the slimmest taper files made. They go right down to the bottom of the teeth on a fine tooth saw, cutting true and quickly. For any other fine work they are just as suitable.

Like other Keen Kutter tools they are designed and built especially for the work. The teeth are accurately cut by improved machinery on blanks of the best tool steel. Tempering is done by natural gas, which gives them unequalled hardness and toughness. The cutting surfaces are uniform, every tooth being of the same depth. This gives 100% cutting efficiency compared with the 65% of ordinary files.

Compared with the general run of files these slim taper files are very long-lived. Instances are numerous where one file had sharpened 15 or 20 saws, and in one case 35 saws had been sharpened with the same file.

To introduce our special slim taper file to carpenters who appreciate good tools, we will send two free samples on receipt of the attached coupon properly filled out.

If not at your dealer’s, write us.

"The Recollection of Quality Remains Long After the Price is Forgotten."
—E. C. SIMMONS.

SIMMONS HARDWARE COMPANY, Inc.
St. Louis and New York
U. S. A.
are being offered by the Diehl Novelty Company cannot be purchased at your local jewelers at this value.

To those that have been using their goods we would advise them not to let this opportunity go by, as it is a cinch that somebody is going to get something good for Christmas.

**Equipment for the Modern Home Laundry**

Nowadays housekeeping really is a business quite as exacting and difficult for the housewives as "money-grubbing" is for the men; and if there is one function more than another which electricity can be made to serve, it is that of making housekeeping simple and easy and economical.

The family washing by old-time methods is a great drudgery. Still, many housewives prefer to go through the ordeal once each week for the satisfaction they find in having it properly done. Another class of women would like to do this,
If you are a carpenter, contractor, builder, architect, draftsman or apprentice, this picture should mean a great deal to you. There was a time when the only knowledge you could get of your trade or profession was through the "hard knocks" of experience. In your father's day the young man who failed to get an education could not make up for it in later life — he could not spare the time from work to attend a school or college, so he had to get through life with only the training he could get through working on the job.

There isn't time enough in a man's life to learn all that he should know about building construction by actual work and so the average workman knows only that work which he is experienced in handling. All this is changed. The different trades in all branches have their libraries which teach in simple, clear language all that used to be hard to learn in the building construction field of work.

Radford's Cyclopaedia of Construction
Carpentry, Building, Architecture
fills a long-felt want. We offer you now in this announcement a good chance to purchase it on unusually liberal terms — terms under which we take all the risk — this big, massive twelve-volume, five-thousand page Cyclopaedia, embracing all the features of construction work from the framing of a simple barn or cottage clear through to the erection of mighty skyscrapers, bridges and mammoth public works of all kinds. Every problem is solved in a way that any one can understand, no higher mathematics and no school room theory anywhere. Practical instruction from start to finish, written by practical experts for practical men.

If there is anything about your trade that you don't know; anything on which you want to refresh your memory; if there is anything that you believe will help you to a bigger job, paying better money and giving you more agreeable kind of work, you will find this information in the Cyclopaedia.

That's why we say this is your chance for a new start in life — a chance for you to get ahead in your trade, backed by certain knowledge of how to do things.

Let this new start in life be your Christmas gift to yourself.
TWELVE GREAT BIG MASSIVE VOLUMES and One Extra Large Volume of over 300 actual plans of houses, barns, bungalows, flats and stores, banks, garages, churches, public buildings, cement houses, etc., drawn by foremost architects. Selected for their excellence, economy of design and popularity among the building classes. This Cyclopedia contains over 5000 pages, 3200 specially drawn illustrations, diagrams, charts, working drawings, besides.

Sent for only $1.00 — Less Than 1/4 Price
Examine Books at our Expense—Not Yours

All you have to do is to write your name and address plainly on the coupon on the last page of this circular. Pin a dollar bill to it and mail to us. When we receive this coupon we don't go through any red tape of looking you up, of making inquiries from your employer or friends, but simply trust you as a member of the building trade and send you the entire set of books immediately. We prepay all express charges and you do not cost you one penny for examination. When you get the books they are yours for five days to examine them just as leisurely and as carefully as you please. You have the privilege of calling in your family, your friends, your employer, your fellow workers to help you to make a decision. After you have had the chance to go through them page by page, if you should decide that you do not want to keep the books, all that you have to do is to drop us a postal telling us so. We will immediately send back to you the payment of $1.00 which you sent us with the order blank. We do this without any argument, without any red tape and without any haggling whatever. Furthermore, we will remove the set of books without cost to you at once. Therefore, you are nothing out on the deal, you have not spent a cent, you have lost nothing whatever.

FREE Christmas Premiums. On this limited Christmas offer we give you absolutely free a great big portfolio of over 300 plans of all kinds of buildings, houses, flat buildings, store building, banks, garages, barns, bungalows, etc. This book is big, is of immense benefit to any man in the building trade. We include with this offer a full year's subscription to that great big monthly periodical, the American Carpenter & Builder, containing the biggest and best magazine for the contractor, carpenter and builder. And even that is not all. You have the privilege of going through the big portfolio of plans and if there is a house design that you can see in any way to your own advantage, we will furnish you free without cost a complete set of blue printed working plans together with complete typewritten specifications.

You know as well as we do that these plans and specifications could not be purchased in any other way for less than $50.00 to $75.00.

Which Way A Forward or
Are you going backward?
"If I only had this set of books twenty or thirty years ago, they might have changed my whole life. The knowledge in the big CYCLOPEDIA would have enabled me to increase my earning power, to take on big work, paying big money, and possibly have helped me to make a fortune in the building business."

We have received in the last two weeks nearly a hundred letters like the above — letters that breathe regret in every line — letters that show how hard it is for the untrained man to really get ahead in life.

This is your chance to build for old age. Don’t you wait too Long.

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It is no longer necessary for the progressive dealer to buy roofing from a half dozen manufacturers to meet the requirements of his trade—you can secure from the Ford Line any style and price of roofing your trade demands.

The Ford Trade Mark on a roll of roofing signifies quality—dependability. Forty years of reputation stands behind it.

The man who comes into your store to buy roofing, can't walk out without leaving his order, if you handle the Ford Line—whether he calls for a roof to cover a hen-house, his barn, his factory, or his mansion, he will find a "Special" roof to meet his requirements.

The Ford Line provides roofs for every building purpose.
To appreciate this, you must see the samples.

Use the coupon and send it in today.

**Ford Manufacturing Co.**
2333 La Salle Street, CHICAGO

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Please send samples of and full information about Ford's Special Roofs.

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When writing advertisers please mention the American Carpenter and Builder
Success of Asbestos "Century" Shingles

Asbestos "Century" shingles owe their success with critical builders and architects to their qualities as an ideal roofing and sheathing.

The shingles, as most builders are aware, are composed of a concrete of cement and asbestos fibre, compacted and formed into slate-like sheets under tremendous hydraulic pressure. They are applied like any ordinary shingles or slates, being nailed to rough sheathing.

Asbestos "Century" shingles are absolutely weather-proof, dampness and freezing merely hastening the maturing of the concrete. Fire cannot burn them or break through them. They not only protect the roof from any outside flames, but confine any fire that may be started within the building.

Cast Iron Gutters Last

Easily put up. Once up, always up. Do not bend or break by pressure of ladder against them. Will stand greater weight of snow or accumulation of ice than any other gutter. Not affected by acid fumes that in some vicinities play hob with all other metal gutters. They are adaptable to any kind of building or type of construction. Cast with moulded face to form part of cornice, or rounded to serve as a hanging gutter. Used almost exclusively in England and all over Europe. Supplied in 6 foot lengths. Joints fitted ready to erect. No soldering required. Send at once for circular and prices.

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THE WINTHROP SOLID TAPERED ASPHALT SHINGLES

ARE OF A COOL, GRAY SLATE COLOR

And have all the Durability of Asphalt—the Fine Appearance of Slate and the Light Weight and Low Cost of Wood Shingles. Laid with regular Shingle Nails, the same as Wood Shingles. NEVER REQUIRE PAINTING.

Write for Free Booklet and SPECIAL INDUCEMENTS TO THOSE WHO APPLY FIRST ROOF IN EACH TOWN

Winthrop Asphalt Shingles are Fire-resisting, Weather-proof, Wind- and Sun-proof, and never Crack, Break or Fall Off.

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How to Increase Your Profits!!!

MR. CARPENTER:—

We make it possible and gladly assist you to almost double your profits on any job you take and better yet, increase your business each season.

Here's our proposition:—

Have your customer select from our Plan Book, any House or Barn design, then we will send and get our special price on all material, to which add your cost of labor and if you wish further profits you can make for yourself:

- The Architect's Fees,
- The Millwork Dealer's Profit,
- The Lumber Yard's Profit,
- The Hardware Dealer's Profit,

as all these profits can go to you, because we make no charge for architect's fees and take advantage of our Free Plan Offer, you to keep in your own pocket the profits of the Lumber Yard or the Mill Work Dealer or the Hardware Dealer.

How can we make such low prices? We do it by buying complete brand new stocks, at Sheriff's Sales, Receivers' Sales and Forced Manufacturers' Sales.

Here's an example of one of our many House Designs and our wonderfully low prices.

Price to you for all Lumber, Mill Work, Hardware, Building Material, Nails, Etc., for House Design No. 156

$685.00

Paint for entire job - - $14.94

Complete, Up-to-date Plumbing Outfit - - $92.50
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Special Features of House Design No. 156.

This is the two story Bungalow pattern with veneer cement on the outside. A modern method of construction that is up to date, and thoroughly practical.

Size of this house is 244 ft. wide by 30 ft. deep, not including the massive porch across the front which with the heavy dormer in the roof, gives this house a very substantial and lasting appearance.

Interior of the house makes it possible for many artistic arrangements, while extreme simplicity is the crowning feature of the design.

This house has seven rooms, hall, pantry, bath room and four closets. It is well lighted, ventilated and communication between rooms is most conveniently arranged. Stairway is of modern design and construction and easy of ascent.

Our price of $685.00 is for strictly brand new stock and of such quality as will meet the most exacting demands of any critical owner.

Start on road to wealth by sending today for our Free Book of Plans, Our Free Plan Offer and Special Proposition to Carpenters and Contractors.

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I saw your "ad" A. C. and B.
Ours is an absolute SCIENCE
It permits of no chance-medley of compounds. It prevents the use of ingredients of untested quality—it eliminates haphazard guessing as to quantities.

It took years of experience and experiment to bring our formula to their present state of perfection.

Never will we chance their efficiency. Exacting science guards them against laxness of quality—it protects them against non-uniformity.

BRIDGEPORT STANDARD WOOD FINISHES
—always have and always will give the most satisfactory results—yesterday, today, tomorrow.

They develop the natural beauty of the wood without raising, obscuring or clouding the grain.

They give an elastic, tough finish that insures permanence of beauty—wonderful durability.

Leading architects, contractors and furni-ture, piano and car manufacturers have used them for years—because they are practical, easy to apply, economical and of uniform best quality. Let us prove them to you.

Write For Sample Panels
We will be very glad to mail you on request a series of sample panels showing numerous wood finishes in new and staple effects. You will find them useful and practical.

Address Dept. L-3

An asbestos “Century” shingle roof needs no painting either when first put on or afterward—and no repairs. Weather does not flake off the shingles or split them up at the nail holes, as it does natural slates. An asbestos “Century” shingle roof literally “outlives the building without painting or repairs.”

These shingles are the most economical roofing in the market. There is no breaking; they are easy to lay, saving in labor; and they are only about half the weight of slate, so that a considerably lighter roof frame may be used. Add to this saving in first cost the absolute freedom from painting and repairs, and the economy is without question.

Members of the roofing trade and others who are interested in keeping abreast of advances in building materials should write to Keasbey & Mattison, Ambler, Pa., for their handsome folders showing asbestos “Century” shingles on buildings of all kinds in every part of the country.

The Peerless Water Heater
No house nor apartment can be considered in any way modern nor complete which does not have an unfailling supply of pure, hot water at all times on tap. The Peerless kitchen boiler, of the Peerless Heater Company, Chicago, Ill., has solved this problem perfectly. In a few minutes, any time, day or night, the Peerless will supply hot water at any tap in any room in the house.

The Peerless makes you absolutely independent of any other hot water fixtures in the building. They may all go wrong. The Peerless never fails.

It is made of galvanized iron, and tested up to 200 pounds pressure to the square inch.

The Peerless needs no heat from the outside. It is a self-contained heater, using gas or gasoline for fuel, and 98 per cent of the heat it generates goes directly into the water.

There’s nothing about it to break down.

It works with or without a vent pipe, as you please. None is needed to carry off the fumes, because there are no fumes.

It cannot clog up, because the water in it circulates and it has no dead arms or coils. On the outside the Peerless looks like almost any other kitchen boiler, but the illustration will show you the inside construction and its extreme simplicity.

The heat, generated in the burner strikes the water spreader or disk and passes directly into the water, causing it to circulate. The disk or spreader is used for the purpose of spreading the water; it also prevents the flame from coming in contact with the bottom of the boiler, thus protecting it against the gas flame. In the Peerless there is
ARE YOU A FIRST CLASS DRAFTSMAN AND DESIGNER?

Without doubt many readers have in the past wished to be successful, first-class Draftsmen and Building Designers, and probably often looked for a long time at plans and drawings, trying very hard to figure out certain lines, or had experienced an intense desire to be able to do the best drawing in best up-to-date manner; and many men in most any kind of business, especially in Architectural lines, have often felt greatly embarrassed because unable to read even a simple sketch or unable to make any kind of businesslike drawing.

No Carpenter is first-class and competent unless he is an A-1 Draftsman in addition. Without this knowledge he can never rise any higher and will remain only a Carpenter paid by the hour or day.

To become a successful Draftsman it is necessary, first of all, to receive the most practical and personal training. Not a lot of school or book knowledge, but practical Drafting room work.

Mr. F. V. Dobe, Chief Draftsman of the Engineers Equipment Company (Inc.), Chicago, has for many years made a practice of giving personal and individual Drafting instruction in complete Architectural Drawing and Building design; and is prepared to accept a few more personal students, young or old.

His instruction is given by mail, but must not be compared with ordinary “for all alike” correspondence school lessons, as all the work is laid out personally by himself and prepared especially for your individual requirements and advancement. He treats each student according to the student’s ability; and with his individual practical method, which consists of actual Architects’ work, thereby giving the student the necessary required practical experience, he is able to qualify any experienced or absolutely inexperienced intelligent man.

He does not give or sell diplomas, but insists on your work being the only practical and necessary evidence of your ability, and able to do the talking for you. He guarantees by contract to qualify you in a few months by his practical instruction to be able to hold a first-class Draftsman’s position. Instructions are given until competent in every respect. Mr. Dobe furnishes to his students, as a premium for the best practical drawing, and with which to make the best drawings, one of the finest complete Drawing Outfits, including a full set of German Silver Instruments, worth $13.85, free this month.

His “Successful Draftsmanship” book, size 6 by 9, is sent free with full particulars to any one interested, by writing to F. V. DOBE, Chief Draftsman.

Engineers Equipment Co., Chicago.
Why Atkins Saws Cut Faster

We want every carpenter to read these facts about Atkins Saws, and then test them by trying an Atkins at our risk.

The Atkins blade is taper-ground. Thinnest at the back and thickest at the tooth edge. Note this difference: The Atkins blade tapers all the way from tooth edge to back. Less spreading (or "set") is needed on the teeth of an Atkins Saw, because the tooth-edge is already wider than the rest of the blade. So wherever the teeth go, the rest of the blade follows without a struggle. The path is wide enough to give plenty of clearance. No binding! No buckling! No sticking! It's easy to see why the Atkins should be exactly what it is—the fastest, cleanest cutting, easiest running saw you ever touched.

Atkins Saws Stay Sharp Longer

Atkins "Silver Steel" is made on our own secret formula, and gas-tempered by secret process. Scientific analysis shows that it is actually better steel than is used in most razors. "Too good for saws", perhaps, but not too good for Atkins Saws. The blade is light, strong, and yet flexible. Whenever bent, springs right back into shape. Carpenters have proved, over and over again, that Atkins Saws hold their keen edge three to four times as long as any other saw.

Our "Show Me" Trial Plan

Buy an Atkins Silver Steel Saw. If it isn't exactly what we claim, if it isn't the best saw you ever put through a board, take it back to your dealer and your money will be refunded. That guaranty protects you. You don't risk a cent. Be sure the blade bears our name and says "Silver Steel"—that's our best saw!

FREE To Carpenters

Write us today (enclosing 10 cents in stamps to cover postage) and we'll send you free a good strong Nail Apron, together with our Carpenter's Time Book and our handy booklet, "Saw Sense".

Address Carpenter's Department

E. C. ATKINS & CO., Inc.
INDIANAPOLIS, IND.
Largest Exclusive Saw Manufacturers in the World.

nothing to conceal. By looking at the picture you can see the burner, pipes, connections and how the water is kept in constant circulation. The cold water is carried to the bottom of the disc through the left-hand pipe and comes instantly in contact with the hottest part of the boiler, just above the flame. It is quickly heated and rises as it warms through the center tube to top of boiler. The heat, after passing around the disc, continues all the way up through the center of boiler. The pilot, when lighted, will keep the water heated and in circulation any length of time at almost no cost.

A word to owners, architects and plumbers concerning the wisdom of providing satisfactory hot water supply may be in order.

Nobody ever moves out of a flat or house on account of the failure of the hot-water supply where a Peerless heater is put in. It prevents all possibility of the hot water failing. It enables an owner to keep his tenants. The shell of the Peerless is never hotter than the water inside of it, so that when desired it can be painted with aluminum, which is easily kept clean and looks well.

The Peerless is a combination heater and boiler, with a storage capacity sufficient for the whole house. The water in it being always under pressure, always flows. The Peerless is available for country houses, where there is no gas. A gasoline burner is attached in such cases, and the effects and results are precisely the same as where gas is used.

The combustion of the gasoline vapor in the Peerless gasoline burner is perfect and complete. It makes no odor whatever. There is a large trade in the Peerless kitchen boiler that can be handled to good advantage in nearly every locality with proper display as pertains to this gasoline outfit; there being many suburban homes and outlying villages where they do not use gas.

With the Peerless gasoline outfit a country home can be supplied with hot water throughout the house equal to that of the finest city palace, at a very reasonable expense for installation and extremely low cost in operation.

The Peerless Heater Company, Chicago, Ill., will be glad to furnish complete information concerning this matter to readers of the American Carpenter and Builder on request.

Protective Casting for Iron and Steel

The accompanying illustration is a photographic demonstration of results produced with the acid proof coating of
Do You Want A Southern Home?  

Health, Wealth and Happiness in the Finest Climate Imaginable Awaite Settlers in this Productive Country

100,000 Acres located at Yellow Pine, Washington County, Alabama, along W. & C. R. R., only 60 miles from the Gulf Coast.

These Cheap Railroad Lands Offer Unbounded Opportunities

A few acres of this Alabama Land is a great protection for the little ones.

One of These Productive 10-acre Farms in Alabama, the Wonderland! Can Yield an Income of $3,000 to $5,000 a Year to Settlers. Investors are assured of big returns.

A Limited Amount of $25 and $50 Lands will be sold for $17.50 Per Acre.

On Easy Terms

Any size Tract from 10 acres up Terms as low as $1.00 per month $5.00 down and $5.00 per month for 10 acres No Swamps No Stones No Irrigation Necessary Sweet, Pure Water

Read What These Men Say

CHARLES H. STOCKWELL, Evansville, Ind., after visiting our Alabama lands:—

"If you are working for a small salary and have saved $500, here's your chance to buy a home of your own, with 10 acres of rich land that will yield an income of $4,000 to $6,000 a year—a home that will pay you who have struggled along for years at a dependent, paying rent and saving little. It's true—and we can prove it.

"If Horace Greeley were living today he would say: 'Young man, go South.'

"If business keeps you North in Winter, spend your Summers in Alabama, in comfort and at a profit.

W. & C. R. R., when they move upon our land.

This District Has National Fame as a Health Resort

The Summers are cool and pleasant; the Winters mild and balmy.

This Is How Alabama Farmers Make Money

A farmer near these lands this season planted Irish potatoes in February, harvesting a big crop in May; then he planted corn on the same ground, harvesting in early autumn, following with provender and a crop of vegetables, which he will harvest in the winter

Price of a 10-acre tract.

Pecans and peaches afford a considerable source of income. They are sold to the cotton and turpentine distillers and for home consumption.

The largest peach orchard in the Sou

Markets

Sixty miles from the coast; 23 hours from St. Louis; 26 hours from Chicago. One railroad through the tract—one on the west and one on the south. Half the land within 1 1/2 miles of a railroad.

Free transportation to prospective settlers and investors over the Washington & Choctaw Land Co., St. Louis, Missouri. Send me complete information about your $17.50 Alabama Homeseeker Investment in 6198 Times Building, St. Louis, MO.
Four Salary Raises
Amounting to Over
$1,000 a Month

To prove to you that we can raise your salary we give the evidence below. Photographs of these men are shown in the order that their experiences are given:

Mr. F. M. Lege, Jr., of Eagle Pass, Texas, has steadily advanced from a position in the office of an Electric Light and Power Company to his present position as general manager of a large company, and has increased his salary over $300 a month.

Mr. H. G. Davis, 236 Chestnut Street, Kingston, Pa., advanced through I.C.S. Training from employment as a miner to district superintendent in the coal-mining department of the D. L. & W. R. R., with his salary increased $300 a month.

Mr. A. K. Harford, 854 53d Street, Oakland, Cal., was engaged as an engineer-room steward. I.C.S. Training has advanced him to superintendent of an electric-light plant with a salary increase of $160 a month.

Mr. Ralph M. Snyder, Ft. Wayne, Ind., a clerk in an express office was enabled, through his I.C.S. Training, to enter the architectural field. He now has an office of his own with commissions this year amounting to about $12,000.

Here we have in all four increases in salary amounting to much more than a thousand dollars a month. On an average of 300 advancements of this kind are reported to us voluntarily by students every month. On this basis it is estimated that I.C.S. trained men earn increases in salary amounting to over $20,000,000 in one year.

You can get your share of these increases if you have the will power to start. Mark and mail the coupon below and our experts will tell you how we can adapt I.C.S. Training to your individual needs and pocketbook, in your own home, in your spare time and without having to give up your present work. Use the coupon now.

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Nothing Down!
Lyon & Healy's Great Offer!

Majestic Piano
FREE TRIAL

The great popular-priced instrument of the day. Choice of fancy woods, including genuine mahogany.

Majestic Piano, Style 1—$155
Majestic Piano, Style 2—$165
Majestic Piano, Style 3—$175

These new style instruments are exclusively a music-trade production. They in no way resemble the pianos sold by furniture houses, for their tone-quality is in accordance with the ideal of experts who make a life study of music.

Nothing Down!
30 DAYS' FREE TRIAL

You may purchase a Majestic Piano from us with the understanding that it may be returned within 30 days and the trial will not have cost you one dollar. The Majestic Piano contains many excellent features which we must be glad to explain to you, when you are at our factory. The information which you will acquire in the course of a visit to our showrooms will prove invaluable.

Cash or Time
You may take nearly three years to pay for a Majestic or you may pay as cash—as you choose—the price is the same.

The Piano That Can Be Exchanged
The Majestic can be exchanged at full price paid toward a Steinway, Lyon & Healy or Washburn. Hence it is the favorite, inexpensive piano among all far-sighted and conservative buyers.

Exchange Dept.
Wabash Ave, and Adams St.
CHICAGO

Write for Catalog

Big Orders—Busy Men

Our very biggest orders come from the very busiest men. They haven't the time to waste with cheap, ready roofings of questionable quality. They roof with

GAL-VA-NITE

because they know that the owner will be satisfied. They use this famous "mica-plated—triple asphalt-coated" ready roofing because they know that it is easiest to put on and the best to depend on.

Don't risk your reputation by using a poor roofing. GAL-VA-NITE will stand up under the most adverse climatic conditions.

We want every good live contractor, carpenter and builder in the country to know GAL-VA-NITE.

The manufacturers

Union Roofing & Mfg. Co. 1109 E. 7th Street, St. Paul, Minnesota

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
BIGGER PROFITS
FOR THE CONTRACTOR
Who Uses The
WATROUS NO. 17 SCREEN HANGER
The same pieces, arranged to suit, will hang either a full or a half screen from either the top or side. Storm sash should be hung from the top, but this is the only way to hang a screen.
Only four screws to set instead of twelve, a saving in labor of two-thirds. A carpenter who has bought other hangers, could afford to throw them away, buy the Watrous No. 17, and make more money on the job. Mounted working model sent free postpaid to dealers or job.
Unlatch the screen, swing it out, and the flies are outside the house. Brush them off and close the screen. Do this once a year and the house will be clear of flies.

E. L. WATROUS MFG. CO.
DES MOINES - IOWA

Granite Roofing
This great pier was roofed nine years ago with Granite Roofing. At the present time it shows no signs of wear, and is expected to give excellent satisfaction, without attention or repairs, for at least ten years longer. Unlike the ordinary ready roofing, which is adapted only for temporary buildings and sheds, Granite Roofing may be economically used on all kinds of structures. Its unusual weight, 140 lbs. to the roll, gives to this roofing unparalleled durability. It can be laid by any one who can handle a hammer. Granite Roofing has a surface of sea-grit, thoroughly imbedded into its composition, which makes it fireproof and takes the place of the paint or coating.

Send for free Sample and Booklet, and learn about this best of all roofings.

EASTERN GRANITE ROOFING CO.
1 Hudson St., NEW YORK
CHICAGO ST. LOUIS

states the wonderful durability of this acid proof coating along the lines of protecting structural iron and steel plate construction of every conceivable kind against corrosion and decay, due to electrolysis, the elements, acid and alkali fumes or other conditions.

The Todd Clamp
The Todd clamp, shown in the accompanying illustration, manufactured by the Brown Specialty Machinery Company, 73-75 West Jackson boulevard, Chicago, is made of malleable iron, 3/16-inch thick. It is designed to fit on a wood bar 1 1/4

by 3 inches, thereby eliminating the extra weight and spring of an iron bar, and permitting the use of the clamp for work of any size. The movable jaw is equipped with a hardened steel bushing against which the feed screw is centered, thereby directing the entire wear against this bushing instead of against the jaw itself. The end of the feed screw is also hardened. By replacing this bushing when worn, the life of the clamp can be materially increased. The feed screw is centered by a split washer which also holds the movable jaw rigid. Set screws are used for holding the bushing and washer in position. The rear stationary jaw has a bearing surface, 2 inches square, and both stationary jaws are provided with milled plates which firmly grip the bar when tightened by the hand wheel screws. The nut on the forward stationary jaw is 1 1/4 inches long, while the feed screw operating the movable jaw is 7 1/2 inches long and is cut seven threads to the inch.

New Orleans Office Moves
The Star Expansion Bolt Company, makers of the famous Star expansion bolts, have moved their New Orleans, La., sales office to No. 504 Audubon building, where strangers and friends alike will be welcomed by D. S. Miller.

Rising Automobile Prices
The Maxwell-Briscoe Motor Co., Tarrytown, N. Y., desire to indorse heartily the following editorial which appeared recently in The Co-Operator:

The praises of the automobile industry have been sounded so loudly and the lightning-like rapidity of its progress has become the subject of so much exuberant description in all quarters, that the casual reader of this may be apt to regard the following sober contemplation as a piece of pessimism—which, of course, it isn't.

The demand for automobiles is greater than ever. The plants of the various manufacturers are busier than at any previous time, and the output will be far in excess of that of former seasons—the Maxwell-Briscoe Motor Company alone preparing for the production of no fewer than fifteen thousand cars.

In spite of this unrivaled activity we are willing to go on record as the authors of the prediction that the man who justifies his hesitation about the purchase of a car with the mental reservation: "I'll wait until they are still cheaper," will be doomed to disappointment.

This should not be interpreted as an undue urging of the prospective buyer to send in his order and check sooner than he intended, because as far as the representative makers are concerned such urging will hardly appear necessary in view of the certainty that even a vastly increased production will fall short of meeting the entire demand.
A house gets its market value quite as much from its appearance as from what it represents in dollars and cents. An unattractive, cheap roof knocks enough off the selling value to offset the "saving" a dozen times over.

Asbestos "Century" Shingles dress up the house, make the most of its good points, and fill the eye of the prospective purchaser. And they protect the house from fire and weather as no other roofing can.

Dense, elastic sheets of asbestos fibro-cement, formed and compacted by tremendous hydraulic pressure, cannot decay; improve with age and exposure. Absolutely fire-proof. Three colors, numerous shapes and several sizes. Ask your Roofer for new quotations. Write for Booklet "Roofing 1909."

The KEASBEY & MATTISON COMPANY, Factors, Ambler, Pennsylvania

Rough Weather Roofs

SHOULD BE CONSTRUCTED OF

32 POUNDS COATING

ROOFING TIN

"The Terne which turns the elements"

MF Roofing Tin has been steadily growing in favor and demand for over fifty years. Light, strong, durable reasonable in cost — an MF roof will neither leak, crack, burn, nor blow off. The most satisfactory roofing material obtainable is a good terne plate — MF.

American Sheet and Tin Plate Company

General Offices: Frick Building, Pittsburgh, Pa.

DISTRICT SALES OFFICES:
New York Chicago St. Louis Philadelphia Pittsburgh Detroit Denver Portland San Francisco New Orleans Cincinnati
Export Representatives: UNITED STATES STEEL PRODUCTS EXPORT COMPANY, New York City
There's Money in You in Steel Ceiling Work

And you can easily handle it. Our construction is planned to simplify erection and reduce number of pieces to handle, thus saving time, labor and expense. Any good mechanic with the aid of our working drawings can easily do the work and secure a neat, one-piece, workmanlike job.

We help you by preparing free suggestion drawings and estimates, send sketch and dimensions of room or rooms to be covered and we will submit suggestions and quote exact prices on the material delivered at your depot.

Sykes Metal Lath & Roofing Co.

SYKES METAL LATH

The lath that is positively different to anything else made; different because it combines more good features.

Cup lath is the only Expanded Metal Lath that can be plastered on either side—cannot be applied wrong because both sides are alike.

We make two kinds—Sykes Expanded Cup Lath, and Sykes Trough Lath. Both are supreme for their own purpose.

The top illustration shows Trough Lath, bottom cut depicts Cup Lath.

NO PICKLED LATH

Sykes Lath is absolutely guaranteed not to have been pickled in an acid bath. This means that the weight and thickness is not reduced and is less susceptible to rust. Requires no furring out from studs because it is self-furring.

It has been approved by U.S. Government and by leading architects, carpenters and builders throughout the country. In fact, when we say it is the best ever made we are simply stating a proven fact.

Samples and prices mailed upon request.

Sykes Metal Lath & Roofing Co.

NILES, OHIO

No doubt, right here the reader might interpose: "Well, if that is the case, why does the manufacturer not increase his output?"

The answer is: "He can't."

The demands of the automobile industry for raw materials have reached a point where the resources of allied industries have become inadequate. For some of the raw materials the demand has grown at a rate that has almost completely exhausted the visible supply, with the inevitable result that the prices of these commodities have soared to unaccustomed heights because of the strain imposed by the demand on a depleted market.

Take the item of rubber. We can still recall the time when crude Up-River Para gum could be bought in the open market at thirty-five cents a pound. Only about a year ago the price was well below the dollar mark. Today crude rubber sells at two dollars and ten cents with no prospect of a decline and with an almost appalling scarcity of the material. Yet wheels must be shod with rubber tires and the automobile manufacturer is compelled to purchase his tire equipment at a much higher cost than was ever exacted of him before; the heydays of the rubber pool arrangement pales into insignificance when the present-day price of rubber is considered.

The increase in the demand for special steels, owing to the unusual requirements of the automobile industry, is without parallel, again with the consequence that the 1909 prices of steels show a rise over the figures of 1908 of from 15 to 25 percent. Here, too, the needs of the automobile industry have brought about a scarcity of raw material, so that it has become a matter of absolute fact that the automobile manufacturer is governed in his plans, not by the amount of business he can command, but by the amount of raw material he is able to obtain. When it is considered that the pig iron production in this country rose from 15,036,018 tons in 1908 to 25,283,346 tons for 1909, an idea may be had of the unprecedented increase in demand for raw materials.

That the steel market will remain stringent for some time to come may be conjectured from the renewal of the buying of rolling stock by the railroads and from the enormous sales of steel rails, which lately have amounted to 100,000 tons per week.

It is unfortunate for the automobile industry that the increasing signs of general prosperity have not only brought increasing demands for raw materials from other quarters but are also responsible for new industrial combinations in various lines, which, by consolidating their interests, are able to maintain a high price for their productions of raw materials.

Owing to the demands of the automobile builder the visible supply of trimming materials and stuffing hair is practically exhausted. Before the advent of the automobile industry the meat production of the country produced enough hair to satisfy all needs. But animals are killed, not for their hair and hides, but for their meat, with hair and hides as a mere by-product, which now commands a larger profit for its sellers than ever.

Not a bit less in importance than the condition of the raw material market, is the present situation of the labor problem.

Nor are these conditions confined to the automobile manufacturer proper; they are also found in all establishments making the accessories forming part of the complete motor car. The scarcity of good labor and the difficulty of securing raw material also contribute to the reasons which make for increased prices in these lines.

Of course, even this chaotic upheaval of resources will ultimately right itself, though relief is not in sight yet.

But it would be unwise for the public to expect the prices of cars to pursue a downward course at the same time when the price of nearly every part going into their manufacture keeps constantly rising. Indeed it should be the cause for
The best light under the sun is produced by the STANDARD and SIMPLICITY LIGHTING SYSTEMS. Better than electricity or city gas, cheaper than kerosene or candles, with none of their objections. No smoke—no soot—no fumes—no work filling lamps or trimming wires. A light that does not overheat the air, suitable for the cottage or for the mansion, for the city or country home. Anyone can operate them and be entirely independent of gas and electric companies. Produces a Hydro-Carbon Light—white, brilliant and penetrating. Endorsed by insurance underwriters, recommended by users.

**BIG MONEY FOR LIVE AGENTS.**

We want a few field workers who are willing to represent us in every community. Exclusive territory given. A well organized "Sales System" aids the agent in his work. Write today for large illustrated catalogue and further particulars.

**THE STANDARD-SILLET LIGHT COMPANY**, 6 West Michigan Street, CHICAGO, ILL.

Mantels of Wood, Brick or Tile furnished direct from factory at attractive prices, freight paid.

**PILE and GRATES of every description**

Our No. 51 Grate is guaranteed to heat from 8,000 to 10,000 cubic feet of space in zero weather.

**CATALOGUE FREE**

Contractors and Architects, send us the names of your clients requiring Mantels, Grates and Tile for same as well as Tile Floors and Wainscoting of every description. We will make it interesting for you. Send plans for estimates.

**HEITLAND GRATE & MANTEL CO.**

No. 127 South Fifth St., QUINCY, ILL.

Storm Sash and Screen Hanger No. 1

The time is drawing near at hand when carpenters and builders begin putting up storm sash and it might be well to say that the best and most convenient goods are always the cheapest in the end.

We make the only Ball and Socket Hangers on the market.

One trial will convince you that they are the best.

Our No. 1 Fastener is made of the best steel wire. It holds the Sash firmly against the blind stop and prevents rattling.

**MANUFACTURED BY THE**

**DIEHL NOVELTY CO.**

SHEBOYGAN, WIS.

This Looks Good to Others, How Does It Look to You?

$1.00 to Be Given away in Prizes.

We want you to know us, and to know our goods, and their superior qualities and conveniences over all others. We take the lead in a practical line of builders' hardware. To satisfy yourself of this fact send 10 cents in stamps for sample of any article that we manufacture. Seeing is believing. Send for catalogue and satisfy yourself.

In order to introduce our goods to the contractors, we are offering the following prizes to contractors that use the largest amount of our goods between April 1st, 1909, and January 1st, 1910. All coupons should be filled out and sent in before January 15th, 1910.

1st Prize — Gentleman's Gold Watch, 16 size, 17 jewel, hunting case. Howard movement, value $35.00.
2nd Prize — Gentleman's Gold Watch, 16 size, 17 jewel, hunting case. Hamilton movement, value $25.00.
3rd Prize — Gentleman's Gold Watch, 16 size, 17 jewel, open face. Elgin movement, value $15.00.
4th Prize — Gentleman's Solid Gold Watch Chain. value $12.00.
5th Prize — Gentleman's Solid Gold Vob, value $10.00.
6th Prize — Gentleman’s Solid Gold Locket, diamond set, value $8.00.
7th Prize — Gentleman's Solid Gold Locket, value $5.00.

DIEHL NOVELTY CO.

DIEHL NOVELTY CO.

Name of Contractor: ____________________________ Address: ____________________________

Name of Dealer from whom goods were purchased: ____________________________ Address: ____________________________

Fill in with amount of goods used:

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Trinidad Lake Asphalt is the greatest weather-resister known. It makes roofing last. We use it to make Genasco—and we own the Lake. If you want a roof insured against leaks, damages, and repairs get

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THE BARBER ASPHALT PAVING COMPANY

Largest producers of asphalt, and largest manufacturers of ready roofing in the world.

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BUY A BOVEE FURNACE

Direct from the Factory
AND SAVE $20.00 TO $100.00
ON YOUR HEATING PLANT
They Actually Save from One-third to One-half of the Fuel

We have one of the best equipped furnace factories in the west and make more than 30 different furnaces of seven leading styles and patterns, as also those of several modes of furnace that may be desired, either Loyojet or Hotwater, sufficient to heat a large church or school house, down to a cottage heating plant complete with all pipes, registers and fittings for any style of furnace desired. Our furnaces are the only furnaces having a self ventilating system for every part of the house. We ship our furnaces cut to fit. Any handy man can install them without the aid of a fitter. Catalogue and full specifications free.

Bovee Grinder & Furnace Works
50, 8th Street Waterloo, Ia.

A Booklet telling how to get water Fresh from the well for suburban homes. How to avoid storage of water. The most economically operated independent water system, etc.

Sent Free on Request

UNITED PUMP & POWER CO.
495 Old Colony Bldg. CHICAGO

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER

small wonder if the selling figures of automobiles were to accommodate themselves to the changing conditions under which the cars themselves must be made; in other words, we believe it very likely that not very long hence automobiles, instead of costing less, will cost more.

In fact as it now looks automobiles must go up in price, and they will, very soon.

Concrete Work in Winter

It is always risky work for property owners or builders to lay concrete during cold weather, but in extreme cases this class of work can be done if proper precautions are taken. In the cold and damp winter months concrete sets more slowly than during the warm periods, and for this reason it is argued that the centering under it must be left in position for a proportionately long time. Below a temperature of 50 degrees Fahrenheit concrete sets slowly, and below 40 degrees is very inactive. At 32 degrees concrete freezes before setting. Remove any concrete known to have been frozen. A slight frost extending only one-fourth of an inch into concrete is not detrimental to strength. Some builders claim that concrete can be frozen, thawed out, and will then reset. This may be so in many cases, but it is always best to remove any concrete in which the freezing has extended throughout the mass.

Concrete work can be carried on when the temperature is as low as 20 degrees (never lower), if the precaution is taken to encase the building with canvas and place heating grates or salamanders under the floor being concreted. Keep the building at a uniform temperature of about 60 degrees. Do not allow intense heat to come in contact with the concrete, as it will dry out the concrete before it has set. Cover the concrete after being laid with some good insulating material, such as sawdust, straw, cement bags, manure, etc. Be sure to cover the concrete work before stopping work at night, even though it is warm during the day time. Salt dissolved in the water used in mixing concrete helps to prevent freezing by lowering the freezing point. A 5 per cent solution (by weight) of common salt is ordinarily used and is not detrimental to strength when so used. Calcium chloride has an advantage over salt in that it reduces the freezing to a lower point. Dissolve in the water needed to mix concrete 2 pounds of calcium chloride for each bag of cement used.

Heating the cement, sand, stone and water used in the concrete is helpful, but the materials must never be heated to a temperature of over 100 degrees, as the strength of the concrete will be weakened. Be sure that the concrete is thoroughly set (not frozen) before any centering is taken down. Leaving all the upright supports in place, remove the sides of the columns and beam boxes and thoroughly examine the concrete. Then remove the slab centering, and lastly the main supports. Leave the centering in place a few days longer rather than take chances. Do not take down the centering too soon.
**DIAMONDS ON CREDIT**

**CHRISTMAS PRESENTS**

You Can Easily Own a Diamond or Watch, or present one as a gift to some loved one. Send for our beautiful descriptive catalogue containing 1,400 illustrations of all that is correct and attractive in Diamonds, Watches and Jewelry. Then in the privacy of your home or office, select whatever you desire. We send on approval the goods you wish to see. If you like them pay one-fifth the price on delivery and the balance in 8 equal monthly payments. Your credit is good and we give you the advantage of lowest possible prices. We ask no security—No endorsements—No interest. We make $5 or $10 do the work that $50 does in a cash store and we guarantee of value and quality. Do your Christmas shopping now conveniently and leisurely. Don't wait until the Christmas rush is on.

Now is the time to make choice selections. If you are considering a Diamond or Watch as a gift, you will find the Loftis System a great and timely convenience on anniversaries, birthdays, weddings, holidays, etc. Diamonds as an investment are better than a savings bank. They are increasing in value from 15 to 20 per cent each year. They are better than real estate because you can realize their full value at any time. Our Christmas catalogue is free. Write for it today. Do it now.

**THE OLD RELIABLE ORIGINAL DIAMOND AND WATCH CREDIT HOUSE, EST'D 1858**

Dept. P802, 92 to 96 State St., Chicago, Ill.

Branch Stores—Pittsburg, Pa. and St. Louis, Mo.

**LOFTIS BROS. & CO.**

$50

CHRISTMAS SPECIAL

Ladies' and Gentlemen's Solid Gold Diamond Ring
Terms: $5 a month

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**HESS SANITARY LOCKER**

**Something New for Your Home**


Better Than Wood and Costs No More

No home is complete without a Hess Sanitary Bathroom Locker. It is suitable for the finest bathroom. It is dust, germ and vermin proof and easily cleaned with warm water.

The locker is made to recess into the wall and projects 1 inch from the face of wall. It is a beautiful piece of work measuring 16 x 20 inches and measures 19 1/2 x 2 1/2 inches inside. Below the mirror is an open shelf 15 x 5 inches. Style "C" is the same size and finish; made to recess into the wall but to be suspended on the wall.

Price of Style "A": - $8.00
Price of Style "C": - $9.00

Without Mirror deduct $1.50. Without Open Shelf deduct $1.00.

We will prepay freight charges anywhere east of Missouri and North of Ohio Rivers, on orders for two or more.

The same cabinets with a different arrangement inside, are used in office buildings, clubs and institutions for Toilet Lockers. Send for illustrated Circular Showing Several Sizes.

We are makers of the Hess Steel Furnaces, Important Booklet: "Modern Furnace Heating," Sent Free.

**Hess**
920 Tacoma Building
Chicago

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**Hotel Cumberland**

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S. W. Cor. Broadway at 54th Street

Near 50th St. Subway Station and 53rd St. Elevated. "Broadway" cars from Grand Central Depot pass the door.

**Headquarters for ARCHITECTS and BUILDERS**

Near Depots, Shops and Central Park.

**New and Fireproof**

**Strictly First Class**

**Rates Reasonable**

$2.50 with Bath and up.

Ten Minutes Walk to Twenty Theatres

Harry P. Stimson, formerly with Hotel Imperial
R. J. Bingham, formerly with Hotel Woodard

Send for Booklet

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**Save Your Plate Glass**

Use the Bar that will best protect it from high wind pressure, etc. "The Petz Bar." It is strong, rigid, artistic in appearance, and requires the least space of any safe bar. The superiority of the "Petz Bar" is recognized by those who are best able to know—the insurance experts and architects.

With this bar the glass is set from outside—an advantage that will at once occur to you.

Our booklet, "Modern Store Front Construction," shows the application of "Petz Bars" to various forms of fronts. Send for it to day.

**DETROIT SHOW CASE CO.**

SOLE MAKERS

491 West Fort Street
DETROIT, MICH.

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
Give Your Shoulders FREE PLAY
Don't make them sore and tired by wearing the old-style rigid-back suspenders, which tug, strain, and chafe with every move you make. Get a pair of President Suspenders and learn what real suspender comfort is. The sliding cord in the back of President Suspenders (which is not found in any other suspender) permits them to "give and take" with every motion of the body. They rest lightly upon your shoulders and allow you perfect freedom of movement. The Extra Heavy Weight, made especially for workers, outlasts several pairs of ordinary suspenders. Light and medium weight for dress wear. Extra lengths for tall men. Every pair sold with the maker's guarantee—satisfaction, new pair or money back. If your storekeeper cannot supply you, we will, postpaid, upon receipt of price, 50c. Get a pair today.

THE C. A. EDGARTON MFG. CO.
739 Main Street SHIRLEY, MASS.

Turnbull Universal Window
THE LADIES ALL APPROVE IT
This window can be washed outside and in, the cleaner standing on the floor.
It is dust-proof, also air-tight and water-proof.
There is no danger to life or limb in cleaning this window, as the cleaner stands on the floor inside the building.
This is the window people have been looking for, for years.
It can be made both in sheet steel and wood.
It is cheap and durable.
This window slides up and down the same as any ordinary window.

Estimates submitted for any building
Write for circular and descriptive literature.

TURNBULL CO., 771, 263 La Salle St., CHICAGO

Don't Neglect Your Furnace
In spite of all the improved methods of heating the house which have been devised in recent years, the problem of heating the country home is still a vexed one. If wood is available for fuel, the big fireplace is sure to play a big and important part. The system which is generally regarded as the most desirable, especially by those who pay attention to sanitary precautions, is that of the direct radiation furnace, which does much to ventilate the house as well as to heat it. If the furnace is treated merely as a producer of heat, and the right treatment is given to the problem of distributing the heat in the several rooms of the house, it lends itself to the solution of the problem with special facility.

It should always be remembered that the principle governing the distribution of furnace heated air is the siphon principle. There should be a double system of pipes, one to carry the hot air to the rooms, and one to return the cool air to the furnace. The hot air should be taken in bulk as near its destination as possible. By this is meant that the hot air destined to warm two adjoining chambers should go in one pipe to a point near the registers, and then be divided and sent to each room. To prevent the hot air from this common conduit finding its way into either room in too great quantities, it is necessary to partition the conduit for a certain distance below the point where it is divided into two pipes.

The size of the conducting pipes must be carefully adjusted to the heating surface which they are to serve. One must have in mind the distance from the furnace, both vertically and laterally. A room directly over the furnace, to which the heated air will naturally arise, does not need as large a pipe as one situated at a distance from the furnace.

The cold air intakes must be carefully managed, and there should be no less than two of them, taking cold air from either side of the house. Cold air should always be taken from the lee side of the house, and that it may be so taken there must be an intake from more than one direction. It is quite possible to warm a house perfectly by means of a furnace fire, but not unless special care is exercised in every detail of the installation, and intelligence is always brought to bear in its operation. The furnace is not an automatic machine and must not be treated as such. All trouble is justified by the fine, live warmth diffused by a good furnace properly attended.

Non-Burnable Kindling
According to the Lumberman's Review, there was weeping and wailing and gnashing of teeth up on New York's East Side a few days ago when a pushcart vendor of kindling wood sold some carefully-prepared bundles of fireproof wood to the dwellers in that section. It happened this way: The Germans had
Fighting the Trust!!

The Smashing Anti-Trust Fight Now On!

Trust Prices
Eclipsed at Last!

An absolutely first-class, high-grade watch at a price within the reach of the people—The Burlington Special Anti-Trust Watch.

The World’s Masterpiece of watch manufacture—the Burlington Special—now sold direct to the public at its rock-bottom, anti-trust price (and besides without middlemen’s profits).

We do not care what it costs—we will uphold our independent line and so we are making the most sweeping, baffling offer ever made on watches.

Some trusts are legal and some are not. We do not say that the watch trust is illegal; but we do say that the methods of the giant factories in making “contracts” with dealers to uphold double prices on watches is very unfair—unfair to us and unfair to you. Hence our direct offer on the Burlington at the very same price the Wholesale Jeweler must pay.

This is your opportunity—NOW—while this great anti-trust offer lasts—to get the best watch made anywhere at one-third the price of other high-grade watches. Furthermore, in order to fight the Trust most effectually, we even allow terms of $2.50 a month on our finest watch—easiest possible payments at the rock-bottom price, the identical price the WHOLESALE Jeweler must pay.

WATCH BOOK ON REQUEST

Now do not miss this opportunity. At least we want you to know about WATCHES and WATCH PRICES. Write today.

Be Posted

Send a postal or letter, or simply mail coupon without sending a letter and get the free book.

BURLINGTON WATCH CO.,

19th & Marshall Blvd., Chicago

Burlington Watch Co., Dept. 6589, 19th and Marshall Blvd., Chicago

Please send your free book on watches and copy at 3, 6, 12, or 24 months’ interest. With this smart anti-trust offer, Burlington is able to give you this great watch at its rock-bottom price—$2.50 a month. This is your opportunity to get the best watch made anywhere at one-third the price of other high-grade watches.
been holding a big Saengerfest in Madison Square Garden, and under the rules of the building inspectors they were obliged to use treated or fireproofed lumber in the construction of booths and stands. After the show was over this old lumber was torn out and piled in a heap outside the building. The pushcart man found that it was his for the asking, and, assisted by a lusty crew of co-laborers, he proceeded to transfer it to his woodyard, where it was worked up into kindling and tied in five and ten cent bundles. It was sold to the tenement dwellers at special bargain prices. It was at this stage of the proceedings that real trouble began. It was bought for use as kindling. Newspapers printed in English were lighted, but the wood would not burn. Then some papers printed in Greek and even Yiddish were resorted to, with the same result. The dwellers sought Sig Ripkin, the push-cart man, for an explanation. Sig had decamped. An irate housewife, mystified by this non-flammable wood, thrust a stick into a neighbor's glowing coal fire, but even this process did not even char the wood. Sig, who had defied and fought single-handed the kindling-wood trust, winning a hero's laurels in the tenement district, is now ostracised, and all because the science of fire-proofing wood has been so far perfected that lumber is actually made non-flammable by the process.

Novel Method of Concreting Under Water

The operation of depositing cement under water to form concrete foundations and similar work is always interesting, and this character of work is being done at the present time on a larger scale than ever before in the construction of the Detroit River tunnel of the Michigan Central Railroad. In depositing the material "tremies" are made use of, operated from a barge carrying the concrete mixing plant. These are riveted steel tubes, slightly longer than the deepest part of the river, and discharge the concrete directly into the forms. To exclude water while the first batch is being laid, two or three empty cement bags are stuffed into the top of the tube and the wet concrete is poured in, forcing the bags down and the water ahead of them, and by continually maintaining the tube full of concrete no river water can enter. After the concrete begins to emerge from the lower end, the tube is kept several inches under the surface of the mass, forming a seal. As the concrete builds up in the forms, the tremie tubes are raised in the towers supporting them on the barge. A floater rises with the concrete and indicates through a wire to the operator on the scow when the tremie should be raised. The wet concrete distributes itself from the bottom of the tremie tub in a circle about ten feet in diameter.

Selling Furnaces Direct

Nothing is more essential to home comfort and good health than proper heating. The problem of which system to install is not given as careful study and attention as it should by many home builders. Too frequently the purchaser depends upon those not trained or qualified to know the actual necessities in the matter of the size furnace required to properly heat a given space and in the plan by which the heat is to be distributed after it is generated in the furnace. Whether the building is a five to twelve-room house, a large store, church or school, a specific, definite heating plan should be made, based on careful study of the plans of the building from basement to garret. The heating plan should be laid out by a heating expert. In very rare instances does an architect, contractor or furnace dealer possess the special knowledge and experience necessary to qualify him to properly prepare the best heating plan. Of course lots of them guess at it and come near enough to prevent discovery by the owner of the fact.
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<th>Description</th>
<th>Price, each piece</th>
<th>Price, per 1,000 feet board measure</th>
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<tr>
<td>2x 4—8 feet long, No. 1 grade Pine</td>
<td>8c</td>
<td>$15.45</td>
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<tr>
<td>2x 4—12 feet long, No. 1 grade Pine</td>
<td>13c</td>
<td>16.00</td>
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<tr>
<td>2x 4—16 feet long, No. 1 grade Pine</td>
<td>16c</td>
<td>15.45</td>
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<tr>
<td>1x 6—10 feet long, No. 2 grade Pine</td>
<td>7c</td>
<td>12.85</td>
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<td>1x12—10 feet long, No. 1 grade Pine</td>
<td>23c</td>
<td>22.50</td>
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<td>16c</td>
<td>15.45</td>
</tr>
<tr>
<td>1x 6—No. 3 Sheathing</td>
<td></td>
<td>9.65</td>
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