THE "DUTRO"
Sash and Door Holder

A Practical Tool for Practical Men

Will Not Slip, Easily Adjusted,
Always Ready, Fits Any Tool
Chest, Will Hold Any Sash
or Door in a Perfectly
Rigid Upright
Position

"The Dutro" will not mar any highly finished
door or floor, as the jaws and feet are rubber lined.
Steel clutches are provided to clamp over the
rubber feet for use on rough floors, cement floors,
etc., to protect rubber against unnecessary wear
and tear.

No More Broken Glass

Will save its cost in fitting and hanging 25 doors
and sash in the prevention of broken glass
alone, to say nothing of the added conven-
ience and pleasure of having a perfect tool
always at hand to fit your doors and sash.

If your
hardware dealer cannot supply you, send us
$3.00
and we will deliver one prepaid.
Read our Guarantee.

Wherever, Whenever You Want It It's There

OUR GUARANTEE
If the "Dutro" does not fulfill all claims made for it your
money is refunded for the asking. We take your word.
Send for "A Talk With Dad." It tells you all about it.

DUTRO MANUFACTURING CO.
331-333 S. Main St.,
MASON CITY, IOWA
Do Your Own MILLWORK
ON THE JOB—
This is our NEW IMPROVED RIG with WATER HOPPER Cooled three HORSE ENGINE.

The “Little Shaver” Portable Saw Rig

THIS rig, ready to start when it reaches you, weighs 520 pounds crated; includes two saws, cross-cut and rip; dado head for plowing window and door frames, emery wheel for sharpening your tools, wrench, etc. The engine furnished with this outfit is specially built for this kind of a rig, and it has a belt tightener attachment which keeps the belt from getting loose and can be adjusted in a few minutes. It is water hopper cooled and will develop three horse power under continuous brake test, which gives an abundance of power to run the saw.

The “Little Shaver” Floor Scraper

THE simplest and best floor scraping machine on the market. Has direct pressure on the knife, the handle having no pressure bearing control, as in other floor scrapers. With the entire weight on the blade gives the knife a uniform pressure at all times, with no possible chance of jumping and making a wavy floor.

Machine weighs 100 lbs. boxed for shipment.

WRITE For Our Folder and SPECIAL AUGUST PRICE

Inter-State Equipment & Engineering Co., Old Colony Bldg.
Chicago, Ill.

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
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

TOLEDO, OHIO

Miller's Lock Mortiser

IS SCIENTIFIC

The regulation of the feed by the screw in the head is what makes the cutting of hard or soft wood easy.

The actual use of the tool to cut an opening for a lock is ½ minute. The whole job is done in 5 minutes. Cutters for five sizes of locks ¾" to 1½" is furnished with each machine. Its merit has been demonstrated thousands of times. Sent on Trial.

Butt Mortiser

Cuts the seats for butt hinges in doors, jambs and other work. It does the work in one-third the time and makes a neat, clean, accurate job. Price, including rule gauge, 75 cents.

A. W. Miller Mfg. Co.

Western Office: RIVERSIDE, CALIF.
Main Office: CINCINNATI, OHIO.

A NEW MACHINE

THAT WILL NOT ONLY DO THE WORK OF
10 Floor Planers and Scrapers

But will do it more perfectly

We claim and have proven that it has no equal competitor on the market for perfect work. We also manufacture the electric scrubber and polisher.

Floor Sanding and Polishing Machine Co.

Driven by Electricity. Automatic. 628 Race Street
Throughout. Ask for Booklet "F." PHILADELPHIA, PA.

THE BOSS

The Boss Double Swivel Head Floor Scraper and sand papering device is the only complete outfit. It costs nothing to convince yourself. The head can be set at any angle by loosening one bolt and by loosening two bolts you can tilt the knife up or down to suit the kind of lumber you are working. The price will surprise you. For further information call on or write the manufacturer,

G. J. Kepplinger
DWIGHT, ILLINOIS

"THE WORLD'S BEST FLOOR FINISHING MACHINE"

IT PLANES—GRINDS—SANDPAPERS—OILS—POLISHES.

Valuable Perpetual County Rights

For Sale by JOHN M. CROOK
Austin, Chicago, U.S.A.
The Anderson Automatic Adjustable FLOOR SMOOTHER ALWAYS DOES PERFECT WORK

FOR SCRAPING AND SANDPAPERING
NEW OR OLD—HARD OR SOFT WOOD FLOORS

A WONDERFUL NEW FEATURE IS THE AUTOMATIC MOTOR SPRING CONNECTED WITH THE DRIVE WHEELS

It does away with the old back-breaking method of pulling a dead weight. Furnishes momentum on the cutting stroke and doubles the operator's capacity.

OTHER IMPORTANT FEATURES

The Machine has two detachable weights and may be operated at 130 pounds or 150 pounds.
The Knife Clamp can be adjusted sideways (for shearing cut) and up and down to fit any desired width of beveler or square edge scraper.
The Knives can be sharpened in the machine.
The Handle can be telescoped for use in short space and can be raised or lowered instantly to suit height.

ACCESSORIES AND ATTACHMENTS

THE A.A.A. KNIFE SHARPENER
Produces a perfect cutting edge.

THE A.A.A. SMOOTHING SHOE ATTACHMENT
Produces an absolutely true surface.

THE A.A.A. SANDPAPERING ATTACHMENT
Produces a uniform fine finish.

Handy tool kit furnished with each outfit, including Knives enough to scrape 60,000 square feet of floor and the necessary sharpening tools.

TRIPLE “A” MACHINE CO.
1020 CHICAGO OPERA HOUSE BUILDING

CHICAGO, U.S.A.
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. It embodies the mechanical principle of the plane. Planes and scrapes floor at one operation. Does better work than most hand work. Most rapid scraper on the market.

"Wavy" Floors an Impossibility
Makes floor scraping simple and agreeable. Particulars on request.

THE HAVEN MFG. CO. : : RACINE, WIS.

BLAKE QUICK ACTING VISE
For Cabinet Makers and Wood Workers. Simplest—Strongest—Cheapest—Best
Send for Catalogue of all kinds of Vises
PRENTISS VISE COMPANY, MAKERS
44 Barclay Street, New York, U. S. A.

PARKS’ COMBINATION WOODWORKING MACHINES
Make a Complete and Economical Operating Mill for Carpenters and Contractors
Take our No. 410 for instance—here is a Combination of Three Machines in One—
A Table Circular Saw
A Six-Inch Jointer and Boring or Routing Attachment
heady for Instant Use
No line shafts and large amount of floor space required.
SIMPLE—STRONG and Ready-to-do with little power. We deliver on short notice.
Prices and Catalogue on Request.
Parks Ball Bearing Machine Co.
Fergus and C. H. & D. Ry., CINCINNATI, O.

PEARSON’S IMPROVED Nailer
HERE’S an improved hand nailing tool that can be used for driving small nails and is especially adapted for driving shingle nails.
No trouble to handle, because it weighs only about two pounds. Can be used with gloves or mittens on and in any season.
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.
Start saving money by making the Pearson Nailer part of your equipment. Your dealer has them; if not send to us. Complete information for a postal.
PEARSON MFG. CO., Robbinsdale, Minn.

New Features
These three features form the Ackermann New Knife Sharpener—the invention that ensures a perfect cutting edge all the time. It means better floor scraping than hitherto—it means quicker floor scraping. Not a talking point but a device that saves dollars for every user.

Ackermann Floor Scraper
The Ackermann is the best floor scraper. We guarantee it to do more, better and easier work than any other machine on the market. If it doesn’t you get your money back. Send for details of our offer under which any contractor may test the Ackermann Rapid Floor Scraper and Ackermann’s New Knife Sharpener free at our expense.

J. B. ACKERMAN CO., 100 Pearl St., Grand Rapids, Mich.

Our Guarantee is a Protection to every Purchaser.
THE
1909 Crescent Catalogue
IS JUST OFF THE PRESS
It contains eighty pages of valuable information for the prospective purchaser of wood working machinery.

If you are interested in motor-driven, wood-working machinery you should by all means get it at once. If you do not want the motor-driven kind, send for a copy anyway, describing: Band Saws, Saw Tables, Jointers, Shapers, Borers, Swing Saws, Disk Grinders, Planers, Planer and Matchers, Variety Wood Workers, Band Saw Blades.

THE CRESCENT MACHINE CO.
224 Main Street
Leetonia, Ohio : : U. S. A.

A Weber Floor Scraper
On Free Trial
I want you to be the judge of the Weber Double Acting Floor Scraper. I want you to make the trial, upon which you shall base your judgment, at my expense. All you've got to do is ask me to send you one of my machines and I'll do it. I'll take all the risk. All I ask you to do is try the scraper and if it isn't the best you ever saw send it back to me—at my expense. You can try it for 10 days.

Send for one of my booklets—it gives you the truth about floor scrapers. And send for my 1909 price list of my 10 different priced machines weighing from 78 to 135 lbs.

JOHN F. WEBER, President
WEBER MFG. COMPANY
670 71st Ave., WEST ALLIS, WISCONSIN

THE FLOOR SCRAPER
THAT'S ABSOLUTELY PERFECT
Of all the floor scrapers on the market not one can be quite as good as the Star, because no other embraces such durable features.
There's practically nothing about it to wear out. Consider the benefit obtained by the new mechanical principle, The principle that means better work and quicker.

Stop yourself you are There's practically nothing about it to wear out. Consider the benefit obtained by the new mechanical principle, The principle that means better work and quicker.

The principle that means better work and quicker.
The Star does clean work. A patented Ball and Socket device allows the blade to be set diagonally at any angle. This gives a shearing cut to the machine. It means a finished floor free from planer marks and "waves." It works the same on old floors as it does on new.

Four NX THAT'S ABSOLUTELY PERFECT

BATES & EDMONDS MOTOR CO. LANSING, MICHIGAN

THE FOSS GASOLINE ENGINE
DIRECT TO YOU
We save you from 25 to 40 per cent on the Highest Grade Gas or Gasoline Engine.
Write for Price List and Catalogue.

FOSS GASOLINE ENGINE CO. 754 Portage Street KALAMAZOO, MICHIGAN, U. S. A.
Hotel Euclid
Euclid Avenue and East 14th Street
Cleveland, Ohio

OFFICIAL HOTEL
of the AMERICAN
MOTOR LEAGUE

300 Rooms : European Plan
Rates $1 to $4 Per Day

Headquarters for Auto Tourists
Many of the leading garages located
within one block of the Hotel

HOTEL EUCLID CO.
FRED. S. AVERY, President

GOODELL MITRE BOX
Made of STEEL - Cannot Break
First in Quality
and Improvements
Automatic Stops
for holding up saw.
Corrugated Backs.
Graduated.
Gauge for duplicate cuts and many
other features.

Send for Circular

GOODELL MFG. CO., Greenfield, Mass.

The HOLDALL BRACE
IT'S NEW and has jaws which adjust themselves to
the shape of the shank. They grasp and hold securely
straight, tapered, round and square shanks. The sleeve is
correct in shape for comfort to the hand and to obtain
the firmest grip. Every part of the Brace is made with
greatest care. We say without hesitation that the Holdall
is the most perfect tool of its kind yet offered. Made in
usual sizes, with 8, 10, 12 and 14 inch sweep. Ask for
circular giving further description.

Millers Falls Company
28 Warren Street, NEW YORK

EVERYTHING IN
PLUMBING AND STEAM GOODS

TO EVERYBODY
SAVE YOU
30 to 75%

$8.50 and up
This White Enamel Sink
Cast in one piece.
The latest idea.

$10.95 and up
White Enamel Bath Tub of guaranteed
quality. Will wear
forever.

$11.50
Low-down and
high combination
Closets. Guaranteed
to be equal to the best in
the market.

$7.50 and up
Artistic Lavatories Various
designs.

$3.00 and up
Laundry Tube
all styles and sizes.

$65.00 and up
John Hardin Co.,
ONE-QUARTER CENTURY AT
4549 Cottage Grove Avenue - CHICAGO
Send for Catalog M.

This DUMB WAITER
complete ready
to erect for -

$18.50

SELF RETAINING MACHINE
HARDWOOD CAR
SECTIONAL WEIGHT
ROPE, GUIDES, HARDWARE,
knocked down and shipped with the only
complete directions for erecting
ever issued

SEND FOR SPECIAL PAMPHLET

R. M. Rodgers & Co.
174 Washington Av., BROOKLYN, N. Y.
Will you take a little of your time in order to look into a proposition that means a big saving of money to you? If you will, then I want to send to you the

**ACME FLOOR SCRAPING OUTFIT**

**ONE WEEK'S FREE TRIAL**

basis at my expense. Try the machines. See what they can do by actually working with them and then decide whether you want to buy them or send them back.

This is the only sensible way to buy a floor scraper. Remember it costs you nothing to try my outfit, so send for it today.

Further information and booklet mailed on request.

JOSEPH MIOTKE

247 Lake St. MILWAUKEE, WIS.
Save 1/2 Cost on First Job

Builders' Folding Steel Scaffold Brackets save time and lumber, are brackets. Less trouble and are practically made entirely of steel. Removed instantly.

Guaranteed to carry all weight necessary for cornice, shingling and other work of like character.


PLATE GLASS

Bath Room Fixtures
FOR RESIDENCES, HOTELS, OFFICE AND APARTMENT BUILDINGS

Absolutely sanitary, require no cleaning, never wear out or show the effects of use. Not affected by hot or cold water. The modern 20th century toilet and lavatory fittings.

PLATE GLASS TOWEL BAR

Price $1.50
No. 141 24 inches, adjustable. Also made in 30, 36, 42 and 48 inch lengths at slightly higher prices.
Round glass towel bars, $2.00
Adjustable glass towel shelves, $3.50, $4.00, $6.00

We also sell plate glass with polished edges for table tops, any size, and glass push plates for use in fine residences and apartments, manufacture and re-silver mirrors, etc.

CATALOGUE SENT FREE ON APPLICATION

Geo. H. Anderson & Co.
Manufacturers and Jobbers of Plate Glass Specialties
281-291 W. Superior Street - - CHICAGO

THE "IDEAL" FLOOR SCRAPER

The new time, labor and money saver.
A high-grade machine that does perfect work.

None Superior at Any Price
Has many new important features. Send your order today.

It is Guaranteed

T. L. PHILLIPS, 118 River St., Aurora, Ill.

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
Machines for Contractors

Every carpenter and builder can afford to invest in one, or more, of these machines. From our stock of 500 new and rebuilt machines contractors can obtain sufficient machinery to make them independent of local mills and their attendant delays and high charges.

Stop paying somebody else profit—put it in your own pocket. Be in a position to estimate under competitors. You can do this by installing your own machinery. All our machinery is of special construction to secure fine finished surfaces and to reduce sandpapering to a minimum.

Prices are lower than you think. Send today for our monthly list of rebuilt machines (free to carpenters and builders).

Chicago Machinery Exchange
7-11 No. Canal Street, CHICAGO

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 works like a plane. A FINE TOOL for fine work. Price, express prepaid, $1.25. (Write us for Catalogue.)
TOOL CATALOG FREE

Every Carpenter should have one.
A postal brings it.

GOODELL-PRATT’S NEW No. 9.
CATALOG CONTAINS 272 PAGES, ILLUSTRATING AND DESCRIBING USEFUL AND LABOR-SAVING TOOLS

In this edition we are showing a number of new items which everyone should know about.

Goodell-Pratt Company
Toolsmiths
Greenfield, Mass., U. S. A.

MONITOR SASH LOCKS

(PATENTED)
NEVER BREAK

BECAUSE THEY ARE MADE OF VERY HEAVY GAUGE METAL AND PERFECTLY CONSTRUCTED

If the upper sash drops, the Monitor "Never Break" Sash Lock will pick it up from a lower point than any other, adjust the sashes perfectly, prevent all vibration and lock securely, so it cannot be opened from the outside.

MADE IN TWO SIZES AND ALL FURNISHED BY
The Champion Safety Lock Co.
Geneva, Ohio

GRAND RAPIDS
All-Steel Sash Pulleys

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

If you make ten or ten thousand window frames, we can save you money and give you a superior sash pulley. We are the largest sash pulley makers in the world. We ship direct, or through dealers and jobbers everywhere.

Write for catalogue and free samples and prices on gross, barrel, or any quantity.

Direct from the makers to you. Inquiries welcome.

GRAND RAPIDS HARDWARE CO.
34 Pearl St., Grand Rapids, Mich.
"DEFIANCE" HIGH GRADE
Wood-Working Machinery
Invented and Built By
The Defiance Machine Works
Defiance, Ohio
For Manufacturing General Wood-Work
Also Special Machines for making Hubs, Spokes, Wheels, Wagons, Carriages, Automobiles, Rims, Shafts, Poles, Neck-Yokes, Singletrees, Hoops, Handles, Spools, Bobbins, Insulator Pins, Balusters, Table Legs and Wood Dishes.

ARE YOU INTERESTED IN MITRE BOXES?
If you are, it will pay you to investigate the LANGDON ACME. It has all of the advantages of any other box and several that others do not have. They are made in three sizes and put up with varying lengths of saws.

MILLERS FALLS COMPANY
28 WARREN ST., NEW YORK, and MILLERS FALL, MASS., U. S. A.

This Improved Level
especially designed for Builders, contractors, etc.
Has a telescope 12" in length. Lenses of the best optical quality. Magnifying power 25 diameters. Object glass 1½", Horizontal circle 4⅞" in diameter, graduated from 0-90 each way.
Instrument complete in a polished hard-wood box with strap, plumb-bob, sun-shade, adjusting pins and trivet.

Every Instrument guaranteed to be accurate in every respect. Special combination price of Level and Architect's Rod, $43.00.

DAVID WHITE COMPANY
419 East Water Street, MILWAUKEE, WIS.

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
A Swell Head and A Swell Door are both pretty stiff propositions, but the latter is a mere trifle when you have The Taylor Door Jamb Adjuster. A few turns of the screws make a perfect fit, whether the door swells or shrinks. Send for folder explaining this cut.

JAMES L. TAYLOR MFG. CO., Bloomfield, N. J.

CARPENTERS!

Look for this trade mark on tools when buying
Planes, Chisels, Auger Bits, Drawing Knives, Gouges, Spoke Shaves, Etc.

Registered

It will protect you against inferior goods. "Ohio" Tools are made in only one quality and that The Best.

Every "Ohio" Tool is covered by a broad guarantee. Write for our CATALOGUE No. A, if you are interested in Good Tools.

OHIO TOOL COMPANY
Columbus, Ohio

THE AMERICAN Combined Level and Grade Finder

All Progressive and Up-to-date Mechanics as well as Manufacturers having use of a Level, are getting one An instrument with which at one glance you can get the true slant on any line or grade either in degrees inches or percentage, or all at the same time, and will at once give the exact distance needed to plumb up a true level.

A Civil Engineer that you may have with you at all times.

The most practical, durable and convenient instrument of the day.

The longitudinal recess which is shown in cut is well worth the low price of the instrument.

Write at once for large list of testimonials from all over the United States, and special introductory price given only to first applicants with privilege of taking agency.

Address Edward Helb, P. O. Box No. 55, Railroad, Pa.

PARKER VISES

MADE ESPECIALLY FOR WOOD WORKERS

FOR SALE BY DEALERS

CHAS. PARKER CO.
MERIDEN, CONN.

THE BEST IS THE CHEAPEST. No plane like it. See this paper for December, pages 321, 330 and 322, for facts and large pictures. This advertisement authorizes any dealer to sell THE BEST IS THE CHEAPEST.

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The most practical, durable and convenient instrument of the day.

The longitudinal recess which is shown in cut is well worth the low price of the instrument.

Write at once for large list of testimonials from all over the United States, and special introductory price given only to first applicants with privilege of taking agency.

Address Edward Helb, P. O. Box No. 55, Railroad, Pa.
The World's Famous Line of Wood Working Machinery

The accompanying cut shows the Universal Wood Worker arranged with our double outside bearing, cored band saw frame, 12-inch jointer head instead of 10-inch. We have arranged it in this way so we can use the 12-inch planing attachment.

Get our prices at once.

SIDNEY TOOL COMPANY, Sidney, Ohio, U. S. A.

Dorn's Revolving Mitre Box
Saw compound as well as plain mitres any width with a back saw 4 inches wide

SEND FOR BOOKLET
IT TELLS THE STORY

MANUFACTURED BY
Braunsdorf-Mueller Company
1093 E. Grand Street, ELIZABETH, N. J.
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.

Sargent & Company
1149 Leonard Street
New York

The Best Ever
You Will Never Regret Buying One

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

Philadelphia Pattern
Best Quality Crucible Trowel Steel.
Wood Handle.

Genuine Marshalltown Trowel
Ten Rivets. Imitated because they are good.

Marshalltown Trowel Co., Marshalltown, Iowa

“Sterling” Transits and Levels
Fully 75 per cent of the Phila. Engineers who have purchased Transits or Levels this season selected “STERLING” Instruments.
Because, after inspecting our Factory and making a personal field test, they were convinced that “STERLING” Transits and Levels are without a fault.

Send for 225 page Illustrated Catalogue of Surveying Instruments, Engineering and Drafting Supplies.

ISZARD-WARREN CO., INC.
1122 Vine Street. Philadelphia, U. S. A.

LUFKIN STEEL TAPES and RULES
ARE INDISPENSABLE FOR ACCURATE WORK
Made by The Lufkin Rule Co., Saginaw, Mich., U. S. A.
For Sale Everywhere.
Send for Catalogue.

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The “UNIVERSAL” ADJUSTABLE HANGER 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; it sold in sets, half sets, or in any other way the trade demands; indestructible; will outwear a dozen screens.

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Equal 500 miles northward. Perfect privacy with doors and windows open. Darkness and insect-proof in sleeping rooms. Write for our catalogue, price list and proposition.

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One Man with the No. 5 Union Combination Self-Feed Rip and Cross-Cut Saw

can do the work of four men using hand tools, can do it with ease, can do it better. Consider the amount saved—three men’s wages—and compare with the cost of the “Union” saw. In a short time the machine will pay for itself and then the wages saved will go into your pocket.

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SUITABLE FOR various kinds of work—ripping, (up to 34 inches thick), cross-cutting, mitering, etc., and with additional attachments rabbiting, grooving, dadoing, boring, scroll-sawing, edge-moulding, beding, etc., almost a complete workshop in one machine.

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Equal in quality and usefulness to any Brace Bit

**HANDLE OF SELECTED COCOBOLO WOOD**

**THREE SIZES ONLY**

Cutting 4-32, 6-32, and 8-32 Holes

**Price Postpaid 15 cents each**

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*Standard Shutter Worker*

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Automatically locks the blinds in any position desired.

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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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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.

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ROTH BAND SAW MOTOR

Tell your friends what a fine outfit you have — it will increase your business. Study the picturealittle. Decide you want the BEST — the BEST is not expensive.

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We invite the Severest Comparative Tests

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We want you to have a copy, for it is a booklet you really need in your business.

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Slight thumb pressure opens the jaws to receive the screw and instantly you are ready for business. (The bit centers itself in the slot.) Holds the bit firmly, but releases itself as the screw is driven home. Slips back on the blade out of your way when not in use, but right at your fingers' ends when you want it quickly for awkward or out of reach places. Pays for itself every time you use it. Costs but a trifle.

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Your Dealer Sells “Yankee” Tools.

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Enclosed find my check for blinds. I am pleased with them and sorry I did not have them put throughout the whole house.

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Comfort!
Economy!
Convenience!

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BRIDGE & CANAL STS.
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They are built of selected material by mechanics having years of experience in this line of work, and before leaving our factory are given severe tests and are carefully inspected.

This not only insures a perfect Carrier, but also a perfect working Carrier, and one that will stay right after it goes in the barn.

The “Diamond” Hay Tool line is complete and includes Carriers for Steel and Wood Track, Steel Track, Forks, Slings, Pulleys, and other sundries.

Write for Catalogue No. 70, giving complete description, and other useful information.

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Ten Special Features:

1. Saw is held above work when not in use.
2. Swivel is automatically locked at any angle.
3. Two sockets in swivel for use of long or short saw.
4. Narrow opening in back of frame, especially adapted for small work.
5. Steel rod uprights for saw guides.
6. Stock guides for holding work in place.
7. Extra wide range of work—will saw at angle of 36°.
8. One-piece frame with detachable malleable iron legs.
9. Construction thoroughly mechanical; all parts inter-changeable, and readily replaced if lost.
10. Quickly and easily put together or taken apart for carrying.

Send for our Catalogue No. 34

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on every article, write for my free illustrated Catalog. Shipments promptly made from a very complete stock of guaranteed goods. Small orders are as carefully handled as large ones.

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FLY SCREENS

Our work is far superior to the usual output of local mills and has a style and finish not obtainable from those who do not make a speciality of fine screens. All our screens are made of Wire Cloth, laminated, galvanized, genuine bronze, fastened by the most approved methods. Intending purchasers may have free, by mail, samples of woods, finishes, Wire Cloth, and a copy of catalogue and price list. Agencies in nearly all large cities. Agents wanted in smaller cities. Special terms to Contractors and Builders.

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Not on the quantity—but the quality of the goods you sell. We can give you quantity, both in the Hoke Reversible Shutter Hinges. They'll suit with instant approval from every carpenter and builder. Our Hokes are made to last and have been doing so for 25 years. Our Shutters, after being shown, have been ordered at once. Wherever you find this ad, you'll find our Hinges.
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.

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.

THE TRUE MITER BOX
Cut shows saw raised about two inches above bed and is held there until ready for use. When ready to use the saw, all that is necessary is to touch the lever or to take hold of the handle and the saw will drop down to the stock.

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If you are a Contractor or Material Man. We are in a position to quote you prices which are worth your while. Builders' Hardware is our specialty. Better find out what we can do for you. Write and receive this book.

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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.

JOSEPH DIXON CRUCIBLE CO.,
JERSEY CITY, N. J.
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 lathe 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.

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**The Celebrated Barton Tools**

For carpenters and all other woodworkers are unequaled by any other make for keen hard, smooth cutting edges. If your hardware dealer does not handle them, send direct for catalog. Be sure and specify "CARPENTER'S CATLOG".

**MACK & CO., 20 Brown's Race, Rochester, N. Y.**

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**BUILDERS AND GENERAL HARDWARE**

MOST COMPLETE LINE IN THE WEST

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FOR HOTELS, RESTAURANTS, MARKETS, ETC.

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**GOSSETT HINGES**

No experiment. Eight years of growing sales prove them the best. Find out for yourself.

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**The World's Best Saw Bench**

Heavy, finely constructed—a quality machine throughout. Equipped with every convenience and graduation for quickly and accurately getting out work. No time lost—no chance for mistake.

To make money—save it by installing the Crescent Double Revolving Arbor Saw bench. Positively the only Full Universal Saw Bench built. Send for complete catalog.

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360-362 S. Front St., Grand Rapids, Mich.
Coming right down to the economy question Clincher Lath has got everything beaten.

As a practical man you can understand the principle by the illustration. Notice the level plastering surface—the construction that's different.

**Sagging Is Impossible**

Sagging between the studding is rendered absolutely impossible if Clincher Lath is used. Read what progressive carpenters have to say about it. Easier to handle and easier to erect than any other lath on the market. Prove this by sending to Department R. C. for samples. Free to anybody interested.

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MIDDLETOWN
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**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.

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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.

SAMSON CORDAGE WORKS, BOSTON, MASS.
**The Peerless Nail Set Holder**

Absolutely Noiseless. Does not rattle.

**Don't lose your nail set**

It is not wearing out the pockets of your clothes.

Not mixed up with the nails in your apron pockets.

Not in the basket or tool chest when wanted.

Not lost among the shavings.

It is always in your hand available for instant use.

**To operate**—Hold hammer in right hand, press spring with thumb of left hand. Nail Set will drop into your palm ready for use. To replace, simply place Nail Set in hole and give a quick shove. The attachment can not be injured by falling or striking on end of hammer handle.

Ask your Hardware Dealer for it, or mailed to any address upon receipt of 25c. Stamps accepted.

**The Peerless Specialty Co.**

77 N. Water St., Rochester, N. Y.

Agents wanted.

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**To make your saw run sweet**

Use a "SPECIAL" Saw Set. Anybody who can read numbers can use it.

Chas. Morrill, 283 Broadway, New York

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**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
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4. Lever locks at any angle
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7. Automatic stops for holding saw

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H. C. Marsh Co.

606 Race Street, Rockford, Ill.

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**Stop! Look! Listen!**

"Pullman" Spring Sash Balances

**Ask Us About Them**

Pullman Mfg. Company

(Rcenter Park)

Rochester, N. Y., U. S. A.
Our Home Builders’ Number

WE TAKE pleasure in announcing that the October number of the *American Carpenter and Builder* will be our “Home Builders’ Number.” We want to invite every one of our readers to join with us in making it the biggest and best and most interesting of all the numbers yet published.

The editor has prepared a great many special features for this number of more than usual interest—practical, illustrated articles which will be of real value to all carpenters and home builders.

The main interest, however, will center around those pages devoted to “Typical American Homes.” This has always proved a very popular feature. It will consist of photographs with floor plans and statement of actual cost of the best work done by readers of the *American Carpenter and Builder* during the past year.

We invite you all to send in such pictures so that all parts of the country may be represented. We want this “Home Builders’ Number” to be typical of the splendid work being done by our readers. Mark on the back of each picture where the building was put up and to whom credit should be given for its construction and design; also please state the actual cost complete. In order to make each exhibit as useful and complete as possible a sketch showing the floor plans should be included wherever possible.

Address all photographs and drawings to the Editor of the *American Carpenter and Builder*. They will be returned to you, if so desired, promptly and in good condition. Send them in as soon as is convenient so that we may have plenty of time to make up this feature of our big October number in a way that will do credit to the members of the Big Family.

Lumber Cut for 1908

DURING the year 1908, 31,231 sawmills in the United States manufactured 33,289,369,000 feet of lumber, according to a preliminary report just issued by the Bureau of the Census. These mills also cut 12,106,483,000 shingles and 2,986,684,000 lath.
Lumber manufacturing, like every other industry, felt the effects of the business depression which began in October, 1907. Consequently the production in 1908 was below that for the previous year. In 1907 the cut of 23,850 sawmills was 40,256,154,000 feet, the highest production ever recorded. Notwithstanding, therefore, that in 1908 reports were received from 8 per cent more mills than in 1907, the decrease in lumber cut reported by them was slightly over 17 per cent.

Washington, as for several years past, still ranks first among the states in lumber production, its cut in 1908 being 2,915,028,000 feet—a decrease of 22.8 per cent over the cut in 1907. Nearly all the lumber in Washington is Douglas fir, the market for which was seriously affected by the panic. Louisiana ranks second, with 2,722,421,000 feet, a decrease of 250,000,000 feet or 8.4 per cent over the cut in 1907. Louisiana is first in the production of both yellow pine and cypress. Cypress is a particularly useful and valuable wood, and apparently the manufacturers of it did not suffer as severely from dull times as did the manufacturers of yellow pine and Douglas fir. Mississippi was the third state in lumber production in 1908, with 1,613,315,000 feet, against 2,003,270,000 feet in 1907. Eight other states manufactured over the cut in 1907. Arkansas ranked fourth, with 1,524,008,000 feet—a decrease of 31.6 per cent over the previous year's output, and Wisconsin fifth, with 1,656,991,000 feet—a decrease of nearly 17 per cent over the cut in 1907.

In Texas, where the lumber industry is confined almost exclusively to yellow pine, the falling off was very heavy. The total cut of the state in 1908 was 1,524,008,000 feet—a decrease of 31.6 per cent over the cut in 1907. Eight other states manufactured more than one billion feet each of lumber last year. In the order of importance they were: Michigan, Oregon, Minnesota, Pennsylvania, Virginia, Alabama, North Carolina and West Virginia. California and Maine, other states which reported more than one billion feet each in 1907, went just below the figure in 1908. The totals for a few states were greater in 1908 than in 1907, but this was chiefly due to the larger number of reports secured in those states in 1908. In Georgia, for instance, a particularly close canvass increased the number of mills reporting nearly one-third, while the resulting increase in reports of total production was only 6 per cent. In Massachusetts, 610 mills reported a cut of 384,526,000 feet in 1908, as compared with a cut of 264,231,000 feet by 518 mills in 1907. In Colorado 254 mills cut 182,096,000 feet in 1908, while in 1907, 230 mills cut 134,399,000 feet. A particularly large gain in mills reporting was made in Oklahoma. In 1907, 129 mills in that state cut 140,015,000 feet, while in 1908, 214 mills cut 158,759,000 feet.

While there are many very large sawmills in the United States, the small mills far outnumber the large ones, and it is particularly interesting to note how many of these small mills there are in the states which are not now of first rank in lumber production. The statistics for New York were collected by the Forest, Fish and Game Commission from that state, which secured reports from 2,201 mills. In Pennsylvania 2,224 mills reported to the Census, and in Virginia, 1,937 mills. In North Carolina reports came from 1,740 mills, and in Kentucky from 1,530 mills. The number of mills reporting from Tennessee was only forty less than from Kentucky. In West Virginia, Georgia, Missouri, Ohio, and Indiana between 1,000 and 1,100 mills each were engaged in cutting lumber last year. The average output per mill was 350,000 feet in New York, and 5,260,000 feet in Louisiana, these two states presenting nearly the extremes of production by small and large mills.

Yellow pine, Douglas fir, white pine, oak, hemlock and spruce, in the order named, were the woods cut into lumber in the largest quantity. Yellow pine has ranked first since it surpassed white pine in the later nineties, and it is still far in the lead. More recently, white pine has also been surpassed by Douglas fir, so that now it occupies third place.

Washington has been the principal shingle-producing state since the use of red cedar shingles became general, and it supplied three-fifths of the total output of shingles last year. Among the other shingle-producing states, Michigan, Louisiana, Maine and California were the most important. The shingles cut in Michigan and Maine are chiefly of white cedar, those in Louisiana of cypress, and those in California of redwood. Lath are generally a by-product of lumber manufacture, and are made to some extent from almost every kind of wood that is cut into lumber. Among the kinds of lath which are most prominent are white pine, Douglas fir, spruce, yellow pine, cypress and hemlock.

**Date of the Chicago Cement Show Changed**

The dates for the third annual cement show in the Coliseum, Chicago, previously announced as February 17-23, 1910, have been changed to February 18-26, 1910. The show will open on the evening of February 18 and be open continuously until the evening of Saturday, February 26, being closed, however, on Sunday, the 20th. Under the new dates the show will be open two days longer than the show held last February.

We announce with pleasure that the National Association of Cement Users have decided to hold their sixth annual convention in Chicago on February 21-24, 1910, these dates being covered by the third annual cement show. The decision of the N. A. C. U. to hold their convention in Chicago during the cement show will mean that the gathering in Chicago February next will undoubtedly be the largest gathering of cement interests ever held in the world.
Summer Houses of the Future

Suggested for the Wright Brothers or for the Man Who Would Get far From the Maddening Crowd
Florence does not exist apart from her world of art. Here architecture, sculpture and painting with all their literary and historical significance confront you at every street corner, along the river, on the open piazzas and from every hotel window. You may turn from it all in weariness, but there is no escape.

The best remedy for the weariness of having seen too much, and having still too much to see, is the resolution that Florence shall be an abiding place, that at last the time has come when it is well to cease being a wanderer on the face of the earth, and to become instead a citizen of the loveliest of all cities.

It is no weakness to yield to the spell of Florence. The greatest have been conquered by her and have allowed a few weeks of spring they had allotted as time enough to spend within her walls, to glide into months and years.

The Brownings, the Hawthornes and scores of other wanderers in the realm of art and literature lingered here, living again the lives of the great Italians, Dante, Boccaccio, Petrarch, Savonarola, and making new paths for other literary pilgrims who were to follow. The history of Florence for six centuries or more has been written by these, her lovers, in many books. Her artists have recorded her aspirations and their fulfilment on many frescoed walls and splendid canvases. But it is her architects, her workers in stone, who have best expressed the spirit and genius of mediaeval Florence.

That she was fierce and relentless in warfare, her grim and massive palaces testify. That she was the mother of all art and grace and beauty is written in most delicate lines on the slender Campanile and on the fragile lace work of the Duomo.

The great Palazzo Vecchio tells a long chapter of history in itself, when you answer the questions it raises. Why is it placed at one side of the grand plaza? Why should the battlements that surround the main building be square, and V shaped battlements surmount the upper tower?

The position of the Palazzo Vecchio records the bitter hatred of Guelph and Ghibelline. Its architect, Arnolfo, begged that it might be placed in the center of the grand plaza, but the vindictive Guelph swore that its foundations should not touch one foot of land that the hated Ghibellines had ever possessed, better by far that the building should be placed at
any angle in any corner of the city. So the Palazzo Vecchio stands today as warped by hatred as was its builder.

When the palace was completed the square machicolations, the sign of the pope’s party, adorned it. Then, the Emperor’s party, the Ghibellines, took possession of this stronghold, the home of the magistrates of the republic, and crowned it with a tower, and their swallow-tailed machicolations. A wonderful airy tower the conquerors built, rising as it does nearly 300 feet above the square palace, visible from all points of the city, and always a thing of grace and symmetry.

There is a stone in the pavement in front of this stern palace upon which is laid on the twenty-third of each May a garland. On it women kneel to pray, and all about the pavement children scatter rose petals.

It was here that Savonarola bore witness by his heroic death to the sustaining power of the gospel he preached. History records that the last glimpse his followers had of him was with hands extended in the midst of the flames, blessing the people who reviled him.

The stone floor of Savonarola’s cell-like room in the convent of St. Mark’s is worn smooth by the feet of many pilgrims. The carpentry of door and desk and chair seems the mission furniture of yester-

day and not of four centuries ago. All the work of these old builders, from a chair to a palace, is worthy of reverence, because of the conscience and sincerity that they put into their work, giving it worth not for years but for centuries.

The governor’s palace played a part in the city’s early history. The Bargello was a splendid palace of state, square and forbidding as the Palazzo Vecchio without, but containing one of the most beautiful of court yards within. The inner stairway is a triumph
of architectural art. Artists linger here through the shadows of the late afternoon transferring to canvas the browns and yellows of old armorial bearings and discolored marble.

Within the dark old Bargello, Giotto painted frescoes, and once when in his happiest mood he painted with sincerity and affection his friend Dante, with two shadowy figures behind him. The whitewash which covered the frescoes has preserved for Florence during six centuries, the head of the thoughtful Dante—her greatest poet and her greatest citizen.

There is a stern, bare house in one of the narrow streets of Florence, not more attractive than the ordinary dull house that the dweller in an Italian city calls home. It is interesting not only because it is a typical Florentine house in its cheerlessness, but because a marble tablet above the door records, "Here lived Dante." During his lifetime these very stones were denied him as a place of refuge. Banished from the city which was to him the very wine of life, he spent his declining years eating out his lonely heart in the bitterness of exile. The world has never learned to pay its debt of gratitude in time; and Dante and Savonarola hungered in vain for the reverence and affection their city today bestows so lavishly upon the very stones whereon they trod.

On the hillside of Arceti, a half mile from the heart of Florence, is the tower of Galileo. Here, an exile from Rome, the ban of the church upon him, he continued his work with his telescope under the clear skies of Florence.

The Florentines were not always men of this stern type. On the road to Fiesole, the hill that is the background of Florence, there is an Italian villa, as charm-
The Villa Palmieri where Boccaccio Lived and where Queen Victoria Spent her Florentine Winter

...ing today as it was 500 years ago, when Boccaccio and his party of gallant gentlemen and fair ladies fled from the plague in Florence to disport themselves and pass the time in story telling until the poor wretches below should be through with their dying.

The stories of these first of story tellers were gathered into the Decameron of Boccaccio, from which Shakespeare borrowed largely the material of his plays. “In this very villa,” said the guide, “did Queen Victoria stay in 1888. And not far away,” he added impartially that we Americans might not be belittled, “did Mark Twain pass one winter.”

The villa is of black and white marble, very fanciful and elaborate. One who is interested in the architecture of these old Italian villas and in landscape gardening will find the drive to this Villa Palmieri well worth the days of pilgrimage.

The two great churches in Florence that represent the Italian Gothic in architecture are Santa Maria Novella, and the Westminster Abbey of Flor...
The Graceful Campanile, Designed by Giotto

Window Detail, the Campanile

Interior of the Tomb of the De Medici, the Ruling Family of Florence
Plans were suggested for a possible means of support during the process of building. "The sensible thing to do," they said, "is to make a great mound of earth from floor to ceiling in which coins are hidden. The dome shall be built over the mound. When it is rounded out and completed, the beggars will be willing to dig away the earth and carry it off for the sake of the buried coppers." Brunelleschi listened to their ingenious contriving and went ahead with his own plans, constructing like the great architect that he was, and not the petty trickster the lesser builders would have him be. One dome within another gives the vaulting its proper support.

There was no limit to the presumption and arrogance of the old Italians. The Pitti Palace was the deliberate attempt to be supreme. When Lucca Pitti gave orders to the great Brunelleschi for the building of his palace the order read: it was so far to surpass all that the Medici had done that "the doors for the Palazzo Medici should serve only as models for its windows." The palace was planned on a colossal scale; the windows measure 24 feet, and each of the stories is 40 feet high. "The walls shall be impregnable," said Lucca Pitti.

But it is easier to order the impregnable to be built, than to build it, and Luca Pitti lived to see his fortress palace pass into the hands of the Medici. It was a possession worth fighting for; grim and forbidding as it is without, it is all color and light within with its many colored marbles, soft frescoes, and inlaid floors—a fit treasure house for the most priceless treasures in the world—the masterpieces of Florentine art, which now fill it.

Then there are days when the traveler ceases to study or learn. On these days he walks along the Vecchio. Little dove coops of houses cling to its sides. Why shop and shop keeper do not tumble off into the river over which they are suspended is a mystery; but the little houses have hugged the stone wall tightly and securely for so many centuries that they have lost the sense of fear. In former years the butcher shops lined the bridge. Now the jewelers and silversmiths display alluring bargains, giving one an opportunity to satisfy the yearning to spend his money for souvenirs and gifts.

The walk along the river at sunset lends poverty
golden Arno shot through her heart like an arrow, exquisitely beautiful in the garden grove of vineyards and olive trees.” Here come every spring 30,000 English speaking tourists. Other cities they are able to change into something modern and cosmopolitan, but the spell of mediaeval Florence is the stronger influence. The current of humanity that fills her streets sweeps by like “the golden Arno,” reflecting unconsciously her exquisite beauty, not transforming, but transformed.
MARINE architecture is a distinct branch and trade by itself, and the ordinary carpenter is not as a rule supposed to understand the technical points involved; but in recent years there has come into existence a popular feature of this work which really falls in the province of the general carpenter more than in that of the marine builder. Houseboats have been in more use in England than in this country, but in the last ten years thousands of these floating homes for summer use have appeared on our lakes, rivers and bays along the coast. Their popularity has increased now that the gasoline engine has been developed so that for a small additional outlay the houseboat can be moved from point to point under its own power. They are not power crafts by any means, but with a 2 or 3 horsepower gasoline engine installed in a houseboat it can move from one anchorage place to another on pleasant days at the rate of two or three miles an hour.

The houseboat in many cases is an old canal-boat or a second-hand flat scow with a living house built on the top of it. In the construction of this house the carpenter’s service might well be employed. The idea of this article was suggested by the record of a carpenter who three years ago took to houseboat building in a dull season and established a very important trade as a side issue to his regular profession. He lived close to an inland lake—Lake Hopatcong, New Jersey—where summer visitors were numerous. One day he had to take as part payment for a debt an old second-hand flat scow. This seemed like a white elephant on his hands, but as he had it he decided to make use of it. He patched it up so that there was no danger of leaks, and then with some second-hand lumber stored away on his place he built a 3-room house on the boat.

His intention was to live on the houseboat in the summer and rent his own home to summer visitors. But before he could find a tenant for his home, he had several applications for his houseboat, and he closed a bargain for its renting at considerable more than he could get for his house. The summer’s rent paid for the lumber and carpentry work, and left him something over. This unexpected transaction started him in his new work. He purchased for a nominal sum two other flat scows the following winter, and built houses on them and furnished them in a simple but comfortable style. The next summer he rented two of the houseboats, and sold the other outright for a very profitable sum.

Then he solicited orders for houseboats. They were popular, and he got two orders that summer for houseboats of considerable size. One of these was 30 feet long, and was made from an old canal-boat. It was fitted up inside with all the comforts of home, and proved a standing advertisement of his workmanship. The boat had an upper and lower deck, and the owners secured another order for the carpenter.
But the expansion of his business threatened to absorb all of the flat scows that could be had, and the carpenter was not yet qualified to go into marine architecture. However, he considered the matter carefully and noted the demands of the market. Very few cared for a large houseboat, but a great many wanted small ones that could rent for about $100 to $200 a season. These people wanted to live on the water, and they were not particular about the size of the rooms or the furnishings. After looking carefully into the matter, the man decided that he could find a way to secure the hulls at less expense and without much difficulty.

Flat bottom row boats 18 to 20 feet in length were common. So he purchased two of these at a nominal sum, and drawing them out of the water he patched them up, and reinforced them inside with braces and plankings. Then he bolted them together with small beams on the deck, running one across the stern and another over the bows. Two others were run crosswise from corners to corners. These beams made the boats form a two-piece hull, as shown in the drawing, and they also served as the foundation for the floors. The floor timbers were of second-hand, unmatched lumber, but over the top of them cheap canvas was stretched, oiled and painted so that the floor was waterproof. Then he built a house on top of this floor with a door in front and windows on either side. This gave him room inside for one living and sleeping room and one kitchen and dining-room combined. This boat cost him as follows: $6 for the two flat-bottom boats, $15 for the second-hand lumber, nails and paint, and $25 for the simple furnishings, some of which he purchased second hand, making a total of $46, not counting his own labor. He rented the boat for $75 for the first season, which paid for all expenses, and left him a balance, and the boat for another season.

He built five of these boats, and then decided that there was enough money in the business to warrant attempting something more ambitious. He ordered lumber for new hulls, which he decided to construct himself. A carpenter who cannot build an ordinary flat-bottom boat is not much good at his trade. The frame was very simple, and the planking of plain lumber, with seams caulked and painted. This man built his boats larger than the ordinary boat, making them 25 feet and one 30 feet long. They were only 4 and 5 feet beam, and when bolted together, with a space of a foot between each one, the total width was from 9 to 12 feet.

His latest improvement was to build a watertight deck over these boats so that they were really pontoons. This made them more buoyant and less likely to sink. The house was built on the top of the decks in the ordinary way. These boats rented as high as $100 to $200 a season. Today the man has eight houseboats which he rents out, and there is hardly a season that he does not sell from two to four. This gives him an opportunity to build that number of new ones each winter when trade is dull, and as he is sure to rent them he never loses anything on his investment.

Now this man's experience may be exceptional, but it indicates the possibilities the wideawake carpenter has in his field in working up trade as a side issue. At no time did he let the work interfere with his regular trade. He built his houseboats at odd times and when business was very slack. One winter he was out of employment, except for odd jobs, during the greater part of three months, but instead of being idle that time he practically built three houseboats and had them ready for launching the following spring. He received in rent from two of them $300, and sold the third at a clear profit of $200. So those three months out of work were after all pretty profitable.

Houseboat building naturally would not be of much value to anyone located inland away from any body of water, although these crafts are in use on our canals and it is quite common to see them towed up and down the artificial waterways to some natural body of water for the summer season. There is another builder of houseboats located fifty miles away from any lake, river or sea coast, and he has made a great success at his work. The idea of turning shipbuilder in such a locality might excite the surprise of anyone. But there was the Erie canal. It flowed within a mile of his home. So he constructed a small workshop on the line of the canal and started to building houseboats. These houseboats were launched by him in a small basin that entered the canal, and he towed the crafts
up to the St. Lawrence or down to some of the lakes or to the Hudson river. In fact, although situated far from any large body of water, this man was ideally located for delivering houseboats to any part of the country needing them. He could tap the great lakes or the Atlantic ocean and deliver his goods when ordered.

The problem is often how to get a start. The experience of the carpenter first described is the best illustration of how to do this. Build a houseboat for your own use or for renting, and if good returns are obtained build another. Then sales and orders may follow. A great many people want houseboats, but they do not know where to get them. There is no regular market for such craft and it is too expensive to deliver them to all parts of the country. It is much the better way for each locality to have its own houseboat center where they can be built and rented as needed. This field is far from being overcrowded today. There is hardly a good size lake, bay or river that does not contain possibilities in this direction.

There is one other type of small houseboat that should be mentioned in this connection. A gentleman living on a lake in the summer wanted a small houseboat for his children to play in. His family did not care to leave their cottage to live on a big houseboat, but the children were crazy over houseboats. So the man visited a local carpenter and discussed the matter with him. The result of this conference was that the carpenter purchased twelve empty beer casks, and after making the bung water-tight, he nailed them together, six on a side by two long beams. He formed a sort of raft out of these barrels by means of a platform of boards on top. This raft was so buoyant that you couldn’t sink it if you put two or three tons of coal on it. It was safer than an ocean steamship in some ways.

But his order specifically stated that the cost must not be much, for after all the houseboat was merely a plaything for the children. The platform was made of rough second-hand lumber, but when covered by canvas and painted it made a smooth even deck. The next thing was to place upright posts along both sides, and to nail stout canvas overhead and along the sides. This made a canvas houseboat which was as watertight as any tent. The roof was made slanting, a ridge pole running the whole length, and two thicknesses of water-proof canvas covered it. Openings were left in the canvas for windows. Now here was a canvas houseboat built for the children at a total outlay of $40. The carpenter received a bonus for his skill and efficiency in designing it. The houseboat proved so attractive that the family often spent whole days on it with the children.

A modern houseboat of any pretensions requires today an upper deck covered with canvas where the owners can enjoy themselves on hot days. There is no space on the ordinary raft or scow for much deck room, and it is better to enclose practically all of the deck with boards and leave the upper deck for recreation. To accomplish this the floor of this upper deck, which forms the ceiling of the inside, must be laid on beams of sufficient strength to prevent any accident. The floor of the upper deck should be covered with canvas, oiled and painted, and a hand railing should be run around on all sides. Posts for supporting the overhead awning should be put up at each corner, and on large boats on the sides and ends too. This awning should be placed on poles which can be rolled up in times of heavy wind storms and tied snugly to the posts at one end. The entrance to the upper deck should be made from the outside by ladder or stairs. Cost is thus simplified, and nothing but plain carpentering work is needed.

The division of the inside into rooms and the furnishings are merely matters of detail. In small houseboats, two rooms should suffice, a living and sleeping room and a general kitchen and dining-room. Larger boats require two or three extra bedrooms, and some have as many as five and six. The interior is finished off entirely in the natural wood or painted. The cost of this depends upon the amount that is to be expended in the boat. Simple cottage furnishings such as we find in summer homes are the best suited for the houseboat, and if one is building it to rent these need not cost much. There should be added to the outfit two anchors, ropes and a pair of oars. Some include a sail so the houseboat can be moved to a new anchorage when the wind is favorable.

"Are you related to Barney O’Brien?" Thomas O’Brien was once asked.

"Very distantly," replied Thomas. "I was me mother’s first child—Barney was th’ sivinteenth."
Possibilities of the Steel Square
SHOWING HOW SOME DIFFICULT PROBLEMS MAY BE SOLVED BY MEANS OF THE STEEL SQUARE APPLIED IN A PRACTICAL WAY

Taking up the subject where we left off in the June number, we show in Fig. 255 how an elliptical figure may be drawn by the aid of the steel square, or by first laying off a right angle. By a system of lines, as shown, form the curve as indicated by the dotted line.

In this, it will be seen that the lines center at a point on one side of the angle equal to one-half of the short diameter, radiating to the other side and intersecting the same at double the space of the lines run from the other side of the angle. The intersections of these lines will give the points for the desired curve which, as will be seen by the illustration, forms one-half of the arch or one-fourth of an elliptical figure.

In Fig. 256 is shown a very useful illustration, of how the area of a third square may be made to equal that of two given squares with the aid of the steel square. This is found by letting the sides of the given squares represent the base and altitude of a right angle triangle. The hypothenuse of which will represent the length of the sides of the third square, which will equal the area of the given squares. In the illustration one of the squares is 12 by 12 inches and one 9 by 9 inches and one 15 by 15 inches. Now, by adding the areas of the two former, it will be found to equal 225, which is just the same as the area of the largest square.

The same proportion exists in the circle as well as in the above example, as will be seen by referring to Fig. 257. Here are three circles with diameters as follows: 12, 16 and 20. The centers of which begin at a, a, a. The rule for finding the area of a circle is—square the radius and multiply by 3.1416; which will give the area. Thus, the radius of the large circle being 10 its square will equal 100 and 100 times 3.1416 equals 314.16 inches. Proceed in like manner for the other circles and it will be found that the sum of the two will equal the above.
See the example worked out in figures in the illustration. The mathematical solution is only used here to prove the accuracy of the diagram. This is a practical example in more ways than one. Suppose a tinner wishes to turn two pipes of different size into one of equal area. This simple diagram will give the required size for the largest pipe without further figuring.

This calls to mind a costly error made by some parties engaged in putting in drain tile. They understood laying tile to a perfection and prided themselves on their work, but they did not understand how to find the areas or carrying capacity of the tile, and rather than ask some one that knew, they guessed at it. The starting point was at the juncture of two tile emptying into an open ditch and it was in this that the new tile was to be laid. Of course, the main or outlet tile should be at least equal in area at this point to the two emptying into it; but they did not understand how to calculate in figures, or the simple rule given above; and the result was they put in a tile much too small. It really should have been much larger further down the line to care for added territory.

Haste is made by going slow sometimes and certainly in this case haste coupled with ignorance made waste. In Fig. 258 is shown how the area of a square and circle may be approximately made to equal each other by the aid of the steel square. In the example is shown a square 12 by 12 inches which, of course, contains an area of 144 inches. Now to make a circle contain an equal amount, draw a line from 12 to 6% as shown. This line will represent the diameter of the circle and one-half of its length will be its radius. This proportion holds good for any size desired. It is shown here for a square foot, simply for illustration purposes. The point for a circle to equal a square of twice this base, or 24 inches, would be twice 6% or 134 inches.

How to Drive a Nail

The science of nail-driving is the subject of an article by W. D. Graves in a recent number of The Scientific American. Mr. Graves notes that the driving of a nail is usually deemed so simple a matter that inability to do the job typifies entire lack of mechanical ability; yet he believes that even skilled mechanics may have something to learn in regard to this elementary operation. He says:

"It usually takes a woodworker's apprentice a year or more to learn that he doesn't know how.

"A fledgling mechanic, who spoke sneeringly of a man whom he heard using several blows of the hammer to drive a shingle nail, was somewhat crestfallen when told that the nail would hold better when driven 'home' by several light taps, than when driven by one heavy one.

"'Why?,' he asked, in surprise.

"'Because,' said the other, 'when you drive a nail home with a heavy blow, it is apt to rebound a trifle, loosening the grip of the wood fibres on it. Drive it almost down, if you will, with as hard blows as you wish, but finish the job with several light blows.'

"One who thinks that the driving of a nail simply consists in getting the whole length of it out of sight, has little conception of the real nature of the operation. A nail driven by an expert will often hold several times as much as one ill-driven; while, too, it is often made to draw the parts into place. If you
have ever watched a mechanic driving nails, you have
doubtless noted that he rarely drives one at right
angles with the face of the work. There is a reason
for it. Suppose that he is nailing the ‘sheeting’ on
the frame of a building, and desires to draw the board
down tightly against the one below it; he points the
nail downward, and a few well considered blows at
the last produce the desired effect. If the board is
bent edgewise, so that much force is required, prob-
ably he will start the nail in the upper edge, pointing
very sharply downward. Again, two nails driven in
a board at different angles will hold it in place much
more firmly than the same nails would if they were
driven in at right angles with the face of the board.

"Did you ever notice that, in driving a nail in very
hard wood, one man will do it successfully, while
another succeeds only in doubling the nail up before
the point has fairly entered the wood? The difference
lies in the fact that the expert strikes the nail fairly,
and not too hard, ‘coaxing’ it in; while the other
strikes too hard and with indirection. It may be
profitably mentioned, right here, that in driving a nail
into very hard wood, it is usually profitable to dip the
end into oil or grease. This will not sensibly interfere
with the holding qualities of the nail, while it will very
materially facilitate its driving."

That a nail may hold firmly, the writer goes on to
say, the pieces it penetrates should be in close con-
tact. A few taps at the finish may serve to bring this
about; while a heavy blow often destroys it on ac-
count of the rebound. The direction in which a nail
goes is governed largely by the shape of the point. A
horse-shoe nail, by having a chisel point, may be made
to swerve and to come out of the hoof but little above
the shoe. By filing the point of a nail off on one side,
it may readily be made to take a curved course, or the
same result may be attained by bending the point slight-
ly with the claws of the hammer. Fig. 1 shows how
two boards may be secured, edge to edge, by nails
bent in this way. We read further:

"In driving a clinch nail, there is room for the exer-
cise of some skill. In Fig. 2 the central figure is that
of a clinch nail driven down into a hard surface, thus
being driven and clinched at the same operation. It
will be noted that it is bent in the middle, ‘crippled,’
thus loosened in the wood and deprived of much of
its holding capacity. At the left and right are nails
which were first driven through the wood, and had the
points bent over afterward, while a heavy hammer, or
the like, was held against the head. The one on the
left was carelessly bent, leaving a clinch which will
straighten easily; while the one at the right was first
bent over a trifle at the extreme point, then hammered
firmly down. By the latter method, it will be seen, the
point is driven into the wood, and thus more securely
held in place."

Regarding Stair Building
A correspondent asks regarding stair building how
the width of nosing additional to the width of tread
is determined.
Always make it correspond to the thickness of the
tread. If the thickness of the tread is 7/8 inch make
the projection of the tread beyond the face of the rise,
which is the “nosing” equal to it.
If the thickness of tread is 2 inches make the pro-
jection of the tread beyond the face of the riser 2
inches. This rule is generally followed by all experi-
enced stair builders and is recommended by authori-
ties on the art of stair building.

Effective Treatment
Asked the Progress Woman of the Beauty Cultur-
ist: “Don’t you think women should exercise the suf-
frage?”
"Certainly. My method will increase it two inches."
One of our subscribers, Mr. L. Werdin, of Deseronto, Ontario, has taken the Editors of the American Carpenter and Builder at their word. They have been urging the readers to send in suggestions and requests, to make this magazine their personal exchange for all practical ideas and information.

Mr. Werdin, in a recent letter, requests information concerning satisfactory greenhouse construction, especially the mill work details. This is an important matter of quite general interest. The designs here given have been in use in the building of hundreds of modern greenhouses by a prominent construction company that makes a specialty of this kind of work. They have been found durable and storm proof and thoroughly satisfactory.

It is conceded by all authorities that red cypress free from sapwood (which is the wood nearest to the bark), and air dried, resists indefinitely the attack of decay. The Encyclopaedia Britannica is authority for the statement that a pair of cypress doors in St. Peter's Cathedral at Rome were taken out in perfect condition after having done service for 1100 years. The same authority classes the American cedar as belonging to the cypress family, and the red wood as the connecting link between pine and cypress. However, everything considered, cypress is the most practicable and available wood for greenhouse work which, in the very nature of the case, furnishes about the severest test to the rot resisting properties of the wood.

Material with sapwood in it is one of the greatest dangers in greenhouse construction, and one most rigidly to be avoided. One sappy sash bar may cause...
more trouble and expense than the difference between
the cost of the highest and lowest grade material for
the entire house.
For wall and gutter supports posts are usually set
in the ground at least three feet and surrounded in
the ground with cement concrete, making the whole
about ten inches in diameter. When 16-foot lumber
is used the posts should be set 5 feet 2 inches from
center to center. Square gulf red heart cypress posts
are best; and when set in the above manner last an
indefinite length of time. When common round cedar
posts are used a slab is usually taken off on one side
so that a flat surface is gained to nail the sheathing to.
Iron pipe posts are set in concrete in the same manner,
and require a special cast-iron fitting at top for con-
s
necting to the gutter or wall plates. A good propor-
tion for the concrete is 1 parc cement, 2 parts sharp
sand, and 4 parts broken stone or gravel.
For the sheathing ship-lap is used, made either of
hemlock or pine 6 to 8 inches wide. The details show
a groove in the underside of gutters and wall plates
to receive this sheathing. The outside siding of any
kind is nailed on over the sheathing and should have
a tough waterproof paper well lapped placed between
it and the sheathing. The detail drawings show

special construction for side sash, stationary side glass,
and for the gable ends where glass and doors are
used. The door frames are made from 2-inch material
and run up to the gable rafter. Doors are usually
made 3 feet wide, 13½ inches thick and of height to
suit the house.
Proper ventilation is a very important factor in suc-
cessful green-house work. In top ventilation the sash
is hinged to the header and in bottom ventilation the
sash is hinged to the ridge. Details for both kinds are
given. It is largely a matter of individual preference
among growers which is used, but for vegetables, car-
nations and the hardy plants top ventilation is mostly
preferred, while bottom ventilation is usually used
for roses and such tender plants. Unless continuous ventilation is desired and ordered we would suggest that one row of glass be run to the ridge between each sash, thus giving a chance for the swelling of the sash to be taken up, also this arrangement admits of a freer circulation of air than is the case in continuous ventilation, as there is an opening at the end of each sash instead of only at the ends of the continuous row. The ventilating sash should preferably be as near 7 feet as the width of glass will permit, otherwise they will require too many lifters if small, or become unwieldy if much larger.

The best and most economical material for the construction of benches is pecky cypress. It is very rough looking and disappointing in its appearance, but being made of all heart cypress without sap has the lasting qualities of the best grade, and its pecky condition (which looks something like worm holes and decay) really is an advantage, as it aids in draining and does not impair its use for the purpose. All heart cypress for bench supports are almost everlasting.

Two systems of construction at the eaves are in general use. One furnishes a gutter to conduct the water away; the other allows it to drip, but at the same time protects the side walls. Details of both are shown, the latter being the simpler and less expensive.

**Bungalow Framing Details With Estimate**

**DESIGN AND CONSTRUCTION OF A TYPICAL BUNGALOW CORNICE WITH EXPOSED RAFTERS—HOW THE COSTS SHOULD BE FIGURED**

**By I. P. Hicks**

The bungalow style of building requires special designs and details of finish in order to carry out the work in a style that will be in harmony with the plan and general design.

The bungalow must have its extra-wide cornice to give it the bungalow appearance, and the rafter ends must also be of good material and dressed up smooth so that they can be properly finished. And, above all, it is always interesting to the contractor to know how to figure the cost of construction. There is probably no better way to figure a cornice than by the lineal foot, for if we have a plan it is comparatively easy to find the lineal feet of cornice required to cornice the building; then, if we know the number of square feet of some kinds of lumber and the lineal feet of other kinds, it is easy to arrive at either the cost of the material or the labor or both as may be desired.

First, we will estimate the value of the lumber per lineal foot of cornice. The projection of the cornice is 3 feet from the inside of the building. It is quite convenient as well as economical to make the plancher of 7%-inch flooring, nailed on to the rafters with smooth side down. The flooring should be either 5% or 3¾-inch face.

This cornice will require a plancher 3½ feet wide. Counting the amount of lumber lost in the matching of the boards and allowing for some waste in cutting, it will require 4 square feet of flooring per lineal foot of cornice, which at 4 cents per square foot would be 16 cents. The combined width of the frieze and fascia is about 2½ feet, which at 4 cents per square foot would make 10 cents per lineal foot of cornice. Summing the matter all up we have the cost as follows:

- Plancher: $0.16
- Frieze and fascia: .10
- Molding, No. 8142: .01
- Molding, No. 8018: .01¾
- Molding, No. 8020: .01¾

Total: $0.30

Thus we see that the material, figured at $40 per thousand, is worth 30 cents per lineal foot of cornice.

Now for the labor part estimated as near as possible at 40 cents per hour. To get at this in a practical manner it is about the best way to figure by the lineal foot at so much per member, charging a higher rate per foot for the larger members, such as the wide board in the frieze, for example.

We find that it would take 13 flooring boards of 3¾-inch face to make up the plancher; we will put these in at 1 cent a foot for each board, making:

- Flooring boards: $0.13
- Molding, No. 8020, per foot: .01
- Molding, No. 8142, per foot: .01
- Molding, No. 8018, which has to be cut in between every rafter, per foot: .02
- The fascia: .01
- The lower piece of frieze: .01½
- Upper piece of frieze cut in between rafters: .02½
- Wide part of frieze: .04

Total: $0.26

Thus we find the cost of labor to be 26 cents per lineal foot.

The gutter on the roof is best to estimate separate on account of there not being any gutter on some
sides; as across gables, for example. For the gutter we have only the back, end pieces and gutter brackets, if any are used. The back piece of gutter would only be worth about 2 cents per lineal foot, and the brackets about 1 cent each. The labor of putting in the wood work could be figured at 2 cents per lineal foot, making a total cost of 5 cents per lineal foot for lumber and labor. The lining of the gutter with a good quality of tin will cost about 12½ cents per lineal foot, making total cost of gutter for material and labor 17½ to 18 cents per lineal foot.

In the construction of the cornice the frieze and bed mold which cut in between the rafters should be put on first, that is before the plasterer is, then the latter can be nailed down from the top, making a thoroughly tight job. The board that goes between the rafters should be of just the right width, which is easier than to use a wide board and notch around the rafters.

Practical Garage Design

Perspective and Floor Plans of a Practical Garage of Very Neat Design and of a Size Most Frequently Desired

The accompanying design shows a garage, or automobile house, of a type very popular in the suburban towns. It is simple in arrangement and design, and so is inexpensive to build, yet it is very attractive in appearance.

The material to be used in its construction are: Exterior, cement plaster on wooden lath; interior, side walls and ceiling matched beaded ceiling over tarred building paper; floor, cement; and roof, shingles.

In size this garage is 30 by 24 feet. This is large enough to accommodate two large cars, with enough room to spare to permit of their being overhauled and cleaned.

The Pesky Almanac

Hayrix—Thar be one thing erbout them 'ere pesky almanacks I can't understand.

Mrs. Hayrix—What be that, Hiram?

Hayrix—Why'n tarnation don't they fix it so we kin hev a moon on dark nights when we need it, by grass?

Where He Slept

A prosperous farmer sent his son to New York to begin life as a clerk. After he had been in the metropolis for six months the farmer wrote the merchant to ascertain how his son was getting along and where he spent his nights. In due time the merchant sent a reply to the farmer which read:

"Your son sleeps in the store in the daytime. I don't know where he spends his nights."—The Circle.
A Beautiful Summer Cottage

PHOTOS OF BOTH INTERIOR AND EXTERIOR, TOGETHER WITH FLOOR PLANS OF A VERY ATTRACTIVE, WELL-DESIGNED SUMMER HOME

At Magnolia, in Massachusetts, is located the interesting summer home of Miss M. L. Bradford, which was designed by Messrs. Everitt & Mead, architects, of Boston. In appearance it strongly resembles the Colonial type of New England farmhouse. It stands back some little distance from the highway in the midst of sloping lawns, and against a background of fine old trees. The exterior finish is of shingle, left unstained.

A broad, uncovered veranda extends across the entire front of the house, and it connects at one end with the side veranda, which is roofed over. Large tubs of foliage plants and boxes filled with pink geraniums are placed at intervals about. A low hedge of Japanese barberry outlines the front lawn, and great clumps of shrubbery are planted at one side.
The interior finish is of cypress, planed, and stained a dull brown; no sheathing is used. The floors are all of polished hardwood.

The entrance door opens directly into the living-room, a cozy apartment, which connects at one end with the dining-room and kitchen. A massive fireplace, constructed of red brick laid in white mortar, occupies a prominent position at one side. To the right of the fireplace a flight of stairs ascends to the second floor, and just beneath is arranged a roomy clothes closet concealed behind curtains. A bow casement window at one side of the room overlooks the side veranda and commands an extended view of the main highway.

On the second floor are three chambers, a bathroom and linen closet, and in addition each room has a clothes closet and a set of drawers built into the wall under the sloping roof.

At present the house is suited only to summer occupancy, but it could easily be made an all-the-year-round home. The sloping ground at the rear of the house would permit of the construction of a cellar, or one could easily be built under the whole structure. With the walls plastered, a furnace installed and storm windows put on, the house would do for the winter.

Following is the estimated cost:

- Lumber ........................................ $800.00
- Carpenter work ............................... 600.00
- Painting and staining ....................... 150.00
- Hardware .................................... 100.00
- Plumbing .................................... 250.00
- Brickwork ................................... 100.00
- Total ......................................... $2,000.00
The Covered Porch—Bradford Cottage

The Living Room Showing Casement Windows
Summer Porch Furniture

FULL INSTRUCTIONS WITH WORKING DRAWINGS SHOWING HOW TO MAKE A SET OF CHAIRS AND A SETTEE FOR PORCH USE

PORCH furniture should be light of weight so that it can be moved in and out of doors as occasion requires. As far as possible the ordinary glue-joint construction should be avoided so that should sudden rains be blown upon it no great damage shall be done due to unusual swelling and subsequent shrinkage. Of course it is possible to go to extremes in this respect and build pieces so rough and rugged that they are suggestive of the barn or factory rather than the house. The accompanying designs show a fair proportioning of the two types of fastenings.

These pieces have seats of wood with slats interspaced for ventilation and properly shaped for comfort.

Whatever finish is used a water-proof final coat should be applied. Plain red oak is an appropriate wood and may suitably be finished with a dark Flemish stain and filler followed by a dull finish.

For the arm chair order the following:

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<thead>
<tr>
<th>No.</th>
<th>Thick</th>
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<tr>
<td></td>
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<td>In.</td>
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<tr>
<td>Front verticals</td>
<td>2</td>
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<td>Back verticals</td>
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<tr>
<td>Bases</td>
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<tr>
<td>Side rails</td>
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<tr>
<td>Braces under arms</td>
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<tr>
<td>Seat</td>
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<td>Cleats</td>
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There will also be needed sixteen wood bolts, with nuts and washers 3/4 inch by 2 inches, and four machine bolts 3/4 by 3 inches.

Next prepare the bases. These shapes are rather unusual and it may be well to make paper patterns or templates of thin wood to be used in laying them out.

The side rails are plain except the front ends, which are rounded. These are to be 3/4 by 3\% by 24 inches, with the 3/4-inch bit bore the holes for the bolts which are to fasten the sides together. Bolt together the two sides of the chair.

Slope the arms as shown in the drawing and fasten them in place after having cut the tops of the front verticals to shape. To get this slope, hold the arm at the proper angle and alongside the verticals at the proper height and mark under the arm upon the vertical with a pencil or knife. Dowels and glue are to be used to fasten the arms to the verticals. The position of the chair arm is somewhat out of the ordinary,
the idea being to give the arm of the occupant an easy position away from the body.

It should be noted that the front end of the arm of the chair is not cut at a right angle to the inside edge of the chair as are most chair arms, but is cut at an angle such as will bring the front edge parallel to the front of the chair.

Shape the braces and fasten them in place under the arms, using dowels and glue.

Now prepare the rails for front and back. The front rail is to be 33/4 inches wide at the ends, the lower edge being curved at such a radius as to give 3 inches at the middle of the piece. The corresponding rear rail is similarly shaped. Its length, however, is only 18¼ inches between the posts while that of the front is 20½ inches. This difference in length will necessitate cutting either the sides of the mortises or of the tenons of the front and back rails at a slight angle, also the shoulders of the tenons.

The tenons to be used on these and the rest of the back rails are what are known as stub tenons. Since the thickness of the pieces into which they enter is only 3/8 of an inch, these tenons can be only about 3/4 inch long.

Cut the tenons and mortises; then shape the edges of the back rails. These rails are curved on the edges only—they are not curved the flat way as are most chairs. The radius for each is 26 inches. The tenons might have been cut after the curves were shaped. However, by laying out the curves, then cutting the tenons before the curves no confusion as to the proper location of the tenons need arise.

The front and back rails to which the seat is to be fastened are to be secured to the verticals by means of draw-bolts, the 3-inch machine bolts being used for this purpose. The boring for the nuts that are to enter the rails will be done on the inner surfaces of the rails, of course. The rest of the tenons, as well as the ones to be draw-bolted, are to be thoroughly glued and clamped.

It will be noted that the top edges of the front and back rails are to be beveled so that the seat slats shall fit them properly, also the top edges of the cleats.

These slats are shaped by steaming the wood, then clamping them to forms previously worked to the desired shape, as shown in the drawing. Fix up a steam box as follows: Nail four pieces of boards together so as to make a steamtight box of a size sufficient to take in the slats to be shaped. Close one end of the box, boring a hole in it large enough to take in the end of a piece of iron pipe or a garden hose. Put the pieces in this box, connect the box to some steam-producing vessel—a tea kettle would do—using a piece
of hose, and stuff rags in the open end of the box. Allow the pieces to remain until they are thoroughly saturated with moisture and are pliable, then take them out and clamp them to the forms. Allow them to remain on the forms until the wood has dried out enough to hold the form of the model.

**SIDE CHAIR**

The Side Chair

The construction of the side chair is along the same lines as the two just described. The proportions are

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The Settee

The settee which is shown is so similar in the manner of its construction that no additional drawing is needed for it. The ends of the settee are exactly like those of the chair. The length of the front rail is 41 inches, measuring from the inside of one post to the inside of the other. The back rail is 39 inches long from inside to inside. Fourteen slats will be needed for the bottom. The back horizontals and the cleats to which the seat is to be fastened must be made correspondingly longer. The curvature of these back rails is of the same radius as for the chair for the same length of horizontal. The intervening part of the horizontals is straight, as will be seen in the picture.

**MILL BILL FOR THE SETTEE.**

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<td>Arms</td>
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<tr>
<td>Braces under arms</td>
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<tr>
<td>Seat</td>
<td>14</td>
</tr>
<tr>
<td>Cleats</td>
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Bolts as for the arm chair will be needed.

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Thoroughly scrape and sandpaper all the parts preparatory to applying the finish. The bottom pieces are made fast to the cleats and these in turn fastened to the front and back rails. The sides of the chair are assembled first, then the back and front rails glued up, and finally the seat is put on.
different and the seat is put on differently. The radius of the seat slats is 24 inches. They are fastened to the chair rails by means of small-headed nails. These heads are set below the surface of the wood slightly and the holes are to be filled with a putty colored to match the finish.

No rocking chair has been described in this set of porch furniture. The manner in which either the arm or side chair can be made into rockers is very evident, the making of rockers and their substitution for the present bases accomplishing this result. The bolts which fasten the bases to the verticals make it possible to change from one kind to another quickly.

### MILL BILL FOR THE SIDE CHAIR

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<td>Back rail</td>
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</tr>
<tr>
<td>Seat</td>
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The bolts needed are the same as for the other chair.

### Pressed Steel vs. Cast Iron Radiation

A PAPER PRESENTED BEFORE THE AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS

AND DISCUSSING A SUBJECT OF MUCH INTEREST TO BUILDERS

By Ray D. Lillibridge

NOTWITHSTANDING the obvious advantages of sheet-metal radiation in the way of reduced weight, reduced space occupied, facility of handling, and ability to withstand, without injury, the freezing of contained water, there prevails in some quarters the general impression that this new form of radiation also possesses inherent defects which render it unworthy of consideration as a substitute for cast-iron radiation. This impression is due, perhaps, in no small measure to the adroitly conducted “Campaign of Discouragement” that has been directed against this new thing—as comprehensive and systematic a campaign as was ever directed against any innovation, the advent of which threatened the commercial supremacy of the interests occupying a chosen field.

Such opposition and obstacles are not unusual. It was so with the railroad, with the automatic harvester, with the telegraph, the telephone, etc. It was so with steel itself. Benjamin Huntsman, the inventor of the process that produced the world’s steel up to the invention of Henry Bessemer, found difficulty in introducing his product in his own country, owing to the conservatism of the Sheffield cutlers, who “perversely declined to work a metal so much harder and denser than any to which they had been accustomed, so that he was compelled to introduce his product, which was destined to revolutionize steel making, through a foreign market.”

But, as in the case of those great inventions, it is also to be expected that the hindrances put in the way of the new form of radiation will be ineffective in the end; since anything of the kind of genuine merit, if properly exploited, cannot long be prevented in this age of progress from coming to its own. Now that this particular new thing has survived the vicissitudes of the experimental stage, and has entered upon a career of commercial success, it may prove advantageous to point out the fallacy of some of the arguments advanced against it. A permanent record of the discussion of the subject may also be of value for future reference.

The durability and efficiency of the new form of radiation have been assailed particularly. Dire predictions have been made as to the short life of the thin steel walls of the pressed radiation as compared with the thick walls of the cast-iron type. Ominous comparisons have issued, of which, perhaps, the one most often heard is that likening the pressed radiator to the steel kitchen boiler, which has proved to be comparatively short lived. Finally, on the subject of efficiency, ignoring the more than compensating virtue of a thin metal wall versus a thick one, capital has been made out of the theory that steel has a slightly lower radiating power than iron.

If we are going to discuss the vulnerability of steel to the corrosive impurities of water in radiating systems, one has but to refer to the steel nipple connecting the sections of the cast-iron radiators, which are located in the direct path of all circulation, to call to attention that the cast-iron chain is no stronger, at the point of its weakest link, than steel. The screw nipple used between sections of cast-iron radiators is of much smaller cross-section, especially after threading, than the 20-gage (16-gage after galvanizing) steel radiator. As for push nipples, these as regards durability are about on a par with the walls of pressed radiators, except that the many that have come under the writer’s observation were either not galvanized at all or the galvanizing was decidedly scant. Or, why not refer to the steel pipe connections, which are similarly weakened by threading (Fig. 1), but which are as integral a part of the radiator system as the radiators themselves? In both the screw nipples and pipe connections, not only is the material pared down, but the galvanizing, if any, is removed by the threading; so that these elements are far more liable to be eaten away than is the continuous, well-galvanized sheet metal of the pressed radiator.

Consider further the small quarter-inch pipe commonly used with vacuum systems and compare the thinness of the wall of this quarter-inch pipe, especially after cutting the threads, with the thickness of the
pressed radiator wall. Moreover, it is seldom that these pipes have any interior protective coating. Think of the trouble that would arise with vacuum systems if these little pipes should fail from corrosion. As this consideration seems to arouse no anxiety, is it logical to condemn on the same score the pressed radiator?

It is safe to say that a very small proportion of the pipe used for connecting radiators is really wrought iron, although “wrought-iron pipe” is usually specified. Although Mr. T. N. Thomson’s paper before this society last January has led to much discussion, no one has questioned his observation that of the samples sent to him from all over the country of “good old wrought-iron pipe,” 80 per cent. proved to be steel. At the recent Atlantic City meeting of the American Society for Testing Materials, Professors Howe and Stoughton outline corroborative testimony of a most convincing character. Incidentally, Mr. Thomson’s tests, concluding that steel withstands better the corrosive impurities of water than wrought-iron, are more than substantiated by Professors Howe and Stoughton’s conclusions. I beg to quote you just a paragraph from the latter. The italics are mine:

“It is found that * * * the wrought-iron skelp, though from the best makers, pitted in seven months much deeper than the steel did in thirteen months. It seems to us that the fairest way is to confine our attention to the deepest pit in each plate, because, as well as we have said before this Society, if there is a hole the water will run out, no matter how much the pipe weighs. Using thus the deepest pit in each piece, as a basis of comparison, in our tests the steel pitted very much less than the wrought-iron.”

The comparison of the pressed radiator with the kitchen boiler for durability is particularly inconsistent for the reason that the very service of the kitchen boiler insures that the water is constantly changed, and the effect of any contained corroding agent is thereby multiplied thousands of times as compared with the corroding effect in a closed-circuit radiating system. Moreover, the majority of kitchen boilers are made of inferior grades of steel, and actual investigation has shown that the galvanizing they receive upon the inside is often of the proverbial “lick-and-promise” type; whereas pressed radiators are made of the very best open-hearth sheets, low in phosphorous, carbon and sulphur, and after manufacture are galvanized with a coating of 4½ ounces of zinc to the square foot, increasing their effective thickness from 20 gage to 16 gage.

On the subject of efficiency, the original form of pressed radiation was defective because of the peculiarly shaped top to each section, which interfered with the free circulation of the air and, in the light of more recent knowledge, insufficient space was allowed between the sections. This peculiarly shaped top is shown in the left-hand illustration, Fig. 2, which is a vertical section of the old pressed radiator. The two right-hand illustrations of this figure show, respectively, a section of pressed radiation with the single seam, and with the double seam as now manufactured, respectively. This improved double seam gives an entirely impervious joint.

As for the maintained superior radiating efficiency of cast-iron as compared with steel, Professor Carpenter, Professor Kent, Professor Allen, Mr. W. T. Monroe, M. E., and the many references quoted by these authorities incline to agree that the differences appearing between the radiating efficiency of various metals are due more to differences in surfaces, differences in size and shapes of the radiators tested, and to different methods of test, than to differences in metal. I beg to quote from Professor Carpenter’s “Conclusions from Radiator Tests” (page 112, Heating and Ventilating Buildings):

“The experiments do not show any sensible difference for different materials used in radiators, or for hot water or steam, provided the difference in temperature between the air in the room and that of the fluid in the radiator is the same.”

A favorite implication of some of the exponents of cast-iron is that pressed radiation is from “30 to 40 per cent. less efficient.” The really vital test for any radiation is that of heating the particular room it is designed to heat. The calculating of the appropriate size of radiator from which to expect the adequate heating of a given room is sufficiently standardized so that any type of radiator failing so far short of the
radiating capacity of cast-iron could not continue to live in the heating world. It is conservative to say that pressed radiation continues to live after six years of existence. Is it not, therefore, abundantly clear that the practical differences between the radiating efficiency of steel and iron resolve themselves into mere talking points, and that any references to vague and indefinite tests that show to the contrary should not go unchallenged?

Comparative tests, to be of value, should be conducted by disinterested people and under specified, uniform conditions. It is too often taken for granted that the entering steam is "dry," whereas only calorimeter readings should be considered competent to determine this point. When even under such conditions differences do appear, it is well to bear in mind that great differences exist by condensation tests between the efficiency of different types of cast-iron radiation. For instance, I refer to tests conducted by Professor Allen at the University of Michigan, showing a difference of 16 per cent. between two popular types of cast-iron radiators. I have also in mind the test which decided in favor of pressed radiators one of the most important installations of radiators in the world. This test was conducted by a committee consisting of the architect's engineer, the building engineer, the consulting engineers of the builders, and the contracting steam fitter. It is noteworthy that the conclusions reached were not based upon condensation, but upon the heat units conveyed to the atmosphere by the respective radiators under identical conditions.

Judging by various published tables and the extensive adoption of one-inch pipe for radiator service prior to the advent of cast-iron radiators, the most efficient proportion between containing capacity and heating surface of radiation is that of the one-inch pipe, very nearly one pint to the square foot. The average proportion with the steel radiator is just about one pint to the square foot, whereas cast-iron radiators average about 50 per cent. greater. Besides this nearer approach to the ideal proportion of capacity to surface, there is less water and steam and far less metal to raise to the working temperature before effective heating is available, and to remain heated after the discontinuance of heat is desired; so that pressed radiators heat up more quickly when the valve is open and cool off more quickly when the valve is closed than cast-iron radiators. This positiveness of operation becomes an especially valuable consideration when heat is needed only for an hour or so a day—as in the spring and fall, when a little heat is required to take the chill out of the air, and during the mild winters that prevail in certain parts of the country.

Another argument advanced in favor of the cast-iron radiators as against the steel radiator is that the sections of the former possess all the advantages of individual units. For example, if they are broken they can be replaced, or, if it is desired to decrease or increase the size of a given radiator, one or more sections can be removed or added, respectively. The comparative unwieldiness of the cast-iron radiator, and the formidable task of prying apart and pushing together the predominating type of iron radiators having push nipples, however, are material points against the unit argument, which more than offset the advantages. It will usually prove cheaper, cleaner, and quicker, to send for a new pressed radiator than to tamper with the sections of a cast-iron one.

The personal equation, unconscious bias, or mere conservatism naturally enter into any consideration of this new subject as they enter into all others. So, when you hear of failures of steel radiators, it may be well for you to know instances that give testimony on the other side. For example, there are several concerns of heating contractors which have made many large installations of the pressed type of radiator who today declare that they would consider it a great misfortune if they were deprived of this new form of radiation.

As with anything new, more is expected of pressed radiation than of the older types. The same defects or troubles which would condemn the new are accepted as matters of course when they occur in the old. Job for job or radiator for radiator, it will be found to be absolutely true that with the pressed radiators as they are made today no more trouble develops than with cast-iron radiators.

Copper for Steam Pipes

In a recent lecture before the Institute of Marine Engineers of London, Eng., J. T. Milton, chief engineer of Lloyd's Register, made an interesting declaration on the use of copper for steam pipes. Speaking on this point, he said:

"Copper is valuable for steam pipes chiefly on account of its ductility, its ability to withstand considerable repetitions of changes of form, and its non-liability to rust. Ordinary copper contains a proportion of impurities such as arsenic, bismuth, antimony, lead and other metals, but by electrical deposition it is possible to obtain pure copper. The latter is especially useful for electrical purposes by reason of its high conductivity. Impurities affect the conductivity to a great extent. The presence of bismuth in copper is exceedingly deleterious, one part in 1,000 rendering the copper useless for important works, as at high temperatures its strength is reduced, and the copper becomes very brittle.

"Impurities in copper, when in small quantities, on the whole have a good effect for most purposes, and the recent British Admiralty tests allowed 0.7 per cent for these. In making sheet copper it is cast in slabs and first rolled when hot. Subsequent thicknesses are rolled cold, and the quality of the copper depends to a great extent on the amount of work put upon it in undergoing this process."
Library Building of Unique Design

PERSPECTIVE AND PLAN OF AN ATTRACTIVE WELL-ARRANGED LIBRARY BUILDING—A STRIKING EXAMPLE OF L'ART, NOUVEAU OR THE STRAIGHT-LINE STYLE

In recent years it has become quite the usual and expected thing for every village and town to have its public library building. In fact, the library has come to rank in the popular mind well up with the public schools as an educator. So village councils appropriate funds for the erection and maintenance of the public library just the same as for other educational work.

The building itself, which is to house the library, deserves considerable attention. It need not be over large; yet it should be substantially built, and so designed as to be dignified and individual in appearance.

The accompanying perspective and floor plan show a small library building recently designed by Geo. W. Ashby, architect. It is rather striking in appearance, and is a thoroughly good arrangement and design. The materials are smooth-faced concrete blocks, buff colored brick and terra cotta trimmings. The interior arrangement gives a large well-lighted space for book stacks. The floor plan shown on the next page makes this clear and shows other desirable features in the arrangement of this building.

New Method of House Framing

I have been thinking for some time about writing an article for the American Carpenter and Builder, but have been unable to find what I thought would be a suitable subject, but I think I have found it at last and I think that any wide-awake reader of this magazine will readily catch my ideas and absorb the benefits which I am aiming at along this line of construction.

My idea is in the building of a 2-story house, to build one story at a time and thus save material and make the building stronger and better. I, myself, as a carpenter, have worked on all kinds of work, some on which my idea was partially carried out, but where a great deal more material was used than was really necessary.

Now since nearly every contractor has adopted
nearly the same method of construction for the first floor, namely, "putting on joist box sills and laying sheathing floor before raising any of the framework." I will start my article from this point. In most all the work that I ever worked on, the floor plate was first spiked to the floor. I think there is a better way, and that is by laying both bottom and top plate at the same time and then spiking the whole side together, including floor plate, before raising. By so doing the spikes are driven through the floor plate into the

studding and thus do away with all that toe-nailing of the studding to the floor plate.

Now then we must deal with the length of the studding. First, it must be considered that all floor joist on the same floor should run in the same direction. All partitions of the first story, both interior and exterior, running the crossway of the floor joists above will be bearing partitions, and must be framed to make the right height for the ceiling; and the non-bearing partitions should be framed the width of the joist higher and thus catch the second story floor, saving a joist and making the floor bear directly upon the partitions. Then on the exterior wall a plate 2 inches wider than the stud should be used, so as to catch the floor past the studs; and on interior walls, that continuing on up should have a plate 4 inches wider than the studs. Let this extend 2 inches on each side of the partition. Then it remains to nail a strip across the studs, to catch the ends of the lath, even with the bottom of the joist.

I think this method of construction has many advantages over any other, most of all is the convenience of putting in heat stacks for hot air furnaces. You can bring a stack up between two studding and turn the stack to one side and place a floor register without the least bit of cutting; or if there is a jog between the lower and upper partitions the same will hold good with the exception of cutting the foot plate of the upper partition to place a wall register. All studding set over bearing partitions should run clear down on the plate of the bearing partition and be spiked onto the sides of the joist. Studding set over the longitudinal partitions must be set on top of plate and toe-nailed. If the well hole in a building of this kind comes to the outside wall the exterior wall studding should run up the full two stories.

While I believe I have explained very thoroughly my ideas along this line I think that anyone should try this method through on a job. Then he would understand it and would like it so much better that he would never change back to the old way.

W. A. CALDWELL.

Irish Wit

A young member of the House of Commons who had just made his maiden speech sat upon his new silk hat. There were roars of laughter. An Irish member immediately arose and gravely said: "Mr. Speaker, permit me to congratulate the honorable gentleman upon the happy circumstance that when he sat on his hat his head was not in it!"
Attractive Modern House Plans

FULL WORKING DRAWINGS INCLUDING ELEVATIONS, FLOOR PLANS, AND DETAILS OF CONSTRUCTION AND FINISH OF AN ATTRACTIVE MODERN HOUSE

We present this month a complete set of architect's drawing of a modern 8-room house, just as it was designed and built for Mr. E. C. Brown, of Lake Mills, Wis. These drawings, made to a quarter-inch scale, have been reduced to practically one-eighth inch to the foot. They will be studied with a good deal of interest by carpenters and builders.

This house is a combination structure, standard wood framing, with 4-inch brick veneered first story and with the second story surfaced with cement plaster and divided into panels with exposed timbers. This makes a very warm and substantial construction and presents a very neat and stylish appearance. The bricks used in Mr. Brown's house were the dark brown, dull finished bricks, and the exposed timbers and wood trim of the second story and cornice were stained a similar color. The cement plaster, applied with a rough pebble-dash finish was left the natural gray in color.

The interior arrangement of this house is all that could be desired. The rooms are large and well-lighted; not at all cramped or stuffy, yet very cozy and homelike. The house builder can get a good many valuable ideas from these plans concerning the built-in fixtures; cupboards, bookcases, mantels, consoles, closets, etc., which are now so much in demand for first-class residences. The floor plans show where these are located and the detailed drawings show their construction.
New Style of House Design

One of the most recent additions to American residence styles and one that is giving much popularity is the chalet. While it is distinctly a novelty in the United States, it would be wholly incorrect to represent this unique type of dwelling as an innovation in the prescribed limits of that little republic ever since—or, rather, until the recent date when Yankee architectural explorers discovered its possibilities.
The chalet attains its artistic perfection by the most simple forms of architectural expression. The principal details of construction are emphasized to produce a decorative effect. The floor beams are usually prominent; the chimneys are monumental, and the windows are conspicuous—nothing being in any sense hidden or masked. In other words all the decoration belongs to the building itself; is not added as an afterthought, so to speak.

The feature of the chalet which more than any other impresses a person beholding one of these houses for the first time is the distinctive and conspicuous design of the roof. The roof advances considerably on the

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**Second Floor Plan**

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rent, and show the division of the building into stories, and this demarkation is often emphasized by a carved decoration.

Following the same novel architectural policy, the brackets that support the roof of the chalet are enor-
front—from 4 to 10 feet in most instances—and on the sides of the house it extends widely. The protection thus afforded induces balconies or galleries as the natural adjunct of this type of residence. In Switzerland the balconies are on the sides rather than on the front of the house, but in the Americanized version of the chalet the reverse is often true.

Chalet roofs are of two different patterns, which markedly affect the whole appearance of the individual house. These differing designs of roofs have been adopted indiscriminately in America, but in Switzerland, where they originated, they were adapted to different climates. The high, steep roof was the approved shelter for the chalet of the plains or valleys,
its construction having been planned to allow water
to run off rapidly.
In contrast to this is the mountain chalet, designed,
originally, for a country where snow is of heavy and
recent issue of the *Journal of the Society of Chemical
Industry*. It is made by grinding six parts by weight
of calcined red brick clay with ten parts of Portland
cement clinker, and is known as "red cement." Tests

of frequent occurrence. This variety of chalet has a
broad, low roof, so that the snow may accumulate on
it and protect the house from the exceeding cold of
the winter. Even in Switzerland, however, these two
standard types have been varied infinitely.

### A Cement to Resist Sea Water
A cement for resisting sea water was described in a

of briquettes immersed in fresh and sea water for
periods up to ten years show, Mr. Potter states, that
while Portland cement decreases in strength in sea
water, red cement, on the other hand, increases in
strength. Both red and Portland cement increase in
strength in fresh water, the latter in the larger ratio.
Over 5,000 tons of red cement have already been used
in sea and fresh water, and the results are said by
Mr. Potter to be satisfactory.

An Irishman who fished continuously for forty-nine
years, is dead, but the stories he left will live after
him, forever.
A Molder for the Small Shop

WILL IT PAY TO INSTALL A MOLDER IN YOUR SMALL WOODWORKING OR CONTRACTOR'S SHOP?

PRACTICAL CONSIDERATIONS INVOLVED

By W. D. Graves

The molder, or sticker, is such a useful and all-important machine to the planing mill man, and in our larger woodworking establishments, that the question is frequently up before their smaller brothers of the woodworking and contractor's shops to see if they, too, might not install this machine to good advantage, both to business and to pocketbook.

Now there are, of course, vital considerations on both sides; but let it be said right at the beginning that the molder is a machine which would prove profitable to comparatively few contractors or carpenter-shop men. True, the price of moldings, when compared with the price of lumber, indicates a pretty stiff price for ripping and sticking; but one must consider the cost of the machine, as well as that of the knives and of setting up. As one must have a complete set of knives for, practically, each pattern of molding, one must needs run quite a quantity of each such style before the knife cost becomes negligible; and it doesn't pay to set up for a pattern unless quite a quantity is run at one time. It takes a high-priced man an appreciable time, or a cheap man a long, long time to set up a machine for even the simplest molding.

The writer has often had builders ask him to run a short piece of some odd style of molding—styles for which there was no likelihood of further demand—to be used in repair jobs; but they usually "fade away" when asked to pay a fair price for making special knives. It is usually much cheaper to work such a piece by hand than to make knives and set up the machine for it. If a man cannot be found who has the needful tools and ability, some makeshift had better be resorted to; or the whole of the old work renewed in some stock style. The making of special moldings, to architect's designs, does not usually pay any more than is due to the skill and time required for so doing—scant that, unless the quantity is large. The making of a good molder knife calls for no small degree of skill and time; besides the cost of the blanks.

One is apt to consider the edging pile a basis for the purchase of a molder; but he should beware of giving it too much weight. Edgings, and good edgings, too, have to accumulate very fast, indeed, in order to amount to much as food for a molder. The chances are that the strips are worth more for kindling, and that any attempt to make moldings of them would simply be a very expensive way of depreciating the value of good fuel. The stock for moldings must be of the best—for a slight defect in the strip is apt to be a mighty big one in the finished molding—and an attempt to work up defective stock, with a view to cutting out the defects, is sure to be expensive economy.

For those who have sufficient outlet for the product, however, there is perhaps no more profitable machine than a molder; but, as the machine represents quite an initial investment, and requires considerable power, one should be reasonably sure of that outlet before investing. When one gets a molder he is getting into machinery "as is machinery"; and it behooves him to "bally well know" what he is about, before he invests.

Even more than is the case with other machinery, one must be on his guard against getting a molder too light for the work. Weight and rigidity, even where their necessity may not be plainly apparent, are well worth while. In the molder we have several cutting members which, to use a printer's term, must "register," and any spring, jar or give is practically sure to be detrimental to the work. I say several cutting parts, because it is assumed that no one will think of buying a machine to work less than four sides; unless for some special form of work. Also, one doesn't want any "old trap," "almost as good as new;" for, however delightful it may be to tinker one up and make it do good work, it doesn't pay. Some men can do pretty good work on very "bum" machines; but, as a general rule, they don't earn their salt while doing it. At the same time they are making themselves worse insurance risks than Indian fighters, and with no pension in prospect.

It is beyond the scope of this article—if not beyond the ability of the writer—to give even approximately adequate instructions in the use of a molder. The man who installs such a machine should figure on employing a competent man to run it, and on paying him the price of highly skilled labor. Such a man must not
only be well informed as to the practice of machine operation generally, but he must know how to lay out and grind knives. It would be well, too, that he should know how to temper them, and have a forge for that purpose; for "the village blacksmith" is unlikely to be good at tempering now-a-days.

Of course any man of mechanical bent can soon learn to set up a molder, and under average conditions it takes no very high order of skill to run it. On the other hand, to set up quickly and to run the machine with the greatest economy of time and material, under all conditions, requires as much talent and training as any trade, in the old time sense of that term.

A molder must have ample power in order to do at all pleasing work, and the manufacturer's statement of the power requirements of his machine may usually be doubled without any serious danger of getting too much. It is quite essential to the accomplishment of good work that the speed be high and constant. In order that it may be so, one must have sufficient power to drive dull knives through the toughest and most ill-prepared stock. It is not meant by this that one should run dull knives, nor be careless in the preparation of the stock, but that he should have reserve power enough to cover emergencies. He should, of course, make these emergencies as rare as possible.

Good work can be expected only from sharp and well fitted knives, firmly and correctly set on a well-balanced and close-running head. From the nature of the work the knives must often project quite a distance, causing a severe strain on them, and on the bolts which hold them. As a knife or nut hurled from a cylinder making several thousand revolutions per minute, is apt to cause acute irritation of any part of the human body in which it may find lodgment, it is the best of policy to keep them strictly confined to their proper places. In order that they may be so kept they must be of the best; and should be placed by a man of judgment and "know how." There is a certain subtle sense of touch, incapable of designation except by the terms "know how" or "feel" (and they would designate it only to the initiated) which warns one when a bolt is as tight as it may be without over strain. This sense one must have before he can safely operate a molder, for the bolts will be called upon to hold all that is possible for them. Also, one must know how to have the knives fit the face of the cylinder accurately and closely; for, if there is the slightest opening between them, the shavings will drive in sufficiently to break the strongest bolt that can be used. There is room for the exercise of a deal of judgment and skill in the setting of knives to the best advantage; judgment and skill attainable in a high degree only by considerable study and practice.

Volumes might be written, and have been written on the operation of molding machines, and the tyro should, by all means, read as many of these as may be before attempting to run one. If such reading is supplemented by lessons from a practical operator, so much the better. One may "pick up the trade," but that is sure to be an expensive way to acquire it. A molder, when one has the market for its product, is a valuable machine; but it is not one well calculated solely to work up odds and ends, or to occupy the spare moments of the hired man.

Fire Protection For Mill

A correspondent writing in the American Miller tells of a fire-fighting arrangement which could be used in many wood-working shops to very good advantage. A miller taking charge of a mill noticed piled up with the scrap in the basement an accumulation of fifteen or twenty oil barrels. These were in a condition to invite a fire in the near future by spontaneous combustion. Permission was granted to make use of these barrels to reduce the fire hazard. All barrels were tested to make sure they would hold water and then three were placed one upon the other, putting two 4-inch blocks of wood between them, and connecting the barrels with 2-inch gas pipe, making a water-tight connection between the three barrels. A set of three barrels was placed in each corner of the upper story of the mill. A pipe with a valve and proper connections for a garden hose was fitted in the bottom end of each lowest barrel. A hole was bored through the floor and a hose attached for use on the floor below. This gave ample pressure for protection from fire in its first stages, and is a long way ahead of pails and one barrel of water. Where a slight pressure can be brought to bear on an incipient fire, it soon can be brought under control.

Just in Time

A German shoemaker left the gas turned on in his shop one night, and upon arriving in the morning struck a match to light it. There was a terrific explosion, and the shoemaker was blown out through the door almost to the middle of the street. A passerby rushed to his assistance and, after helping him to arise, inquired if he was injured.

The little German gazed in at his place of business, which was now burning quite briskly, and said:

"No, I aindt hurt. But I got out shust in time, eh?"

It takes a live fish to swim upstream. Any old lobster can float down.
Small Dairy Barn

FULL DRAWINGS OF WELL-LAIRED-OUT DAIRY BARN OF SMALL SIZE SHOWING INTERIOR ARRANGEMENT AND SIZES OF THE DIFFERENT PARTS

Plans for a very neat and serviceable dairy barn are shown herewith. It is a gambrel roof barn, 42 by 53 feet, giving stable room for 22 milch cows, 2 horses and box stalls for bull, calves, etc. There is also good space for wagons, implements, feed, etc. There is a silo connected with the cattle feed alley. Large hay storage space is provided.
**Athens to Be Remodeled**

Athens, historic capital of grace and beauty, is to be remade in Germany. Herr Ludwig Hoffman, architect of the city of Berlin, has been commissioned to map out a scheme for the architectural regeneration of the ancient Greek metropolis. He has just returned from a visit of inspection to Athens.

The local authorities, with whom he conferred there, appear to desire to remodel their city upon modern European lines, with a system of parks, boulevards, public buildings, which will combine to make it more attractive as a tourist center. This Herr Hoffman hopes to accomplish, while still retaining the best examples of ancient classic architecture, of which Athens contains a multitude.

One of the projects upon which the Berlin builder sculptor. Although the design has already received first prize from the Athens municipal council, Herr Hoffman hopes to induce them to abandon the idea of erecting it.
Rocky Mountain Timber Worm

To the Editor: Florence, Mont.

An item printed a short time ago, in regard to the ravages of worms in west coast timber, recalls a life size photo which I took of a similar, if not the same, worm, found in some dead timber in the Rocky mountains. This worm, to one not versed in entomology, looks the same as the smaller one which is common wherever pine grows; but it is as large as a man's finger.

Although I have not been able, as yet, to prove the connection, the bug which appears to be its probable progenitor and ultimation is a nocturnal one, in evidence in the early summer months. It is nearly as large as a small bat—nearly as long, but much more slender—and has a couple of antennae like small darning needles built into the upper part of its head. It looks as though it might be a cross, in miniature, between a bat and a Texas steer. They are often quite plentiful in the pine woods of a June night, and fly about as if with no object but to butt against something; like an animated and sportive rubber ball. One wakened, for the first time, by their striking against his tent, and seeing their moon-cast shadows on the canvas, might easily be pardoned for pulling his head under the blankets.

I once enclosed one in a stout mailing case and directed it to a friend in the east. My friend notified me that he got the case, empty, with a large hole gnawed in it. At about the same time a news item stated that a mail clerk, running into Boston, had suddenly died of heart failure. I hope that there was no connection between the two incidents; but, if that bug appeared to that young man on the morning after a convivial evening, I'm afraid that I was indirectly responsible for his death. The bug is harmless, except to dead pine timber; but an unexpected first view of it might well be debilitating.

W. D. Graves.

Wood vs. Metal Lath

To the Editor: Henderson, Ky.

Noticing the inquiry of W. H. Benson about the best way to plaster the outside of his house, I would warn him against the use of wood lath. I had an out-building plastered that way and in less than two years had to do it over again as the cement became loose in places and in other spots I found the lath had rotted away. The lath we buy now is all sap and bark, and absorbs moisture like a sponge. I used expanded metal lath the last time and think I will have no further trouble as I heard of a job of that kind which is in good condition after being up for nine years. I used some lime on first coat, enough to make a paste.

G. W. Edegling.

Framing for Cement Roof

To the Editor: Ohlman, Ill.

I wish a little advice if you please; I am going to build a building 32 by 60 feet, 24 feet high, out of concrete blocks; would like to put concrete on same if it can be done. Will 2 by 12, set 16 inches centers, 16 feet long, well bridged, carry a 3½-inch concrete roof with ¼-inch fall to the foot? Any information will be appreciated.

Answer: Rafters 2 by 10 inches set 16 inches on centers and 16 feet long, if well bridged, will be strong enough to carry a 3½-inch concrete roof. We would think, however, that a roof 2½ inches thick would be sufficient.

S. W. Baxter.

Prepared Roofing and Blocks

To the Editor: Hickman, Neb.

Find enclosed plan of the front of Geo. Broekema's new furniture store, which I have drawn according to my own ideas. It was to be a wooden structure, 48 by 70 with 16-foot ceiling; but now it will be a cement block building. The roof is to be nearly flat, covered with a prepared roofing.

Answer: Rafters 2 by 10 inches set 16 inches on centers and 16 feet long, if well bridged, will be strong enough to carry a 3½-inch concrete roof. We would think, however, that a roof 2½ inches thick would be sufficient.
How would you properly construct the part of the walls which extend above the roofing to keep it from leaking?

J. E. OFFER.

Answer: The roof should be flashed at the fire wall with tin flashing as per the enclosed drawing.

Proper Truss Construction

To the Editor: Breckenridge, Minn.
I am sending you a rough sketch of a roof truss; I beg of you to let me know if the timbers are strong enough for this size span to carry the ceiling and a shingle roof.

JACOB REELINGER.

Answer: The timbers of your truss seem to be sufficiently strong, but we have made a change in the size of the rods and have used a different method of setting the purlins from that shown in your sketch. The attached is a sketch of the truss as it should be constructed.

For Square Planing

To the Editor: Canyon City, Ore.
I have been a subscriber to the AMERICAN CARPENTER AND BUILDER for several years and think it is the best magazine published of its kind.

Would like to tell C. H. Taylor in July number, how I plane the edges of boards to make them square with the sides. I make a gauge, like this sketch, out of inch lumber and about 8 inches long. After nailing the 1½-inch strip on top I square it up with the plane and try-square. By holding this under your jointer you will get good results and also save lots of time.

M. Dexter.

Good Advice

To the Editor: Waynesburg, Pa.
In reply to Clarence H. Taylor, who wants to know how to plane the edge of a board square; the first thing to do is to place the board firmly on work bench and then with mind and eye fixed on the board, before you (your attention must be on what you are doing) use a try-square to help. Put your plane in good order; it must not be out of order or you can not joint true. In case you fail the first trial try again until you are sure you are right.

This reminds me of a story of a man who had a boy apprentice. He sent the boy to the shop to make a straight edge. The boy not getting back as soon as the man, or boss, expected, he went to the shop to see what was the trouble. The boy was working at the straight edge; but a few steps away was a young lady sitting on the front steps. In sighting along the edge of the board he would see the young woman. So he said to the boss, that he could not get the board straight. So the boss took hold of the plane, and sighting along the board he saw the young lady. Realizing the difficulty the boy had encountered he said to the boy, “You straighten that board if it takes all day!” then went back to his work and left the boy to straighten the board. So I will say to Mr. Taylor, in order to be a skilled workman requires study, thought, neatness, energy, promptness.

ROBERT I. MILLIKIN.

Arrangement for Jib Head Frames

To the Editor: Allentown, Pa.
In answer to A. H. Baird, I send the following sketches, showing section through head of window frame for a brick wall, with box head for lower sash to slide up. The slide B will be pushed up along with sash to top of box. When
Bending Canoe Ribs

To the Editor: Fredrickton, N. B.

In reply to the request of M. Lind in the July number for a simple steam box for bending canoe ribs, etc., I beg to submit another method which I have used for many years with complete success.

A 6-foot length of cast iron pipe is plugged with clay at one end and suspended over a fire, as shown in the sketch; the plugged end being below the fire. The pipe is filled with water and the pieces to be bent are placed in the pipe and boiled until soft and pliable. They are then removed and placed on a form with rather more curve than is required for the rib when finally in its place in the canoe or boat.

This device has been used by pupils of our manual training schools for some years past and no difficulty has been experienced with the work.

T. B. Kirner.

Good Planing Form

To the Editor: Sardis, Miss.

Please permit me to answer the inquiry of Clarence H. Taylor relative to squaring lumber with a hand plane.

First of all, my boy, is to know that your plan is in proper shape. I mean by that it must be straight and out of wind, and the cutter or bit, commonly called, must be nearly straight on cutting edge, just a shade rounding.

Now you have your plane in proper working order, let us proceed to use it right. Set your plane on the board to be squared, at front end. Be sure that your plane is parallel to the board; and with stroke of the plane move backward until the end is reached. Stand just close enough to your work so that when the center of your plane is centered with the board your elbow is just close to hip, not close enough to rub. Do not allow the heel of your plane to get off back side of board. Keep your plane at all times parallel with your side of board.

J. W. Burns.

Steel Square Rafter Scales

To the Editor: Weldon, Iowa.

I here ask you to furnish me instructions telling how to use the rafter scale that is now given on the steel squares. I have not been able to find instructions how to use them yet; also the jack rafters.

John Fairall.

Answer: There has been probably a score of patents taken out for rafter tables stamped on the steel square, but so far, only two are prominently before the building public. One of these is manufactured by Sargent & Co., 1149 Leonard street, New York, and the other by the Nichols Manufacturing Company, of Ottumwa, Iowa. These parties publish instructions for the use of their squares, and no doubt will gladly mail a copy to those desiring them. Drop them a postal with your request.

Valuable Interest Formula

To the Editor: Pueblo, Colo.

Noting that many of your problem fiends are interested in mathematics I submit a formula which I have just derived, partly because I knew it would be very convenient for use and partly because I wished to see if I could do it. I would like to submit it to your readers asking if they know of a simpler one or whether they find any error in mine:

AN INTEREST FORMULA.

For finding the total to which any number of regular installments of $1.00 each, drawing any rate of compound interest, compounded any number of times per year, will amount—

Let R equal interest on $1.00 for one year.

Let N equal number of years during which payments are continued.

Let X equal number of payments between each compounding time.

Let Z equal number of compoundings per year.

Let T equal amount at the end of N years.

\[
T = \frac{X + R}{XZ} \left( X^{Z} - 1 \right) + \frac{R}{Z} \left( 1 + \frac{R}{Z} \right)^{N} - 1
\]

Note.—Use logarithms for calculating the \( Z^{N} \) powers. The formula assumes installments to be $1.00. Should they be otherwise multiply the result by the number of dollars in each installment.

Leroy G. Gates.

How to Cut Up a Sash

To the Editor: Chicago, Ill.

I have seen in your magazine a method of how to cut up a sash, and make same square out and half-circle in, and will say it is a very good method. The method I use is, I think, a much easier one; it is as follows:
I run the lower part below "A" the regular way, as a common sash, only leave the tenons longer. The square head is made of two pieces, as per sketch, mortised out on the shaper, the curved bars shaped and run on the shaper, but not the uprights. The uprights I have on stock, left from some bars I ran over when making sash bars (by the method previously described one would have to lay out the full length of the bars). Then these curved bars I nail on to the top of these upright bars. The square head I mortise and tenon on the lower part of the sash, as per sketch. This also makes a good sash, and as far as the flasting is concerned, will last as long as sash made by any method. I never had any of my sash come back. Of course, for a large size sash with large lights, another method should be used, but for lights six or eight inches in width, the above method is sufficiently strong, as the glass stiffens the bars also.

Hope some other of your readers will give a method of how they make their cut-up sash. JOSEPH P. BATTLES.

A Trick With a Hole in It

To the Editor: Woodhaven, N. Y.

Kindly allow me to agree with J. P. Wells's opinion of N. N. Signed's "sticker," as he gives it in the July number; and I hope that N. N. Signed will not buy gold bricks from A. Helander, if Helander sells 65 square inches cut from an 8 by 8 inch piece, nor would I care to be in the same boat with Helander if he patches 65 square inches with 64 square inches—if it is more than swimming distance from shore.

I first saw this same "sticker" some ten years ago, when after a while I had occasion to pay for my folly. Let me advise Helander to cut this trick out of paper, and if he takes care of his angles he will see where he loses.

Thanks, Mr. Editor. A SUBSCRIBER.

How Much Will They Do?

To the Editor: Farmington, Mo.

Will you kindly answer the following question and thereby place a charter member under renewed appreciations of your kindly advice?

About how many yards of concrete would make an average days work for two men of eight hours each; the material to be elevated to a height of about ten feet to begin with (up on a concrete wall) and built to a height of twelve feet, the square head I mortise and tenon on the lower part of the sash, as per sketch. This also makes a good sash, and as far as the flasting is concerned, will last as long as sash made by any method. I never had any of my sash come back. Of course, for a large size sash with large lights, another method should be used, but for lights six or eight inches in width, the above method is sufficiently strong, as the glass stiffens the bars also.

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How to Make a Porch Swing

To the Editor: Oak Park, Ill.

I am sending you sketches showing how I have made a porch swing; it is very similar in construction and design to the one described in the American Carpenter and Builder of July, 1908. It is a very useful piece of furniture and should find a place in every home. It was not expensive, made in my own work shop at home; and when once completed is well worth the trouble of its construction. The wood used was:

- 2 pieces—3 inches wide by 3 inches thick by 26 inches long
- 2 pieces—3 inches wide by 3 inches thick by 20 inches long
- 4 pieces—3 1/2 inches wide by 7/8 inch thick by 20 inches long
- 2 pieces—4 1/2 inches wide by 7/8 inch thick by 25 inches long
- 22 pieces—2 inches wide by 1 inch thick by 20 inches long
- 7 pieces—8 inches wide by 1 inch thick by 13 inches long
- 2 pieces—2 1/2 inches wide by 2 1/2 inches thick by 8 feet long
- 1 piece—8 inches wide by 1 inch thick by 7 feet 2 inches long
- 1 piece—3 1/2 inches wide, 7/8 inch thick by 7 feet 2 inches long
- 2 pieces—1 1/2 inches wide by 3/4 inch thick by 7 feet long
- 8 inches wide and one-half inch thick and one-half inch deep.

Next I made the piece which is used as the back rest. This piece is tenoned into the two back posts one inch deep and to its lower side has seven mortises one-half inch deep into which the slats are tenoned. The other piece which makes the rest of the back is also tenoned into the two rear posts one inch deep and five inches from the bottom, and in its upper side has seven mortises, seven and one-third inches apart, eight inches long, one-half inch wide, and one-half inch deep, into which the slats fit.

The two pieces two and one-half inches wide, two and one-half inches thick and eight feet long were used for the supports. The two ends were fastened to these by the joint shown in the cut. Three inches project at each end, to which the chains are attached, by which the swing is screwed to the back posts.
The cushion was not made of leather for that is very expensive, but of heavy canvas stuffed with hair.

STANLEY B. FURBECK.

From Arizona
To the Editor: San Carlos, Ariz.
This church, the first church to be built by the government at the San Carlos Agency, I put up with only Indian help. I cut the stone, laid them; did the cement work, including chimney of cement; did the plastering, painting and decorating; set the glass; and what is more, worked out all the sash, doors, molding, etc., by hand. Did everything with only Indian (Apache) help.
Now I have a question in regard to creosoting shingles that I would like to submit to the readers of the AMERICAN CARPENTER AND BUILDER. What I want to know is the best method of dipping shingles before putting on, as putting them on a roof in the raw and painting after they are laid only coats the outside. Here in Arizona, where we have plenty of sunshine (hot) and dashing showers it wets in under them. The hot sun comes out and draws the shingles crooked. So I want to know the best way to dip them and dry them before laying. I want the most expeditious and cheapest way. Would two-thirds of the butt end be deep enough to dip them?

J. R. KEMP.

He Doesn't Like the Formulas
To the Editor: Fort Smith, Ark.
I am not a regular subscriber to the AMERICAN CARPENTER AND BUILDER, but I generally secure a copy of it every month at the newsdealer's. I often get valuable information from it, but I am sorry to say there seems to be a tendency on the part of some of the correspondents to hide what otherwise would be valuable information behind formulas of higher mathematics, thereby obscuring the very information they have sought to give.
In looking over the March number of the AMERICAN CARPENTER AND BUILDER I noticed the heading, "The Sticker Solved," being a solution by L. A. Peterson, C. E. Bidler, H. Halverson, Ira S. Griffith and a host of others, of the rafter problem submitted by R. L. Ricks. Even the Editor seemed to feel good over the fact that the sticker was not as sticky as Mr. Ricks thought.
I did not notice Mr. Ricks' request for the solution of this problem and do not know whether his object in so doing was purely for information or not, but I assume it was. If so, to me the solution fails to solve; the information given fails to inform.
I believe it would not only be a benefit to Mr. Ricks, but to many others to give a simple, practical solution of his problem in a manner that can be used in practice. After carefully reading the solution of the problem by the above named gentlemen, I say, "Yes, very good. But how do you do it?"
I have sympathy for any brother who seeks information; I believe they should receive it in a manner that can be applied directly to the work. As I take it, it is not merely the knowledge of the length of the rafter in question that Mr. Ricks wants, but the knowledge of the principle involved, so that he can use it when and where necessary. He may have another shed roof to put on sometime, it might have a run of 10 feet instead of 8 feet, and might possibly have a different pitch from the one in question; so he would be stuck again, and again have to come back for information. So, Mr. Editor, with your permission I will endeavor to give a plain, practical method of solving this problem that will cover all conditions of this class of work.
Yes, I have sympathy with every brother who feels the need of information; I have been all along that line myself. About thirty-five years ago I left my father's house on the Iowa prairie, about twelve miles east of Mr. Peterman's town, and went to Casey, to learn the carpenter's trade. I have been up against it ever since in many states and many cities. My career has been a flat failure from a financial point of view; yet I am not sorry, because I have picked up
many a crumb of experience and information. In all these years, whenever I was up against a problem pertaining to the practical solution of work that I did not understand, I have made it my business to learn it. I take pleasure in doing and knowing how to do good work. Yet I often feel myself in need of more practical information, a feeling of the need of someone to O. K., or of a system by which I could compare and verify my own calculations.

It was this need that only recently prompted me to invest a good sum of money in a set of books, hoping by their assistance to more thoroughly understand and more surely design and construct and calculate the strength of reinforced concrete columns, beams and floors. But alas, the information sought, and perhaps contained in the volumes, is covered and completely hidden under formulas of algebra and trigonometry. The books still leave me standing alone with only my past experience, and my old hard head to figure out these great problems!

Why is it that those who know how to do things won’t or can’t impart the information in a manner that will inform? Why can’t they give it in plain arithmetic and everyday practice, instead of giving it in a way that only a student of the higher mathematics can understand? And if they do understand the formulas, they seldom have the ability to make a practical application of them. The idea of shooting a man full of higher mathematical formulas when he has asked for plain, practical information! Has not the thought ever occurred to any of you that if a man understood enough mathematics to make anything out of your formulas, he would not have had to ask for such information in the first place, being able to figure it out for himself?

I am not saying anything against mathematics. I believe the more one knows of mathematics the better. I often feel the need of more, but the workman that expects to earn his wages through his ability to figure out the length of rafters or braces or any other thing that goes to make up a job, will utterly fail to do it. I have seen a few so-called workmen that would spend a lot of time covering the best finishing lumber on a job with a lot of figures that had to be cleaned off again. They could figure out the length but they could not do the work.

I take it it is not a lesson in mathematics the average workman needs, but plain information that will enable him to make a practical application of the rules to the work in hand, so that he can take his square and lay his work off directly on the timber. He wants a practical rule of do it, and be done with it.

If I understand it, Mr. Ricks wants to know how to correctly lay off a rafter for a shed, having a span of 8 feet and a pitch of 2 inches to the foot, and intersecting with a main roof having a pitch of 8 inches to the foot, both plates same level.

Here is a method that is easily understood and is reliable:

First, select a straight stick of timber from the stock you intend to use for rafter. Put it on your saw benches; now take your square and begin at the toe of the rafter (point A of the diagram; now, as the pitch of the roof is 2 inches to the foot, place 12 on the blade at point A and bring figure 2 on the tongue even with the edge of the stick. Hold square in position and scribe across timber against blade, from point A. This gives you the foot cut of the rafter. Now as the shed is 8 feet wide, proceed to carefully measure off along the edge of the stick 8 laps of the square in position you now have it, 12 to 2.

This method of rafter framing is too well known to need explanation. This brings you to point B, 16 inches directly above point C, which is the toe of the main roof rafter, having a pitch of 8 inches to the foot.

Now, we have just come to the problem, how are we going to know how much longer the shed rafter has to be from point B to intersect with the main rafter at point D? It is this way. Take the distance the two rafters are apart at points B and C, this case 16 inches; divide this distance by the difference in pitch of the shed and main roof, in this case 2 inches pitch and 8 inches pitch; difference, 6 inches. Sixteen divided by 6 equals 2 2/3, which simply means we have 2 feet and 8 inches run, farther to go from point B. So proceed to measure off 2 2/3 laps of the square as before using 12 and 2, from point B to point D, which is the point of intersection. Now if it is desired to seat head of shed rafters on top of main rafters, hold square in position, and scribe across timber against blade of square. This gives level line. Take pitch of main roof, 12 on tongue, 8 on blade; bring figures to level line, so tongue will cut point of intersection, scribe across against tongue at point of intersection; cut it. The job is done in half the time any man can tell about it. If it is desired to locate point of intersection on main roof, just measure off 2 2/3 laps, 12 and 8 (the main roof pitch), from point C on main rafter, and you have the spot again. This rule holds good for any pitch. All that is necessary to do is to think, to think with your head, and use your square.

John Stillians.

Handspike Problem Solved

To the Editor:

Hanford, Cal.

Please state that the two men with handspike at one end of timber 30 feet long should be 7 1/2 feet from the end in order to carry their portion of the timber, a third man carrying his share at the other end.

Let us suppose the three men equal in weight and the timber balanced on a pivot in the center and the query to have been, where shall the two men suspended at the end of a handspike across the timber, be placed to balance the one man suspended at the other end? All will readily say, suspend the two men at a point from the center, which multiplied by two produces the same result as one multiplied by 15, which is 7 1/2. While the men are placed at this point, with the timber yet balanced, change the condition so as to have all three of the men to pull upward instead of downward, and the principle of the "steel yards" applies, which distributes the weights so that relative weight on one end multiplied by the distance it is from center equals the weight on other side of the center multiplied by its distance from center. This is true whether the factors are pulling down, or the factors are pulling upward.

I am not saying anything against mathematics. I believe the more one knows of mathematics the better. I often feel the need of more, but the workman that expects to earn his wages through his ability to figure out the length of rafters or braces or any other thing that goes to make up a job, will utterly fail to do it. I have seen a few so-called workmen that would spend a lot of time covering the best finishing lumber on a job with a lot of figures that had to be cleaned off again. They could figure out the length but they could not do the work.
Silo Construction

To the Editor:  
Paulding, Ohio.

I wish you would kindly instruct me how to build a silo and what kind of material to use.  
FRANK HART.

Answer: The drawing shows the construction of a silo, built of concrete, wood and brick so as to unite strength, durability and an artistic outline. The foundation walls are constructed out of concrete 2 feet in thickness and running down below the frost line, where they rest on a 10-inch by 22-inch concrete footing course to avoid settling. This concrete work is composed of one part Portland cement, three parts sand and four parts crushed stone, and is reinforced with a 3⁄8-inch iron hoop to prevent the walls from spreading. There are anchor bolts bedded in the concrete by which the wooden sill is bolted solid onto the concrete foundation.

The area inside the foundation is excavated down to the footing course in order to increase the capacity, and has a concrete floor slightly pitched to the center.

Frost may not do great damage to the silage as far as its...
food qualities are concerned, but if frozen into a solid mass it is very difficult to handle and should therefore be to some extent protected against severe frost. Hence wood construction with dead air spaces between the studding and heavy building paper between the sheathing has been selected as the most practical construction.

Silage is very heavy and creates a great pressure against the walls, similar to water in a tank, and to prevent this pressure from bulging out the walls silos are usually built in the shape of a cylinder. To properly preserve the silage it is necessary to exclude the air, hence the walls must be perfectly air tight. Where an extra good job is wanted the inside surface has been veneered with vitreous paving brick, which do not absorb moisture and are proof against the action of acid. These bricks are laid tight against the sheathing surface so that the pressure cannot change their position and laid in a thin bed of cement mortar, not exposing any more mortar to the surface than is necessary to properly bond the brick together.

The exterior surface is composed of dressed and matched narrow flooring set vertically to the outer hoops. About 10 feet above the ground there is a singled belt for exterior effect. The roof is of shingles and has a wide projecting cornice.

**A Heavy Timber Barn**

To the Editor: Grove City, Minn.

I hereby send you a picture of a full frame barn which I would like you to give a space in your valuable paper. It is a structure 36 by 64 feet long and is framed out of 6 by 8 inch timbers with 30-foot purlin posts. You will notice that there are quite a few temporary braces in it. It was my intention to take them out before the picture was taken; but it was such a bad wind the day we raised it that we had to keep them on. You will see that on top of the purlin post there is a 4-foot post that is bolted right on the posts before it is raised, and is fitted with a pulley in the top, for a rope to run through, and is a very handy thing to take up the purlin plates. When done, we just loosen the bolts and take them off. If there are any of the readers of the American Carpenter and Builder that would like to get a sketch of them I will be glad to give it. This barn was framed by one man and myself in five days and a half. O. P. Barrows.

**Cement Roofs**

To the Editor: Pincher Creek, Alta.

In using prepared roofing, would there be any advantage in applying sand and gravel with Portland cement instead of tar?

If this is not practicable, will you kindly advise me of the lightest concrete roof which one can apply, and also state the method used?

The "pioneer" in concrete work in his district cannot afford to experiment, for the slightest lapse on his part is at once attributed to the material, the method and experimenter get off scot free; the reason is obvious, the last two are "small game"; the critics—generally building contractors—are "laying for" cement, and welcome any such opportunity.

"INTERROGATION POINT."

Answer: The prepared roofings, as they are now generally made, contain certain amounts of tar, natural pitch and similar substances. For this reason tar is used to best advantage in laying these roofings for cementing the seams and making them water-tight. A wash of Portland cement and sand might be used satisfactorily in this way, although it would not be as good and durable as the hot tar dressing.

If a concrete or cement roof is wanted there are three or more kinds which you can safely use; first, reinforced concrete slabs; second, 2½-inch cement coat similar to a cement walk composition laid down on matched wooden roof boards, supported by ordinary rafters and framing; third, an ordinary cement shingle or cement tile roof.
Monel Metal Sheets

We take pleasure in calling the attention of our readers to a booklet recently issued by the American Sheet and Tin Plate Company descriptive of their new product "Monel Metal" and telling of a few of the great variety of uses to which it is adapted. This booklet also contains tables showing the physical properties of this metal, together with some very interesting and convincing tests. Additional information and data will be furnished gladly upon application and the company will also be glad to submit samples in any of the various gauges for your inspection or tests.

Monel metal is a new product which means much to the sheet metal worker, the roofer and the manufacturer, because of its great range of adaptability and large field of usefulness.

It is a natural alloy in guaranteed proportions of 68 to 72 per cent nickel, 1½ per cent iron and the balance copper. In smelting and refining the ore the nickel and copper are not extracted or separated, and, therefore, are found in the finished product in the same relative proportions. This gives us a metal that is tough and strong. It is ductile, flexible, easily worked, and can be drawn, spun, seamed or polished. It can be formed up into suitable shapes and bent into such locks as go, for instance, with the standing seam roofing.

Monel metal can be soldered readily with a killed acid, and can be brazed with ordinary brazing solder. A test of this kind showed that a 3/16-inch section of No. 26 gauge, with a brazed joint, had a tensile strength of 1,700 pounds, or about 60,000 pounds to the square inch. It is a non-erosive and non-corrosive as pure nickel, which makes it invaluable as a roofing or any place where non-corrosive qualities are of vital importance.

This metal has the important property, particularly as compared with copper, of showing relatively smaller expansion and contraction changes. Another valuable feature of this metal is that it has a tensile strength approximately three times as great as copper. It is less expensive than nickel or German silver, since, in the former, the expense is largely in the difficulty of isolating it, and in the latter we have a manufactured instead of a natural alloy.

Monel metal sheets are used for roofing to supplant copper, and, owing to their great strength and non-corrosive qualities, a much lighter sheet can be used and greater efficiency and service obtained at a lower initial cost. Undoubtedly, they are the very best material that can be used for this purpose. They are used for cornices, gutters, metal window

A New Metal Sash for Store Fronts

For Show Window Construction where no wood is desired.

This new Metal Sash, No. 50 and No. 100 will meet every requirement. It is made in 37-oz. Cold Drawn Copper, Brass, Aluminum or Bronze. The face piece and inside piece unite forming a self-supporting construction.

These sash are identical except the No. 50 Sash is so arranged that the glass can be set from the inside, for the installation of plate glass above the first floor; while the No. 100 Sash permits glass to be set from the outside and is particularly adapted to the installation of plate glass in first story show windows. The No. 100 Sash is fully equipped with drainage and ventilation device, a feature which distinguishes Kawneer from all other Store Front Construction.

The same high standard of Kawneer workmanship, quality of materials and design has been maintained in this type of Sash. On all Kawneer Bars will be found this Patent Stamp

Kawneer Manufacturing Co.

HOME OFFICE, NILES, MICHIGAN

BRANCH OFFICES:

Chicago New York Kansas City Minneapolis Indianapolis Detroit Cincinnati
St. Louis Boston Kansas City, Minn. Lincoln, Neb. Young City, Ia. San Francisco
Pittsburg St. Louis Denver Chicago, Ill. Los Angeles

SEE SWEET'S INDEX PAGES 650-651
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

PATENTED MAY 22, 1894

DOES NOT STAIN OR BUCKLE;
frames, ventilators, skylights, smelter roofs, mine screens and chutes.

This product is also adaptable for automobile parts, gaskets, smoke jacks, range boilers, laundry machinery, tanks, kettles, refrigerator work and vessel sheathing, where non-corrosive qualities are important as well as the toughness of the material to resist impact; for innumerable stamping and forming purposes,—kitchen utensils, toilet articles, bathroom fixtures and products such as are made with a brass base and nickel plated.

Monel metal sheets are manufactured exclusively by the American Sheet and Tin Plate Company, and are furnished in sizes up to 36 by 96, and in all gauges. The fact that these sheets are rolled in the famous Vandergrift works, the largest sheet mill in the world, is a sufficient guarantee of their exactness and uniformity. While Monel metal sheets are practically a new product, they have opened a wide field to every user of sheet metal. For progressive metal workers, stamping concerns and manufacturers, their range of usefulness is practically unlimited.

No-Break Sliding Door Lock

The Richards Manufacturing Company, Aurora, Ill., have recently put on the market a sliding door lock which is regarded as an article of unusual merit. It is called the "No-break" lock. It is simple, durable, positive and secure. It marks a decided advance in the construction of sliding door locks for barns, warehouses, garages, factories, house-boats, etc.

The working parts of the Nobreak lock are few and simple. The action is positive. The principle is such that the lock must act. The jaws are extra strong and non-breakable. The locking mechanism is so simple that only one tumbler is required. There is a different key for each lock. The lock is reversible—can be used on either side of door and can be locked or latched from either side.

The Nobreak lock receives and grips the holding lug through an opening in the side of the lock. The door—not the lock—receives the blow when door strikes jam. This is a distinctive and important feature of this lock. The lock-grip is flush with the door and the holding lug is fastened to the jam entirely outside the door opening. There are thus no projections whatever on which to catch harness or tear clothes. The hand-hole covers operate from both outside and inside and serve as flush pulls as well as operating the lock. The Nobreak lock cannot be tampered with—it cannot be picked, and the use of the blind screw studs on the outside makes lock practically burglar-proof.

The Haven Floor Planer

The work of properly preparing a hardwood floor after it has been laid is one of the problems of the carpenter today for it entails an enormous amount of the hardest kind of work. Therefore an ever-increasing demand has been made for a mechanical contrivance which will be simple in operation and at the same time will transform the floor into a thing of beauty.

The Haven Manufacturing Company, of Racine, Wis., are marketing now a floor planer which is entirely unlike anything before the public.

By glancing at the cut here the principle of their machine is apparent and its mechanical advantages are obvious. Its essential features may be summarized by saying that they consist of a tool-carrying lever mounted on a carriage confined to operate in a horizontal plane by a true and level trackway. By using this method it is easily seen that there is no heavy weight to be dragged back, merely a weight of not more than 10 pounds, which glides along the runway with practically no effort.

The use of the "Haven" permits the operator to get in close to the base boards, inasmuch as the plane at the end of the lever extends under the runway several inches. And herein lies the main difference between the "Haven" and other floor scraping devices. The tool that does the scraping is nothing more or less than a plane which absolutely prevents a "wavy" floor.

In reading over their catalogue we find the following:

1. It does perfect work. Its very mechanical construction makes it easier to do good work than poor work. The carriage runs over the smooth and true track, while the use of the smoothing face of its blade produces a perfectly flat and level surface, free from "waves," and superior to most hand work.

2. It makes the work easy; it is not a man-killer. The operator does not have to roll to and fro a hundred pounds or more of dead weight all day long and feel like a beast of burden at quitting time. He will never refuse to use the "Haven" because of its hard running qualities.

3. It does more rapid work than done in any other way. It will do the work of several men with less wear and tear. The reasons why are evident, for, besides taking the workman off his knees, the banishing of heavy weight and the applying of a stroke about twice the usual length, permit the work to proceed rapidly and without resting spells.

4. It makes the work of floor dressing a simple task. It does not require the services of a skilled mechanic to do the work. It is true that the blades should be sharpened and
LUMBER TRUST PRICES SMASHED!

CHICAGO HOUSE WRECKING CO.'S GREAT OFFER!
150,000,000 Feet of Brand New Lumber at Wrecking Prices!

We purchased direct from the Mills, at various Forced Sales, thousands of carloads of high-grade, first-class, brand new Lumber. We bought it at sacrifice prices and now can offer it for a reasonable mark-up of profit. This is an opportunity of a lifetime to buy the very best lumber manufactured at prices less than the dealer or jobber can ordinarily get it. Don't delay a single moment. Even if you have no immediate need for lumber, the time to buy is today when our low prices are calling on you for action. You will never again be able to buy lumber at such low prices as we offer.

We don't ask for money in advance. You can buy without sending one cent of money with your order. All we require is a guarantee as to your responsibility. Money refunded if material cannot be delivered within a reasonable time.

We have a large stock of material and can supply of every kind of material from a sheathing board to the very best quarter-sawed white oak. We refer you to any bank or bank anywhere. Or you can write direct to the Great Block Yard, The Drovers' Deposit National Bank of Chicago.

THE HIGHEST GRADE DOORS ON THE MARKET AT LESS THAN WHOLESALE PRICES!

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CHICAGO HOUSE WRECKING CO.,

THE MOSTEST GRADE DOORS ON THE MARKET AT LESS THAN WHOLESALE PRICES!

$650 Buys all the Material to Build This House!

$700 Buys all the Material to Build This House!

$780 Buys all the Material to Build This House!

HOUSE DESIGN No. 126

In the design illustrated above we have made a complete departure from the conventional methods in house designing for a dwelling of five rooms. It contains 7 rooms, bathroom and reception hall room. It is of entirely classic architecture. It is handsome entrance with the Maitre Columns and Colonial windows fitted with panel storm doors, gives a classic finish to this house of distinction all its own. It is arranged for seven rooms, bath, pantry, stair hall and the necessary closets. The handsome entrance, open stairway leading to the second floor and the landed entrance window and window seat located in the parlor, all combine to ensure the harmony of this design. It is provided with every essential convenience of a modern home. Its large number of windows insure an abundance of light and air and by reason of its compactness, it can be erected at a very moderate cost.

SEND US YOUR LUMBER BILL FOR ESTIMATE! WE'LL SAVE YOU MONEY!

Upon request we will name you delivered prices so you will know quacty what the material you select will cost you laid...These prices...are...good...for...June...and...July...only.

In the design illustrated above we have made a complete departure from the conventional methods in house designing for a dwelling of five rooms. It contains 7 rooms, bathroom and reception hall room. It is of entirely classic architecture. It is handsome entrance with the Maitre Columns and Colonial windows fitted with panel storm doors, gives a classic finish to this house of distinction all its own. It is arranged for seven rooms, bath, pantry, stair hall and the necessary closets. The handsome entrance, open stairway leading to the second floor and the landed entrance window and window seat located in the parlor, all combine to ensure the harmony of this design. It is provided with every essential convenience of a modern home. Its large number of windows insure an abundance of light and air and by reason of its compactness, it can be erected at a very moderate cost.

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AMERICAN CARPENTER AND BUILDER
5. It makes the work of floor dressing agreeable, banishes the dread of a once unwelcome, laborious and dreaded job and raises the task to the level of any kind of the more pleasant duties to which the "sons of toil" may be devoted. Address the Haven Manufacturing Company, Racine, Wis.

Union Roofing Improvements

The last of the extensive improvements made by the Union Roofing & Manufacturing Company at their St. Paul plant covers the erection of an enormous tarred felt warehouse with an immense underground reinforced concrete tar well. The new building is 200 feet long by 70 feet wide and will be of massive mill construction throughout. The tar well underneath the building is 110 feet long and 65 feet wide, with a depth of 12 feet. This allows a storage capacity of over five hundred thousand gallons of tar. The top of the tar well, which is the ground floor of the warehouse building, is a solid reinforced concrete slab 1 foot thick. When completed this monolithic construction will stand a pressure of one thousand pounds per square foot.

The warehouse will be two stories, of heavy mill construction, and will be equipped complete with elevator service and other modern conveniences necessary to the handling of great volumes of stock. This new building, together with the complete plant, will soon be protected with an automatic sprinkling system, the preliminary work having already been started.

Union Floor Scraper

Geo. J. Bachmann, 501 Lyon street, Grand Rapids, Mich., has perfected and is manufacturing a practical, low-cost floor scraper, the "Union," which, it is claimed, overcomes completely the difficulty sometimes experienced with such machines. Some machines turn out non-uniform, wavy work and a wavy floor looks worse than a floor that was never scraped. This company has perfected a machine in the "Union" that does not wave a floor.

A few of its special features are the adjustable head, the automatic shaving remover with rubber shoe that leaves the floor clean for the wheels to roll on, and the firm handle arrangement. Moreover, the machine has enough weight to

We Want To Tell You How You Can Put Every Cent of the Dealer's Profit Into Your Own Pocket

You can save not only the dealer's profits but his excessive charges for installation and repairs.

You can deal direct with the manufacturers.

The Jahant Down-Draft Furnace

Only Ten Dollars Down and Ten Dollars a Month With Freight Prepaid East of the Mississippi River.

This wonderful furnace has proven its superiority over others during the last thirty years. It is without a doubt the best heating system ever devised. It saves from one-third to one-half in fuel bills, because the patented down-draft burns hard or soft coal, wood or lignite, without cinders or clinkers, giving the full heating value of every particle of fuel.

THE JAHANT DOWN-DRAFT FURNACE

is scientifically correct. Every part is cast of the best New Gray Pig Iron; no sheet steel is used; the fire pot will last a lifetime; cracking is impossible. A strong "Guaranty Bond" goes with every JAHANT, which allows a three hundred and sixty day free use of the furnace.

You run no risk, as we supply special plans, full instructions and give free, all necessary tools, so that any man who can drive a nail can successfully install a JAHANT.

Let us tell you something about the conveniences and good points of our furnace, its economy, its healthfulness and how you can save money.

We have an interesting and money-making proposition to make to every carpenter and builder. Write today for our book.

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Asbestos
"Century" Shingles

"The Roof that Outlives the Building"

You roof a building to protect it from weather, from fire, and time. Then choose a roofing that is itself weather-proof, fire-proof, and time-proof.

Asbestos "Century" Shingles are the only roofing that actually improves on the roof. Dense and elastic shingle-like sheets of asbestos fibre cement, that mature like every other concrete with exposure to weather, to freezing and thawing.

Fire cannot burn through them, chip, crack, or flake them. Asbestos "Century" Shingles outlive the building and need no painting or repairs. Made in a great variety of shapes, in several sizes and three colors—Newport Gray (silver gray), Slate (blue-black), and Indian Red.

Ask your Roofer for new quotations. Write for Booklet, "Roofing 1909."

The KEASBEY & MATTISON COMPANY, Factors, Ambler, Pennsylvania

TIME WILL TELL—BUT NOT ON

"First Cost is Last Cost"

The very name "GAL-VA-NITE" carries with it a positive feeling of satisfaction. The carpenter or builder who either specifies or uses this high grade ready roofing on a building can rest assured that the owner will be satisfied. GAL-VA-NITE marks that degree of perfection among roofing materials which characterizes it as the "STANDARD" of moderate priced ready roofings. It has made good in all climates and under all conditions. The fact that it needs no painting or after attention when once on the building, makes it especially in demand by house owners who have long since tired of the expense and trouble of patching up leaky roofs. GAL-VA-NITE is waterproofed with a triple coating of mineral asphalt and weatherproofed with a heavy "armor-plating" of flaked mica, which makes it impervious to the ravages of rust and the dangers of flying sparks and fire-brands.

Better let us send you FREE SAMPLES and ROOFING BOOKLET. A postal today will bring them to you.

UNION ROOFING & MFG. CO. 1100 East 7th St.
ST. PAUL, MINN.
WE HAVE DISTRIBUTING WAREHOUSES IN THIRTY-FIVE CITIES

"BRADFORD REDS"

Ask the Man WHO BOUGHT THEM.
Or The Bricklayer WHO LAID THEM.

Bradford Pressed-Brick Co.
BRADFORD, PA.

WE HAVE DISTRIBUTING WAREHOUSES IN THIRTY-FIVE CITIES

When writing advertisers please mention the American Carpenter and Builder.
We want to send a Working Sample of this Paper.
JUST fill out Coupon on next page—we pay postage and all. We are making this special offer and cordially invite you to accept it, because we want you to find out right away how much better Johnson’s Plasto-Filler is than anything else for filling in cracks, holes or crevices and for leveling up depressions.

**Johnson’s**

You must have had trouble at one time or another with whatever kind of fillers you have been using.

*Now you can drop putty, plaster-paris and all other unsatisfactory, troublesome fillers and use Johnson’s Plasto-Filler.*

It will save you hours of work and trouble on the tedious task of filling nail holes, screw holes, floor cracks and wall crevices.

**It’s Economical to Use**

**S. C. Johnson & Son**

“The Wood F

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
IT takes a finish equal to hardwood—does not discolor—does not sink with change of moisture—or climate.

It is sent to you ready for use. Just moisten with water. You mix only as you use it, avoiding all waste and all expense of oils. You do not have to mess with it.

We will also send our free Guide Book for finishing and refinishing wood.

Plasto-Filler

It contains a complete color card and full information regarding advantages of Johnson’s Wood Dye, Johnson’s Prepared Wax, Johnson’s Under-Lac and other of Johnson’s Wood Finishes.

We want you to test all of these Johnson materials at our expense. Cut off coupon while you think of it. Start right away giving your trade better satisfaction by using Plasto-Filler.

JOHNSON & SON, RACINE, WIS.

Wood Finishing Authorities
The Front Rank Steel Furnace

Reduces Your Fuel Bill—
Because it does not Waste
—Burns any Kind of Fuel
Distributes heat evenly and plentifully in the coldest weather.

Let us help you arrange your heating plans—We make no charge for furnishing estimates.

Our latest Catalogue gives complete details and other heating information. It will pay you to send for it—It’s free.

Write us today and tell us, please, the name of your local Furnace dealer.

4045-4057 Forest Park Boulevard • ST. LOUIS, MO.

Amatite ROOFING
Send For a Free Sample

PEOPLE who have “smooth surfaced” roofs on their buildings find it necessary to paint them continually to keep them serviceable. This expense and labor can all be cut out by using Amatite. Its real mineral surface absolutely does away with all painting.

If you will write for a sample you will get an exact idea of what Amatite looks like. This will be immensely more satisfactory than any description we could give—no matter how minutely done. It is really the only fair way for you to judge.

Amatite is so thoroughly durable and reliable without any care or attention after you have nailed it on that, were its cost twice what it is, it would be still the most economical roof to buy. Its durability is unapproached.

It is easy to lay and requires no skilled labor to do the work.

Write today for a sample of Amatite. Our nearest office will supply same at once with a booklet about roofing which will interest you.

B AR T R E E M ANU F A C T U R IN G C O. New York Chicago Philadelphia Boston Cincinnati Minneapolis Cleveland Pittsburgh New Orleans Kansas City St. Louis

Combination Woodworking Machine

The Parks Ball Bearing Machine Company, Knowlton and Fergus streets, Cincinnati, Ohio, call attention in another part of this paper to their No. 450 combination machine for circular sawing, jointing, grooving and boring. They also state that they are the originators of the circular saw, band saw and jointer, combination of foot and power machines, which have been growing steadily in popularity among carpenters and contractors during the past years, and which are especially adaptable for the needs of a well equipped shop.

The machine illustrated here is the Parks No. 410 heavy single table circular saw and 6-inch jointer, with boring or routing attachment, which makes a combination of three machines in one and all ready for instant use. Two men can work at this machine at the same time, one boring and the other using either circular saw or jointer. The guide of jointer can be used for rip saw for any width up to 12 inches wide. The guide on the left of circular saw will take any material up to 20 inches wide and has a guard for circular saw when jointing. From two to three horsepower is required for this machine, according to the amount of work. The machine is furnished in two sizes.

The Parks Ball Bearing Machine Company has for years made a specialty of foot and hand power machines which require a small amount of floor space and which at the same time will do the work necessary in a first-class carpenter or contractor shop, quickly, easily and without heavy engines to furnish power. A catalogue showing these combinations is issued by this company and can be had upon request.

Read These Letters

The “Little Shaver” portable saw rig, as advertised in this issue, is one of the best time and money-savers now on the market and these letters speak for themselves:

“Well Pleased with the Rig.”—The saw rig ordered from you received in good condition. It is all you claim for it—A. E. Huntington, Contractor, North Platte, Neb.

“Doing Excellent Work.”—No more going to the mill to hold it firmly to the floor. This weight is properly distributed. The “Union” cuts with a shearing cut, which is acknowledged to be the best. The blades can be sharpened in the machine.

In setting the blade allow it to go well back into the jaws and bolt tight. There are no eccentrics on this machine, as they work loose and allow the blade to clatter.

The “Union” can be run with one or two men, but will work to advantage with two men.

When Writing Advertisers Please Mention The American Carpenter and Builder
Ventilation Without Risk

IVES PATENT VENTILATING LOCK

A safeguard for ventilating rooms, allowing windows to be left open at the top, the bottom, or both top and bottom with entire security against intrusion, a permanent fixture easily applied and quickly operated, affording three times more protection to the window than the ordinary sash fastener.

THE H. B. IVES COMPANY
NEW HAVEN, CONN., U. S. A.

“SEAVEY” MITRE BOX
meets every requirement

Cuts any angle—special or regular.
Needs no special saw.
Lightest box made.
Can be instantly applied.
The only Mitre Box.

Made so that it is attachable to inside or outside work without a special attachment.

Prices to-day from your jobber or write for the “Green Book”

SMITH & HEMENWAY CO.
108-110 Duane Street,
NEW YORK  U. S. A.

Porcelite Enamels
MEET ALL REQUIREMENTS

Inside  :-:  Outside

Exposures

THE THOMSON WOOD FINISHING CO.
PHILADELPHIA

JAS. H. RICE Co., Chicago, Western Distributors
have my millwork done. Do it all myself at home and on the job. The engine runs as smooth as an automobile and I am building I put up a few weeks ago. I moved the rig from floor to floor and sawed most every board in the building with the rig.—F. B. Thayer, Builder, Auburn, N. Y.

"I Am 'It' in Our Town Now."—Since having purchased your portable saw rig I have received more work, because I can do all my own millwork and do not have to have it done outside. I am pleased with the outfit.—A. J. Naughtin; Contractor, Spalding, Neb.

"Ten Hours a Day for Three Weeks."—We worked your portable saw rig ten hours a day for three weeks and the engine never run hot or troubled us a minute. It paid for itself on this one job.—Alfred Pihl, Contractor, Williams Bay, Wis.

Safe Scaffolding

The steel scaffold bracket manufactured by the Builders' Supply Company, of Detroit, Mich., for contractors and builders' use, has received the highest praise from every user of the brackets. They save one-half their cost on almost every job where used, both in time and materials. Either in the sheeting bracket, or the studding bracket, there is no adjusting or bolting of any kind necessary. They clamp solid on the studs of sheeting, allowing no side swaying whatever, and are absolutely safe; every bracket is tested before it leaves the factory.

With the increased use of brick veneer these brackets will pay for themselves on any fair size job, as all that is necessary is to leave out a brick where the bracket sets against the sheathing, which can be filled in afterward. There are over four hundred contractors using these brackets in Detroit more than pleased with the rig.—J. G. Roy & Co., Contractors and Builders, Springfield, Mass.

"Paid for Itself on One Job."—The portable saw rig I bought from you some time ago paid for itself on a flat

---

**EVERY MAN WHO WORKS WITH TOOLS**

needs Carborundum Sharpening Stones—No other stone will put such a keen, even edge on a tool—No other stone will do it so quickly and easily—

**ASK YOUR HARDWARE MAN**

If he doesn't keep Carborundum Sharpening Stones, write direct to

**THE CARBORUNDUM COMPANY**

NIAGARA FALLS, N. Y.
E. C. S.

KEEN KUTTER
Specific Slim Taper Files

Particularly adapted for filing fine saws. These files are cut with a very thin edge and are in every respect the equal in quality and cutting of the larger sizes. Every one guaranteed, and if not entirely satisfactory, money refunded. If not at your dealer's, write us.

Free Sample Sent on Request.

CONGO ROOFING

GUARANTEED By a Surety Bond

TO CONVINCE the public that 3-ply Congo Roofing will really last ten years, we furnish with every roll a bond of the National Surety Company backing up our guarantee.

THIS BOND gives you absolute certainty that your promise will be made good. We DON'T CONSIDER that the bond is necessary, but it serves to show how firmly we believe in the durability of our products.

ANY MANUFACTURER could say as we do, that his roofing will last ten years, but we show that we mean business when we back up the guarantee with a genuine Surety Bond.

THE ONLY THING for us to do under these circumstances is to make a roofing which will stand the test and outlive the guarantee period.

NEW YORK - CHICAGO - SAN FRANCISCO
AND ALL PRINCIPAL CITIES

Prominent insurance experts who recognize the fact that some bars actually break plate glass have recommended the Petz bar as safe, strong and reliable.

Send for opinions of prominent users and our booklet, "Modern Store Front Construction." It describes and illustrates different forms of Petz Bars. Write today.

DETROIT SHOW CASE CO.
491 West Fort Street. (Sole Makers) DETROIT, MICH.
For sale by Flitsburg Plate Glass Co. at all its branches.

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
eastern Branch.
525 west 23rd street,
New York City.

alone in lots of from one to five dozen. When not in use or
when required to move them they can be shut up in a very
small bundle and take up little room in storing.

One essential point which cannot be overlooked is that
there has never been reported an accident on a scaffold where
these brackets were used, which fact every workman or con-
tractor can appreciate. These brackets entirely eliminate this
danger, which should be impressed on every builder in the
country. See illustrations in their advertisement on another
page.

Anderson’s Automatic Floor Smoother

More than four years of practical experience and observa-
tion in the floor surfacing machine business have been em-
bodyed by Mr. E. W. Anderson in his new machine, the
Anderson automatic adjustable floor smoother. From the
very beginning of this industry Mr. Anderson has been
actively engaged in it. His work has taken him into all
parts of the country and has brought him into intimate con-
tact with the floor surfacing contractors and the operators
of the machines of various kinds.

From these men—actually engaged in the business of floor
surfacing—he has gained a thorough first-hand knowledge of
the merits, as well as the shortcomings, of all the floor scrap-
ing and floor surfacing machines that have been developed and
offered to the building public.

Moreover, this experience and intimate knowledge has
enabled Mr. Anderson to design a machine which now, it is
said, combines all the good qualities of all the others while
escaping their faults, if any. This machine is now offered
for the first time to the building public. It is known as the
Anderson automatic adjustable floor smoother. It is manu-
factured by the Triple “A” Machine Company, 1020 Chicago
Opera House building, Chicago, Ill.

It is said that the Anderson floor smoother is so made that
it always does perfect work in scraping and sand-papering
new or old, hard or soft wood floors. All contractors and
operators who know what a floor surfacer is and the benefits
coming from its use—but who are now dissatisfied in any
way with their present equipment—men who want a better
machine—will be especially interested in the Anderson auto-
matic.

One of the wonderful new features of this machine is the
automatic motor spring which is connected with the drive
wheels. It is so arranged that it does away with the old
back-breaking method of pulling a dead weight, furnishes
momentum on the cutting stroke and doubles the operator’s
capacity.

This machine has two detachable weights and may be
operated at 130 or 150 pounds. The knife clamp can be
adjusted sideways (for shearing cut) and up or down to fit
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.

The top illustration shows Trough Lath, bottom cut depicts Cup Lath. Samples and prices mailed upon request.

Sykes Metal Lath & Roofing Co.
Niles, Ohio

NOTICE CARPENTERS!
The Fifth Edition of
The Lightning Estimator
is enlarged and brought up to date. Teaches you to estimate housework, in an easy, rapid, accurate and practical manner. Gives actual cost of each separate part of the labor and material. Guards against errors and omissions. Based on actual experience, not theory. Quickest reliable method in use today. Now is the time to post yourself on this vital part of the business. Price postpaid, $1.00.
BRADT PUBLISHING CO.

FLY SCREENS and SCREEN DOORS
Made to order neatly and promptly. From a single screen or door to a thousand. Wire fastened by the most improved Standard Shoulder Strip Method.
Mr. Carpenter, Builder or Contractor, write for free copy of our 1909 illustrated catalog.
STANDARD SCREEN CO., 803-5 W. 14th St., Chicago, Ill.

American Sea Green Slate Co.
Box 36, Granville, N. Y.
This proposition only applies to territories not now covered by a Slate Roofer.

To take up Slate Roofing in unoccupied territory everywhere. Only a few inexpensive tools needed. Slating easy to learn.

Sea Green and Purple Slate Roofs
outlast any building. They won't wear out, rust or decay. Are fire-proof. Afford clean cistern water and don't require constant repairs and attention. A profitable, growing Slate Roofing business can be established anywhere. Besides new work, there are hundreds of wornout tin, shingle, metal and composition roofs to be replaced. Your neighbors are tired of paying out good money for short-lived roofings. Furnish them with handsome, sanitary, fire-proof "Never- wear-out!" Slate Roofs.

Carpenters and Builders: This is a money-making proposition, it costs nothing to investigate. LOOK INTO IT. WRITE TO US IMMEDIATELY FOR FREE BOOK OF INSTRUCTIONS AND PRICES ON SLATE AND TOOLS. WRITE TODAY.
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.

Unlatch the screen, swing it out, and the flies are outside the house. Brush them off and close the screen. Do this once a day and the house will be clear of flies.

Accessories and attachments that go with the Anderson floor smoother are the AAA knife sharpener, which produces a perfect cutting edge; the AAA smoothing shoe attachment, which produces a uniformly fine finish, and a handy tool kit including knives enough to scrape 60,000 square feet of floor.

Mr. Anderson has such confidence in his machine that it will "make good" on all he claims for it that he will send the machine for a free trial to all readers of the **AMERICAN CARPENTER AND BUILDER** who are interested. Write for further information, Triple "A" Machine Company, 1020 Chicago Opera House building, Chicago, Ill., U. S. A.

Massey's Lightning Grip Vise

The Massey Vise Company have recently perfected and patented the improved, parallel bar, lightning grip vise, illustrated herewith. The sliding bars of this vise at their rear end are connected with the stationary jaw by a carrier, which causes a perfect alignment of the two jaws.

The end to end connection of the sliding jaw with the stationary jaw makes the vise very durable and practically unbreakable. The movement of the sliding jaw is easy, quick, positive and a quarter turn of the handle firmly fastens the work between the jaws.

The Massey Vise Company, 208-210 Michigan street, Chicago, make two sizes of these vises, 8 and 10 inch jaws, further particulars of which they will be pleased to furnish to all readers of the **AMERICAN CARPENTER AND BUILDER**.

"Ideal" Hardwood Floor Scraper

Among the many new and important labor-saving devices manufactured during the past few years, is a machine for scraping hardwood floors. There is no branch of the carpenter trade so laborious as scraping floors by hand.

The "Ideal" floor scraper has several important features...
The Car For Service

McIntyre

Please do not judge the McIntyre Car by its low price. That is only an incidental feature.

If added expense could improve this high-grade car, we should not have hesitated to ask a higher price.

The McIntyre car gives its owner the utmost in long, hard service. Expense of up-keep is a negligible amount. Cost of operation, less than 1 cent a mile. Goes at any speed up to 30 miles an hour over country roads. It is an economy, convenience and source of permanent pleasure to its owner—always.

Ask to know more about the McIntyre car. We have 20 Models to show you, comprising a type for every commercial purpose. Send postal today for McIntyre Catalog No. 143.

ADDRESS NEAREST OFFICE

W. H. McIntyre Co., Auburn, Ind.
256-7 Broadway, NEW YORK CITY
1230 Grand Ave., KANSAS CITY, MO.
416 Third Ave., MINNEAPOLIS, MINN.
Tulhope-McIntyre Co., Orillia, Can.

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.

DIEHL'S No. 22 BASEMENT WINDOW HINGE

The only bracket hinges made. It acts as a hinge and at the same time is a ceiling hook. They are self supporting. It is only necessary to use the hinge and you have both appliances. They save time and labor. Try them.

DIEHL'S No. 19 BASEMENT WINDOW FASTENER

It acts as a wedge and forces the window firmly against the stops. Trying to open the window from the outside will have a tendency to lock it more firmly. Therefore it is an excellent safe-guard against marauders and the like.

DIEHL NOVELTY COMPANY
SHEBOYGAN, WIS.

ZIMMERMAN'S

SEE THIS FLANGE CANNOT SAG OR TWIST

Two bolts where the weight is carried. It does not require an expert to use a type writer. Any man can use one with slight practice. Ask your jobber or write us.

HARRY ZIMMERMAN & CO., Patentees,
25 Wood Street, FREMONT, O.
Eastern Selling Agents, O. F. S. ZIMMERMAN, 4 Arch St., Frederick, Md.

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
Genasco
Ready Roofing

Genasco is economical roofing.

It costs a little more in the beginning because it is made of Trinidad Lake Asphalt, the perfect natural waterproofer and weather-resister.

The thing that makes the first-cost more makes the last-cost less. And last cost is what counts.


THE BARBER ASPHALT PAVING COMPANY
Largest producers of asphalt and largest manufacturers of ready roofing in the world.

PHILADELPHIA
New York San Francisco Chicago

BUY A BOVEE FURNACE
Direct from the Factory
AND SAVE $50.00 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 way and make more than 30 different makes of furnaces. We furnish our customers with practically any size or style of furnace that may desire, either Upright or Horizontal, sufficient to heat a large church or school house, down to a cottage.

Trinidad Lake Asphalt furnace is made with all pipe, registers and fittings for $55.00. Our furnaces are the only furnaces having a perfect 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.

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
Mantels for Every Purpose

Original Ideas in Mantels suitable for Bungalows, Cottages, Concrete or Cement Houses.

Investigate our new Combination Mantel Fireplaces—ideal for Flats and Apartments.

Lorenzen Mantels are Ahead

The styles are modern—the designs are distinctive—the workmanship is better than other makes sold at higher prices.

Every mantel is made by experienced workmen from highest quality air seasoned lumber in various woods and finishes. The prices are as varied as the style—all the way from $3.00 to $250.00.

Our enormous stock is mirrored, and priced, in our catalog—the most magnificent ever issued. Send your name now and receive a copy as soon as it comes from the press.

Dollars for Contractors and Owners in Our Proposition

Our latest innovation, the combination Mantel-Fireplace, will coin extra dollars for mantel dealers. Something new, handsomer, richer, and vastly superior to any brick fireplace. We explain this to anybody writing. Write today.

LORENZEN

“The Mantel Man”

315 N. Ashland Avenue, Chicago

THE BRUSH RUNABOUT

No car in the world compares with the Brush Runabout in the economy of maintenance, or in the simplicity and ease of riding. We make these claims knowing our ground absolutely. They are based on facts we have proven during the many years we have been connected with the automobile business, as well as the two years we have been manufacturing and selling the Brush Runabout.

You are probably surprised at that statement. You may even say: "Why, I don't believe I ever saw one of your cars."

Well, don't doubt it, even though there are more than 2,000 of them in use. When you distribute that number over the United States and eleven foreign countries they can't be very thickly spaced in any locality.

But in a few months you will see the Brush everywhere. Watch for the little gray car with the black stripes—and you will always see it deliver the goods.

There is a larger demand for the Brush this year than we can supply, even though we are running our factories twenty-four hours a day. This we know.

We also know that the car is right, so it's only a question of increasing our capacity to meet this demand for a simple, staunch, reliable runabout which will do all that is demanded of it.

Please understand this isn't a speed car—one of the mile-a-minute kind. It's not an imitation of a big car, with the complications left in and the strength left out. It's a runabout.

When Brush designed it, he didn't waste a minute trying to copy any of the big cars. His experience had taught him that more is expected of a runabout than of a big car, and that's why he spent over a year on the original designs.

Don't lose sight of the fact that Brush is acknowledged to be the greatest of all small-car designers and that over twenty thousand automobiles of his design are in use.

Have you noticed what the foreign makers are doing? The manufacturers of such prominent makes as Renault, De Dion-Bouton and Darracq are building cars similar to the Brush.

No, possibly you are not interested in what the Frenchmen are doing; but you are interested in a tried and proven automobile that you can buy for $550—.

A car that will carry two passengers and baggage over any road (up Pike's Peak, if you want to go)—a car which is easily operated—one you can maintain for less than half what it costs to keep a horse.

If it were possible we would like nothing better than the opportunity to take you through our factories and show you how the Brush is made. This, with a chance to demonstrate the perform- ance of the car, would settle the question to our mutual satisfaction.

You know, we can sell you exactly the same car on solid rubber tires for $500.

BRUSH RUNABOUT CO.

761 Baltimore Ave., DETROIT, MICH.

Established 1906

BRUSH RUNABOUT

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
See Here!

Mr. Carpenter,

That trademark is something for you to remember, for every good live man wants and will have first-class tools, and experience has proved that the Simonds is the world’s best hand saw.

If you’re more than an average man, you’re looking for the best saw. Every hustler wants a saw with an edge that holds, and that’s the Simonds and you’ll always know it by the trademark.

That trade-mark means that this saw is MADE OF SIMONDS STEEL made especially for the Simonds Saw in Simonds Mills.

By our patented process, we get the most evenly and correctly tempered saw on the market. No one else can quite make it, they don’t know how. We are advertising, so you won’t forget the Simonds trademark.

If you will only try the Simonds Saw, you will agree with us, and the hundreds of Carpenters already using them, that Simonds Saws are The Best, And They ARE The Best.

Each Simonds Saw comes packed in a separate case. Remember the trademark when you buy. Every saw absolutely guaranteed free from imperfections in workmanship or material.

When you need a saw buy a Simonds. Let us know the kind and size you want and we will tell you the name of our nearest dealer and will also send you a free copy of “Simonds Carpenter Guide,” a useful and instructive booklet.

Simonds Mfg. Co.
Fitchburg, Mass.

Roofing Guide.” This roofing guide and their catalogue No. 108 are sent free to all requesting same. The Central Machinery & Supply Company are located at 2567 Archer avenue, Chicago, and are reliable in every way.

Window Washing Made Easy

We are living in an age of mechanical achievement. During the past twenty years our methods of living and working have been literally revolutionized and the “search of events” is making lighter the burdens of mankind and contributing to the comforts and happiness of life.

A unique little attachment has been sold quite extensively in Canada and is now being introduced into the United States by the Patented Window Attachment Company, 51-53 North State street, Chicago, Ill., owners of the rights for this country. Briefly described, the attachment consists of a set of hinges for each sash that are disengaged when not in use so that the windows operate as usual. Small pivots on each sash swing out and drop into small sockets fastened to the left hand side of the frame. These pivot-hinges bear the weight of the sash and permit its being swung out into the room, the right hand guide strip being removed. These strips are cut to a neat bevel and held in place by knurl screws so it is but a moment’s work to remove them. The counterweight rope at this side is fastened to the sash by a small hook that is easily disengaged, a device at the pulleys holding the rope in place.

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