August Special Features---

Success in Town Planning
WHAT HOME BUILDING UNDER RESTRICTIONS HAS DONE FOR GARY, IND.

Silos and Silo Building
TIMELY ARTICLE FOR COUNTRY CARPENTERS ABOUT SILAGE AND WOOD SILO CONSTRUCTION

Ornamental Gates and Fences
DETAILED DRAWINGS OF SIX ATTRACTIVE DESIGNS

Full Set House Plans
STEEL SQUARE FRAMING—AMATEUR SHOP WORK—MACHINE WOOD WORKING SMALL HOUSE AND BUNGALOW DESIGNS
Two Famous Silver Steel Saws

We want to call particular attention to the two Saws shown in the pictures below. Both blades are of SILVER STEEL—both are Taper Ground—both are genuine ATKINS SILVER STEEL SAWS—but the handles are constructed on entirely different principles.

No. 53—Genuine Perfection Handle.
No. 51—Old Style Handle.

"Pay Your Money and Take Your Choice"

ATKINS NO. 53.
The picture to the left shows ATKINS NO. 53 SILVER STEEL SAW equipped with ATKINS Genuine Perfection Handle and illustrates plainly why this type of handle is easiest on the saw arm. While it may feel strange to the beginner—a few days use will demonstrate that the Perfection Handle is the most scientifically constructed and much easier on the saw arm than any other style.

Note the line running through the saw arm straight through the blade to the cutting edge. See how every ounce of power is directed to the point of contact. Observe the wrist and saw arm, how easy and natural the blade drops into its work without pressure.

If you do not wish to try the Perfection Handle, then try the No. 51. Either of these saws or any of our other popular numbers may be purchased through your regular dealer, who should order for you from his wholesale house in case he does not carry them in stock. If he will not order for you, let us know and we will see that you are taken care of. Be sure to see that our name, E. C. ATKINS & COMPANY, and the words "SILVER STEEL" are on the blade. None other are genuine.

OUR FREE OFFER

We are securing the names of high class mechanics who appreciate fine tools and if you will send us ten cents in stamps to pay postage, we will mail you one of our fine carpenter’s nail aprons Saw Sense Book, Time Book, and a great deal of useful information on the purchase and care of saws. Write to-day and learn "Who's Who" in the saw world.

E. C. ATKINS & CO., Inc.
INDIANAPOLIS, IND.
SAW RIG

Put this portable saw rig on your job or in your shop. A complete and economical operating mill which requires no line shafts or large amount of floor space.
Will rip 2 inch lumber and cross cut 3 inch lumber.

GUARANTEED FOR LIFE

HOIST

This Builders' Hoist is the cheapest and best hoist on the market today. All gears are machine cut, which makes it a simple, noiseless and reliable outfit that can be depended upon and pay for itself on one good sized job.

Hoist furnished Gasoline or Motor Drive.

WRITE FOR OUR ATTRACTIVE FOLDERS

Portable Saws and Builders Hoists

GEORGE D. SMITH

814 FISHER BLDG., CHICAGO, ILL.
The American Floor Surfacing Machine

IS NO EXPERIMENT. Its work since 1903 has established a standard for finely surfaced and polished floors. It is the only machine whose work is specified by leading architects and used in the best government buildings and will surface and polish any kind of a floor from common pine to the finest parquetry.

IT IS THE ORIGINAL and only two-roll, self propelled, dust collecting machine, that surfaces close to the wall and can be used in small rooms. Anyone can operate it.

ITS WORK IS RAPID, regular smooth and even because the power that drives the rolls, also propels the machine at the same ratio of speed. It has surfaced and polished millions of square feet of the finest floors in America and Europe.

GET A MACHINE that does first class work and in paying quantities, that is fully guaranteed and sold on its merits.

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Manufactured By The American Floor Surfacing Machine Co., TOLEDO, O.

We Make Panels of any Thickness and Any Kind of Wood — Curved or Flat.

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Ceiling
Mantels
Doors
Counter Tops
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Our products excel in Quality and Durability, because we concentrate our best efforts in their manufacture. We specialize in Panels and have the facilities for producing best results. Try us with your next order. Send us your specifications and ask for our prices.

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Specialists and Manufacturers of Built-up Veneer Panels

We appreciate small orders as well as large ones

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Its Work is to Make Openings in Doors for Mortise Locks.

The time is Three Minutes. The Material is Hard, Soft, Gross Grained and End Wood.

The job is clean, true and parallel with sides of door. The labor is performed with slight exertion. The care is practically none, as the tool does not get out of order. The adjustment is done in a moment's time for the different sizes. The cutters are five in number and cover locks from 4 inch to 14 inches thick. Thin doors are handled as easily as thick doors.

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Sold only on its merits. A request brings it to your door, freight prepaid. Try it out, if you are convinced it is the best floor scraper on the market, pay for it. If not, return it at our expense.

The Little Giant has scraped millions of square feet of floors. Cuts right up to the baseboard and into every corner. Easy to operate. Will scrape floors quicker, cleaner, and cheaper than any other machine on the market.

Ask us for our special price on this machine.

Hurley Machine Company

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DETROIT: 246 Woodward Avenue.

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Durability and absolute accuracy are notable qualities of Smith Tenoners.

The frame is cast in one piece insuring rigidity.

The Table is mounted on roller bearings, moves very easily and is perfectly "square" at all times.

The Cutter Spindles are all made of high carbon steel, ground accurately to size and perfectly round. Machines are built in several styles.

We also build double-end tenoners. Correspondence invited.

SMITH MACHINE COMPANY
SMITHVILLE, N. J.
The WEBER actixe Floor Scraper

Try It Five Days FREE

Send for this scraper. Take it right out onto the job. Put it up against any other scraper made—on any kind of flooring. If its work isn’t better in every way, return it.

Write Me Now

I also sell Wax Polishers, Saw Filing Vises, Cabinet Scrapers, Double-Folding Scaffold Brackets, etc.

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JOHN F. WEBER, Pres.
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It is Yours For The Asking

To Try it For One Week

No “If’s” or “Ands” about my offer. It is a straight business proposition and one that I have adopted to make sales. It is impossible for me to send a representative to every contractor interested in a floor scraper, so instead, I send the Acme Floor Scraping Outfit to represent itself.

I allow you to work with the machine for one week and if at the end of that time, you are not satisfied with the results and do not consider the Acme Floor Scraping Outfit the best equipment on the market, simply pack it up and ship it back to me at my expense.

Does this sound like an offer that is worthy of your consideration?

Further particulars and catalog on request.

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The Planes illustrated above can be used for many kinds of work, such as Rabbeting, Matching Chamfering, Tonguing and Grooving, etc.

Send for Catalogue No. 34 which contains a complete description of these Planes as well as many other tools of interest to Carpenters.

Reasons Why this Machine Appeals to Carpenters, Contractors, Builders and Retail Lumbermen:

1st—Occupies small space. 3d—Under instant control.
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will do all kinds of planing and jointing to better advantage than a big machine. The price is so reasonable that the ordinary Carpenter or Builder cannot afford to be without it.

Write for full description, price, terms, etc.

J. A. FAY & EGAN CO.
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Start out With Two Real Machines that are Always Ready for Work.

[Save time used in making changes on light inferior machines, known as “Wood Workers.”]

MACHINE No. 1
Chicago No. 5 Combination Saw Table

Used for Cutting Off, Ripping, Mitering, Grooving, Boring, Tenoning, Etc.

MACHINE No. 2
Chicago 12" Jointer and Planer

Send for our Special Catalogue today. We issue a catalog of machines especially adapted to Contractor’s and Builder’s use.

These Two Machines for $170.00, including belt for saw arbor, countershafts, 1 14" rip saw, 1 14" cut off saw, 5 boring bits—1", 1/2", 1/4", 1/8", 1/16" and 1 pair of jointer knives. Ask for price on one if you cannot use both.

Chicago Machinery Exchange 1219-1227 Washington Bowl, CHICAGO, ILL.
Big, Practical, Up-to-the-Minute Book
For Contractors, Builders, Cement Men

"Cement and How to Use It" is a big, practical, up-to-the-minute book for the cement manufacturer, dealer and user, as well as the architect, draftsman, construction man, contractor, builder, carpenter and prospective home owner. This book contains the boiled-down essence of all the accurate information on the subject of "Cement and How to Use It" possible to obtain. It is indispensable to the man who in any way has anything to do with construction or the use of cement in any one of its multitude of applications.

370 Pages—350 Illustrations—2,000 Topics

Every phase, part and use of this wonderful twentieth century building and paving material is treated fully and completely, with details showing each step to be taken.

This book contains only practical information. By practical is meant information that can be successfully applied to the every-day work of the average builder, contractor and cement user. The book presents and solves problems as they have been met and worked out by well known architects and the man on the job.

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FREE WITH ONE YEAR'S SUBSCRIPTION TO CEMENT WORLD
"THE WORLD'S GREATEST CEMENT PAPER."

USE THIS COUPON—PIN $1.00 TO IT—AND MAIL TODAY.

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Gentlemen:—Enclosed find $1.00 for which enter my subscription to the Cement World for one year, and send me, absolutely free, postage prepaid, one copy of the big, new 370 page book, "CEMENT AND HOW TO USE IT."

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The information about Horse-power required for driving the different machines should be especially valuable to you. It tells all about our line of Band Saws, Saw Tables, Shapers, Jointers, Variety Wood Workers, Planers, Swing Saws, Disk Grinders, and Bores. We have a copy all ready to be sent to you and it will go forward on receipt of your name and address.

The Crescent Machine Company
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LEETONIA :: OHIO

The Cost of Repairs

Should be given serious consideration by purchasers of Concrete Mixers.

Do a little thinking for yourself.

Profit by the experience of others.

Save time lost and money spent for upkeep, by buying the best.

THE COLTRIN CONCRETE MIXER

Manufactured by
The Knickerbocker Co.
JACKSON, MICHIGAN

Sidewalk crew of F. L. Holt, Limon, Colorado

Limon, Colo., June 20th, 1911

The Cement Machinery Supply Co.
Denver, Colo.

Dear Sirs:

I have operated the No. 12 Coltrin Mixer for the past year without one cent of expense for repairs. I consider it has no equal on the market.

Very respectfully,

F. L. HOLT.
This Bar is No Experiment

The Petz Bar for modern store front construction has proved its superiority. You don't have to use it on our "say-so". It has "made good" in thousands of cases, and shown itself to be safe, strong, and sure.

It is easy to install, is stylish and artistic in appearance, will not break the glass, and gives perfect ventilation. It is the bar to use if you want to be sure of satisfactory results.

Write for our new booklet on "Modern Store Front Construction", or explain in detail your requirements, and we will gladly give complete information about the different styles of Petz Bars.

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The Acknowledged Exponent on Band Saw Talk.

Would be mailed free.
Send for a copy before our supply is exhausted.

We illustrate fifteen new model machines.

Here is one, $95 net, complete with all improvements as shown in cut. If you want a machine to show economy in the general wear and breakage of saws here you are. Our catalog will tell you all about it.

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THE FOLDING DRAW KNIFE
These are handles that are rigid
On a blade that's always keen.
They are set at any angle
Why, it's sold as soon as seen.

If your hardware dealer does not keep it, we will send it to your address postage paid.

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Over 25 years ago we commenced to make the Self-Setting Planes. They are sold in every state and Canada. Thousands of carpenters use them doing work easier, better, quicker, saving time, trouble and temper.

Every issue of this paper has had our ad. In it. If not sold in your town, we will send you a new wood plane on trial on receipt of one dollar less than list price, and if you return it at our expense within 30 days of receipt we will refund your money. If you want more than one we will allow you 'dealers' discount.

In writing, if you mention this paper and send us the addresses of 10 plane users—no matter where they live—we will send you a carpenter's hard tough pencil.

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Write Us Now For Free Samples of Johnson's Artistic Wood Finishes

Wood Dye is not a mere surface stain—but a deep-seated dye, penetrating the wood and fixing a deep, rich, permanent color entirely different from ordinary stains, which are only "skin-deep."

Made in the following fifteen attractive shades.

No. 126 Light Oak No. 131 Brown Weathered Oak
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No. 119 Big Oak No. 172 Flemish Oak
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When used with Johnson's Prepared Wax or Johnson's Under-Lac, inexpensive soft woods such as pine,fir and cypress, may be made as beautiful and artistic as costly hard woods.

Ask your dealer for free samples of any shade of Johnson's Wood Dye and Test it, or write us and we will send them from Racine. Free Instruction Book, Edition A. C. 8.

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MAYHEW 60° MITRE BOX

This box embodies more distinctive features than any other made.
Designed for Simplicity, Accuracy, and Durability.
Strictly a right hand tool for mitering.
Box embodies a new feature in reversing the principle commonly used on other boxes.
Any of three saws may be used — Panel — Hand or Back saw.
Saw guide adjustable for any thickness of saw.

Extreme mitre to 60° without makeshift. May be used as a stationary or pivot box by use of the pin posts.
In mitering duplicate cuts there is no restriction on length.
Will cut compound mitre.
Parts take down into space 10x10x4 inches.
Weight 15 lbs. complete.
Box contains full directions for use.

PRICE EACH, $10.00

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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 "C."

GOODELL MFG. CO., Greenfield Mass.

"SEAVEY" MITRE BOX
Meets Every Requirement

Special Offer
On return of this "Ad" and $2.00 one of these Mitre Boxes will be shipped to any reader of "Carpenter & Builder." Offer good for 30 days from date of issue.

Portable — Can be carried in the Tool Kit

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THE LUFKIN RULE CO.
SAGINAW, MICH.

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DO NOT BE DECEIVED

As to the Patent Situation on Asbestos Shingles

Some of our competitors have been misrepresenting a decision and injunction obtained from the United States Courts alleged to prevent us from selling Asbestos Shingles.

Read the Latest Injunction Issued by the Court

THE PRESIDENT OF THE UNITED STATES
to
ASBESTOS SHINGLE, SLATE & SHEATHING COMPANY;

GREETING:

WHEREAS, it has been represented to us in our Circuit Court of the United States for the Southern District of New York that you, the said Asbestos Shingle, Slate & Sheathing Company, have misrepresented to the public the force and effect of a certain interlocutory decree entered by said court on the 16th day of February, 1911, in a certain suit brought by said Asbestos Shingle, Slate & Sheathing Company, and Ludwig Hatschek, against the H. W. Johns-Manville Company, and also the force and effect of our writ of injunction issued thereunder on the 18th day of February, 1911.

NOW, THEREFORE, we do strictly command and enjoin you, the said ASBESTOS SHINGLE, SLATE & SHEATHING COMPANY, from in any way advertising in words or in substance that this court has held that any cement shingles hitherto made and sold by the defendant, H. W. Johns-Manville Company, infringe on any of the claims of the patent in said suit, or from issuing any circulars or in any other way publishing abroad or saying, or writing, that this court has held that no cement shingles can be purchased except from the complainant, or that all the claims of the complainant were upheld by the interlocutory decree herein, or in any other way misstating the effect of the said decree, or of publishing the whole or any part thereof or the substance of the same, so that it shall mislead any reader as to its meaning or effect, and

We do further strictly command and enjoin you, the said ASBESTOS SHINGLE, SLATE & SHEATHING COMPANY, that whenever you shall advertise the interlocutory decree of this court entered in said suit, or any part thereof, or the substance of same, in connection with the words "cement shingles" or "asbestos shingles" or the like, that in every such case the said advertisement or circular or other means of publication shall make equally salient to the eye the fact in substance that the said decree of this court forbid the making, vending or using of cement or asbestos shingles or the like, made upon a paper-making machine, and that said advertisement shall nowhere contain any statement that the decree of this court forbade the making, vending or using of any cement or asbestos shingles unless such statement be accompanied as aforesaid with the statement in substance that the said shingles so forbidden are those made upon a paper-making machine.

WITNESS THE HONORABLE EDWARD D. WHITE, Chief Justice of the Supreme Court of the United States, at the City of New York, on the 1st day of June, 1911, and in the hundred and thirty-fifth year of the Independence of the United States.

JOHN A. SHIELDS,
Clerk of the Circuit Court.

We have been and are selling shingles which do not infringe our competitors' patents because they are made by a new and better process, covered by letters patent which we control.

J-M Transite Asbestos Shingles are not Made Like Paper on a Paper-Making Machine

The facts are that if you want Asbestos Shingles made on a paper-making machine, you must secure them elsewhere. We do not make that kind. But if you want the latest and best form of Asbestos Shingles made by the most improved methods, you can get them from us and no one can stop your using them.

Advise Us and We Will Protect You

We shall appreciate any information you can send as to any violation by our competitors of the above injunction.

H.W. JOHNS-MANVILLE CO.
Manufacturers of Asbestos and Magnesia Products

Baltimore Boston Cleveland Los Angeles
Chicago Dallas Detroit Milwaukee

London New Orleans Philadelphia St. Louis

For Canada—THE CANADIAN H. W. JOHNS-MANVILLE CO., Limited
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The general appearance of this Brace rejoices the lover of fine tools. The metal parts are handsomely nicked and the head and handle are of highly finished cocobolo. Both head and sweep-handle are ball-bearing, reducing all friction to a minimum.

All ratchet parts are covered and in that way protected from dust. The ratchet teeth cut directly upon the base of the tail socket, in a manner least likely to get out of order.

It is impossible for the chuck to work loose, whether the ratchet is worked left or right, because of the manner in which it is attached to the sweep by a flat head machine screw and a patent washer, which is in the shape of a shallow cup.

It is in the chuck, the most vital part of any bit brace, that Millers Falls skill in brace-making has culminated. The sleeve is of a new pattern, just fitting the hand, and is reinforced at the lip to meet the strain at that point. The tail socket is made from solid bar steel, unbreakable under the severest usage. The jaws are so hinged upon a spring as to transmit any strain to the stout sleeve.

The jaws open parallel and close to conform to the shape of the bit used. Three grooves cut lengthwise in each jaw, making eight points of contact, insure the tenacity of grip.

The Master Brace is made in 4 sizes, with 8, 10, 12 and 14 inch sweep.

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304 Pages of Tools

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"A Bit Of Utility"

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

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

Unequaled for Delicate Work

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

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

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WOOD WORKING MACHINERY

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Write for Catalog: Showing Our Line of Machinery for Carpenters and Builders.

Universal Woodworker.

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Another New

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"Quick Return" No. 130

Same as the No. 30, but with a Spring in the Handle that drives the Spindle back, ready for the next push. A great advantage for overhead work or where only one hand can be used. Takes all the Attachments used in the No. 30.

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There are 35 Styles and 75 Sizes each a Labor Saver. Our New Yankee Tool Book tells about them. A postal brings it.

Your Hardware Dealer Sells the "Yankee"

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"GRAND RAPIDS"
ALL STEEL SASH PULLEYS

No Nails No Screws
Just Bore 4 Holes

The time saved by the "Grand Rapids" will actually pay for the pulleys.
You can't afford to use old style pulleys.
Write for free samples and prices.

Grand Rapids Hardware Co.
Manufacturers
111 11th Street, GRAND RAPIDS, MICH.

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Cornices, Store Fronts, Steel Ceilings, Deck Railings, Crestings, Etc.

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We Want a Builder
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We Have An Attractive Proposition For One Carpenter
Or Builder In Every Community To Take Orders For
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ARE EASILY SOLD BY OUR AGENTS
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ARCHITECTS EVERYWHERE SPECIFY THIS ATTRACTIVE ROOFING

Edwards' Metal Tile are stamped out of the highest
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THE WORLD'S LARGEST MANUFACTURERS OF METAL ROOFING, METAL SHINGLES, AND METAL CEILINGS

$42 Will Put Running
Water in Your Home

This system will supply running water to your laundry,
kitchen, bathroom, garden and barnyard.
Water supply systems of every size operated by hand
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$38.95 Buys this Com-
plete Bathroom Outfit
The luxuries of modern
plumbing at half the ord-
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Gasoline Engines for gen-
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Save $100 to $250 on
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Hydraulic pumps, Pumps,
Pipe, Valves, Fittings, at
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All high-grade
strictly guaranteed goods.

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CONSOLES
Columns and Grilles

In quality and price our work is not surpassed.

You will make no
mistake in writing
us before ordering
elsewhere.

Send for 36-
page Catalog
No. 16

It contains many
fine designs of mod-
ern Grilles, Columns
and Consoles.
The Perfection Universal Mortiser

For Door Locks, Sash, Sash Pulleys, Screen Frames and Cabinet Work. Instantly changed with screw driver, from round hole to ANY size mortise up to 6". Finished perfect, WITHOUT THE USE OF BRACE OR CHISEL. Made of Malleable. Automatic and ball bearing.

MANUFACTURED BY PERFECTION MFG. CO. COLUMBUS, OHIO

PHOENIX INSIDE SLIDING BLINDS

WILKES BARR, PA.
The Phoenix Sliding Blind Co. Enclosed find my check for blinds. I am pleased with them and sorry I did not have them put throughout the whole house.

Com'on! Economy! Convenience! PHOENIX SLIDING BLIND CO. BRIDGE & CANAL STS. PHOENIX, N. Y.

ASHLAND Folding Scaffold Bracket

Best and strongest bracket made. Used on any kind of siding. Adjusts to any space in studding or pitch of roof instantly. Just the thing for carpenters, joiners, painters, and brick masons. Folds instantly. No pipes or bolts used in adjusting. One bracket easily carries 1000 pounds put up on 4-10d nails. No contractor can afford to be without a set. Every man who uses them orders again. Pay for themselves on first two jobs in time and material. For prices and information, write.

Elite Manufacturing Co. Ashland, Ohio

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**THE SEVENTH FEATURE**

contributes to the high quality of

**RUSSELL JENNINGS BITS**

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**Master Hands**

know no compromise in results—hence make no compromise in choice of tools.

The masters choose

**The IRWIN**

REG. U. S. PAT. OFF.

Auger Bits for the truer, cleaner work they do. The better the Auger Bit the better the work—master or novice.

Imitations of the Irwin are in name, imprint and general appearance only—not in quality—not in results.

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**The Irwin Auger Bit Co.**

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Next machine you buy, order a

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to drive it individually.

You will be pleased.

You will be gaining some profitable experience in economy.

Ask

**ROTH BROS. & CO.**

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**Richards Ball Bearing Hangers**

for your garage job.

Tell us your needs.

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It has come to our notice that in several instances parties representing themselves as our authorized agents have taken subscriptions to the American Carpenter and Builder and have failed to turn over either the order or the money for it to this office. Subscribers can protect themselves by insisting on seeing the credentials of anyone soliciting their subscriptions. All authorized agents of the American Carpenter and Builder are provided with official receipts from this office; and to protect yourselves you should see to it that agents give you such a receipt for any money turned over to them.

Stop! Look! Listen!

A FAMOUS attorney, counsel and advisor for an Eastern railroad was asked to get up a form of danger signal to be placed at every country crossroad along the right of way. Death losses and damage suits are expensive. The attorney was instructed that whatever he submitted must be short and to the point, a warning that would command attention. He finally submitted the three words, STOP! LOOK! LISTEN! and since that time those words have greeted the eye of every passerby at every railroad crossing.

The majority of people do not believe in signs, but here is one that it will pay each and all to observe to the letter and then consider well. For unless we stop! look! listen! we will come to the crossing of success or failure and be hit by the express limited known as time. It will not be a case for the coroner or brainy attorney, and the only damages that can be collected will be the regrets of having missed the sign of the times, gather the harvest while you may.

In other words, while one has youth, strength, ambition and perseverance, he should be using every moment, when not actively employed in the pursuit of his daily labor, in studying himself and fitting himself for more productive fields of endeavor. Stop and consider; look for opportunity for improvement of mind and body; listen to advice and counsel from those who have made a success of their own particular vocation.

No man ever reached the acme of perfection by getting just a smattering of what he chooses to make his life work. The mind must be surcharged with the idea of learning some new part of this or that business or profession each and every day. As opportunity is presented for the display of talent, the mind and body must have been prepared to meet the emergency and be equal to the occasion. Would
Home Building Under Restrictions

HOW NEW TOWNS OR SUBURBS MAY BE BUILT UP MOST ATTRACTIVELY PROVIDED EVERYTHING IS PLANNED OUT IN ADVANCE AND BUILDING RESTRICTIONS ENFORCED

By Will L. Hammons

We hear a great deal about the "Garden Cities" of England—Hampstead, Letchworth, Port-Sunlight, Earlswick, Bournville and other small suburbs or residence sections built adjacent to manufacturing plants. Picturesque and attractive as these English villages are, they are made up mostly of small cottages; and the main feature is the exceeding beauty which is contributed by extensive gardening, which fills every little space with blooming flowers and climbing vines.

The building up of modern, attractive residence sections and villages is no doubt carried on more extensively in England than in America; but in the building of Gary, Indiana, the United States Steel Corporation has far exceeded in magnitude, cost and modern improvements any other made-to-order city in the world.

Believing that a city, like a house, should have a definite plan, this company first planned its future industrial city with the same care and modern scope that it did its great structures for the manufacture of steel and steel products. Broad paved business streets, ample for the traffic of a large city, were planned; residence streets, surrounding large open parks, were laid out; all modern municipal improvements were considered, and restrictions for the building of both residence and commercial structures were first provided before actual work on the city was begun. With this definite line of thought, definite plan of operation and careful provision for future development, the great enterprise of building a modern industrial city is being successfully accomplished at Gary.

Less than five years ago the site of the present city was a vast section of sand hills and swamps, considered practically worthless. But the United States Steel Corporation saw in this land an ideal location for its great plant for the Middle West, with excellent transportation facilities both by land and water. Twelve thousand acres were purchased; $150,000,000.00 appropriated for the building of the plants and city; and an army of men set to work clearing the land, grading high sand hills, filling deep swamps and building miles of sewers, streets, and sidewalks.

All sewers, sidewalks, streets, and gas, water and
electric systems were built by the Gary Land Company, a subsidiary company of the Steel Corporation. The largest sewers are seven feet in diameter and are of concrete; a concrete tunnel six feet in diameter and three miles long supplies the city with lake water.

The most important feature of the new city from a civic point of view are the restrictions governing the building of homes. The Gary Land Company owned and controlled the main part of the city, known as the First Subdivision, which is two miles square. In order to carry out its ideas of making the city the most modern and attractive, it was necessary that the company control the selling of residence and business lots, and also the building of the municipal improvements.

In order to prevent purchasers of property from holding the vacant lots as an investment for increased values, every lot is sold with a contract compelling the purchaser to build within eighteen months. Not only must he improve the property, but the structure which he erects must meet the approval of the Gary Land Company. Ever since the city was started the great demand has been for homes, and although hundreds of residences and flats have been erected, each year the demand has always been greater than the supply.

The cost of the building which the purchaser must erect is governed by the location and the cost of the lot. In most cases the cost of the houses erected has been in excess of the price limit made by the land company. Citizens and investors have entered into the spirit to make the city an attractive residence place, and it is this civic pride that is making Gary the most modern and homelike industrial city in the country.

All houses erected must be of at least two stories and basement, of plans approved by the land company; and deeds are not given to the property until the building is completed or far enough along to show that the requirements will be included in the completed structure. An established building line is provided, which is 25 feet from the sidewalk. From the property line to the curb is sixteen feet for sidewalk and parkway, which must be improved by trees and lawn.

Contracts for the purchase of residence lots provide that no structures shall be erected thereon for business purposes. This insures strictly residence sections, and prevents unsightly commercial structures being erected on choice corners of any residence street. All residence lots are 30 feet wide by 125 ft. deep.

In all of our cities and towns the appearance of otherwise attractive residence streets is spoiled by un-
sightly business buildings occupying corner lots, shutting off the view in the entire block and interrupting at the very beginning any building line that may have been established. With all corners occupied by modern dwellings, surrounded by trees and flowers, the residence streets are more exclusive, homelike and attractive.

Nature offered practically no aid at the start in making Gary an attractive city. The whole aspect of the entire section was of necessity changed by grading down the sand hills and filling the swamps. Most of the trees, small scrub oak, which were originally found, had to be cut down in bringing the land to an established grade. In the matter of soil for lawn and gardening purposes the natural resources offered nothing. Lake sand covered the site of the entire city and extended a hundred feet below the surface.

Unaided as they were by natural resources, the Gary Land Company, property owners and city officials worked together to beautify the landscape. Thousands of trees and shrubs have been planted, trainloads of rich black soil brought in to cover the sand, the lots and the parkways along the sidewalks beautified with lawns; public parks laid out and improved; and civic pride is behind a general public movement that will change this once waste and barren section into a picturesque and beautiful industrial city.

Up to last spring some property owners had not improved the parkways along the sidewalks with trees and lawns. These barren spots not only handicapped the "city beautiful" movement, but also allowed the sand to blow on adjoining lawns. Accordingly an ordinance was passed by the city council providing for the planting of trees by special assessment. Contracts were let for the planting of trees and lawns in all unimproved parkways, and the cost assessed against the property. This tree planting assessment is the same as made for any other public improvement, and the property owner has ten years to pay for such work. This prevents the selfish interests of any individual from interfering with the plan of making the beautification of the residence streets complete.

Several added inducements are offered property owners to make their surroundings as attractive as possible. Free water is given during the proper season for sprinkling purposes. Prizes are offered each year for the most attractive lawns, both front and rear. Advice and information as to the best kind of trees, flowers and shrubs to plant is given by the landscape department of the land company. For lots that have been covered with black dirt previous to selling the price of this improvement is included at cost.

Both the East and West side residence sections center about large parks of about twenty acres each. At a cost of thousands of dollars these parks have been covered with soil, trees and shrubs set out, winding sidewalks built and everything done that would be an impetus to the general beautification of the city.

Restrictions also govern the sale of lots on the business thoroughfares. The purchaser of business property must erect at least a two-story structure of ap-
proving architectural style within eighteen months. The contract also provides that no building erected shall ever be occupied by a saloon or business for the sale of intoxicating liquors. At the present time there are only two saloons in the First Subdivision, and at no time will there be more than five.

The alleys through the residence sections are twenty feet wide and contain the electric light poles, gas and water mains and sewers. Telephone wires are placed in underground conduits. The placing of these improvements in the alleys makes the streets more attractive and prevents the tearing up of the pavement for repairs and connections. The alleys in the business sections are brick paved, with three-foot cement sidewalks on both sides.

During the first year in the building of Gary the United States Steel Corporation erected seven hundred houses for its employees. These houses, modern in every respect, were of frame, brick and stucco construction, ranging in cost from $2,500.00 to $15,000.00, the average being about $3,500.00. In style, arrangement and construction they set a good example for the hundreds of other houses erected by private individuals. Variety of architectural styles, keen rivalry for attractiveness in design and home-like surroundings; and the deliberate encouragement of the art of architecture have resulted in the production of new developments in home building.

This general building of homes worthy of the name, results in a widespread interest in town improvement, giving adequate expression to the greater collective needs of the citizens in their public buildings, public parks and municipal improvements. The "City Beautiful" movement is receiving marked attention in all sections of our country at the present time; but the carrying out of such ideas is much more difficult in old established towns than in newer ones. In a new city like Gary, carefully planned in advance of active building, the attainment of a culmination in town planning and beautification is more easily accomplished.

**Felling Chimneys with Fire**

An interesting method of felling lofty chimneys is practiced in England. The originator of this method, a Manchester man, is credited with having felled, without accident, more than 100 chimneys which for one reason or another had become useless. Some of these were from 200 to 250 feet in height. The method consists in removing the stones or brick near the foot of the chimney and substituting an underpinning of wood, which is afterwards set on fire. About two-thirds of the area of the base is removed up to a height of 5 or 6 feet, so that most of the weight rests upon the underpinning. Experience has shown that when the work is properly done the chimney leans slightly toward the side where the underpinning is inserted, and when a slight crack appears in the masonry on the opposite side the time has come for the fire to be applied. As the chimney falls it partially telescopes in consequence of the shock produced by dropping into the void left by the burned timbers.
Silos and Silo Building

A PRACTICAL ARTICLE OF TIMELY INTEREST TO ALL COUNTRY CARPENTERS AND BUILDERS—CONSTRUCTION OF "KING" WOODEN SILO IN DETAIL

For over a quarter of a century the subject of silos and ensilage has been before the American people. At first, extravagant claims were made by some of its most enthusiastic advocates. As a result, many of the conservative and more practical farmers would not give it serious consideration.

But silos and ensilage have outlived their most zealous friends and advocates; and have come to be regarded as an indispensable adjunct to successful farming.

Silage as a Feed

The verdict is practically unanimous among all dairymen, who have fed good silage, that it is the best winter feed they ever used as a substitute for hay or corn fodder, and that they would not think of doing without it. It is relatively cheap, deteriorates but little with age after the first unavoidable changes have occurred, is compactly stored, easily fed and so thoroughly relished by the animals that there is no difficulty in inducing them to eat all they are able to assimilate.

Proper Size of the Silo

The dimensions of the silo should be determined by the number of animals to be fed and by the length of time it is desired to feed silage. The number of animals to be fed should determine the diameter of the silo, and the length of time silage is wanted should determine the height of the silo. The amount of silage to be fed per cow should first be determined. It should be determined whether each cow is to have 20, 30, 40 or 60 pounds per day. Then having decided this point, make the diameter of the silo such that by feeding the cows so much per day the silage can be fed down 1½ to 2 inches per day. This will prevent molding of silage. If a silo is made too large in diameter, and this is the most frequent error, one of two things will happen. First, the silage will be moldy all the time owing to the inability to feed it down rapidly enough or, second, the cows will be fed more than they should have in an attempt to keep ahead of the molding.

Where large cows are kept and it is expected to feed 40 or 60 pounds per cow daily, it frequently happens that it is desirable to cut down the silage ration. It is well to have the diameter of the silo small enough so that the ration can be cut down one-third or even one-half and still be able to feed down the silage 1½ inches daily.

In the dairy sections many farmers consider this point so important that they are building two small silos instead of one large one so that they can feed a light ration and still feed down the silage rapidly enough to prevent molding. In the older dairy sections where silos have been longest in use and dairymen have used up their first silo and are building the second time, they build two small ones in place of the one large one. They build smaller in diameter and higher.

Where the cows are getting 40 pounds of silage daily each cow should be allowed 4 to 5 square feet of feeding surface in the silo. Ten cows would require a feeding surface of 50 square feet. A silo 8 feet in diameter would have a cross section, or feeding surface, of 50 square feet. For ten cows therefore a silo should be 8 feet in diameter. Fifteen cows should have a silo 10 feet in diameter; 20 cows should have a silo 12 feet in diameter. The diameter of silos required for different numbers of cows is shown in the following table. It is assumed that each cow eats 40 pounds of silage daily.

<table>
<thead>
<tr>
<th>Number of cows in herd</th>
<th>Silo 30 ft. deep, 24 ft. of silage</th>
<th>Silo 36 ft. deep, 30 ft. of silage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fed down at rate of 1½ in. daily</td>
<td>Fed down at rate of 2 in. daily</td>
</tr>
<tr>
<td>Tons silage</td>
<td>Inside diameter</td>
<td>Tons silage</td>
</tr>
<tr>
<td>14.</td>
<td>36</td>
<td>36</td>
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<td>15.</td>
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<td>35.</td>
<td>126</td>
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<td>40.</td>
<td>144</td>
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<td>45.</td>
<td>162</td>
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<td>52.</td>
<td>180</td>
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<td>60.</td>
<td>216</td>
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<td>70.</td>
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<td>80.</td>
<td>288</td>
<td>288</td>
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<tr>
<td>90.</td>
<td>324</td>
<td>324</td>
</tr>
<tr>
<td>100.</td>
<td>360</td>
<td>360</td>
</tr>
</tbody>
</table>

For 180 Days
If the silage is fed down at the rate of 2 inches daily, this will be 60 inches or 5 feet per month. If it is desired to have six months feed then 30 feet of silage is needed, but after filling the silo the silage will settle 4 to 6 feet so that to obtain 30 feet of silage the silo must be 35 or 36 feet deep. A silo should not be less than 30 feet deep. The silage settles much better and keeps better in a silo 30 feet deep than in the shallower silos.

It is doubtful economy to build a silo more than 25 feet in diameter. Men who handle large amounts of silage and have noted carefully the labor involved are of the opinion that where the silo is more than 25 feet in diameter the extra labor of distributing the silage in filling together with the extra labor of taking it out more than offsets the advantage gained in economy of construction. Where larger amounts of silage are wanted it is the practice to put up several silos 20 or 25 feet in diameter.

With the modern machinery for filling the silo, that is, with the feed cutters with blowers, silos 50 feet in height are readily filled. The modern blower will lift the corn 50 feet high without trouble. It requires power, however, to run the blower. A blower which raises the corn 50 feet vertically will require as much, if not more, power than will the cutter. The old style carriers with rakes are run with less power, but these must be set at an incline which necessitates a long carrier for a high silo.

**Silo Construction**

In Bulletin No. 83 of the Wisconsin Experiment Station, Prof. F. H. King described in considerable detail methods of constructing round silos in wood, stone, brick and concrete. The type, however, that has come to be generally known as the King silo is the round wood silo made by bending ½ or ¾ inch sheeting horizontally, nailing it to 2 by 4 studding set 12 inches apart on the circular foundation.

The details of construction are as follows:

**The Foundation**

There should be a good, substantial masonry foundation for all forms of wood silos, and the wood work should everywhere be at least 12 inches above the earth to prevent decay from dampness. There are few conditions where it will not be desirable to have the bottom of the silo 3 feet or more below the feeding floor of the stable, and this will require not less than 4 to 6 feet of stone, brick or concrete wall. For a silo 30 feet deep the foundation wall of stone should be 1½ to 2 feet thick.

**The Superstructure**

The wood superstructure of the King silo has a wall 5 or 6 inches thick, whereas the foundation wall is 18 to 24 inches thick; it is evident, therefore, that there must be a shoulder of the wall 12 to 16 inches wide that must project either into the silo pit or outward beyond the sill. This shoulder should always project outward beyond the sill; for otherwise if the floor of the silo is 3 feet or more below the top of the wall this shoulder would interfere with the proper settling of the silage, allowing the silage to mold or rot just above the shoulder next to the sill and usually below the shoulder also. This rotting is commonly ascribed to the loosening of the sill or the foundation allowing air to enter. In most cases, however, it is plainly not due to this cause, but is due to the projecting shoulder which interferes with the settling of the silage. Many silos have been abandoned on this account so serious has been the loss from rotting. This shoulder should never project into the silo pit.

**The Sill**

The sill may be made by cutting 2 by 4's into two foot lengths and placing them on the wall flat side down. Or the sill may also be made by sawing short sections out of 6 or 8 inch plank, cutting them to the curvature of the circle. The latter is the better method since the outer sheeting is then nailed directly to the sill, insuring a tight joint, while the other way there are considerable spaces between the sill and the outer sheeting. These spaces admit air, so that the space between the studding is not a dead air space.

**Setting the Studding**

The studding of the all-wood round silo need not be larger than 2 by 4, but they should be set as close together as one foot from center to center. This number of studs is not required for strength but they are needed in order to bring the two layers of sheeting very close together so as to press the paper closely and prevent air from entering where the paper laps.

To stay the studding during construction a post should be set in the ground in the center of the silo long enough to reach about 5 feet above the sill, and to this stays may be nailed to hold in place the alternate studs until the lower 5 feet of outside sheeting has been put on. The studs should be set first at the angles formed in the sill and carefully stayed and plumbed on the side toward the center. When a number of these have been set they should be tied together by bending a strip of ¾-inch sheeting around the outside as high up as a man can reach, taking care to plumb each stud on the side before nailing. When the alternate studs have been set in this way the balance may be placed and toe-nailed to the sill and stayed to the rib, first plumbing them sideways and toward the center.

**Sheeting and Siding**

The character of the siding and sheeting will vary considerably according to conditions and size of the silo.

When the diameter of the silo is less than 18 feet inside, and not much attention need be paid to frost, a single layer of bevelled siding, rabbeted on the inside of the thick edge deep enough to receive the thin edge of the board below, will be all that is absolutely necessary.
on the outside for strength and protection against weather.

In applying the sheeting begin at the bottom, carrying the work upward until staging is needed, following this at once with the siding. Two 8-penny nails should be used in each board in every stud; and to prevent the walls from getting “out of round” the succeeding courses of boards should begin on the next stud, thus making the ends of the boards break joints.

When the stagings are put up new stays should be tacked to the studs above, taking care to plumb each one from side to side; the siding itself will bring them into place and keep them plumb the other way if care is taken to start new courses as described above.

Forming the Plate

When the last staging is up the plate should be formed by spiking 2 by 4's, cut in 2-foot lengths in the manner of the sill, onto the tops of the studs, using two courses, making the second break joints with the first. Or still better, the plate may be sawed out of 2 by 6 plank, cutting them to the circle, so that the sheeting inside and outside may be nailed to the plate to make a tight joint.

Where paper is used to make the joints between the boards air tight, it is extremely important that a quality which will not decay and which is both acid and water proof be used. A paper which is not acid and water proof will disintegrate at the joints in a very short time and thus leave the lining very defective.

The Roof

The roof of cylindrical silos may be made in several ways, but the simplest type of construction and the one requiring the least amount of material is the cone.

If the silo is not larger than 15 feet inside diameter no rafters need be used, and only a single circle in the center. This is made of 2-inch stuff cut in sections in the form of a circle and two layers spiked together, breaking joints.

The roof boards are put on by nailing them to the inner circle and to the plate, the boards having been sawed diagonally, making the wide and narrow ends the same relative widths as the circumference of the outer edge of the roof and of the inner circle.

If the silo has an inside diameter exceeding 15 feet it will be necessary to use two or three hoops according to diameter. When the diameter is greater than 25 feet it will usually be best to use rafters and headers cut in four circles 4 feet apart to nail the roof boards to.

The conical roof may be covered with ordinary shingles, splitting those wider than 8 inches. By laying the butts of the shingles %4 to %4 of an inch apart it is not necessary to taper any of the shingles except a few courses near the peak of the roof.

The ready roofings or prepared gravel roofing are preferred to shingles for a silo roof, since they make a tighter roof which retains the heat in winter.

Every silo which has a roof should be provided with ample ventilation to keep the underside of the roof dry and in the case of wood silos, to prevent the walls and lining from rotting. One of the most serious mistakes in the early construction of wood silos was the making of the walls with dead spaces which, on account of the dampness, lead to rapid “dry rot” of the lining.

In the wood silo and the brick lined silo it is important to provide ample ventilation for the spaces between the studs, as well as for the roof and the inside of the silo. A good method of doing this is, between each pair of studs where needed to have a 1½ inch auger hole bored just above the sill on the outside to admit air through the siding and sheeting. This should be covered with a piece of wire netting to keep out mice and rats. At the top of the silo on the inside a similar hole is bored under the plate through the inner sheeting. This arrangement permits the air from the outside to enter at the bottom between each pair of studs and to pass up between the studs and into the silo, thus keeping the lining and studding dry and at the same time drying the under side of the roof and inside of the lining as fast as exposed.

Where the winters are severe a word of caution is needed concerning this type of ventilation.

It will be readily understood that if these ventilators between the studs are left open in winter they will act as chimneys; they will maintain a constant draft between the studding, which will cool off and freeze the silage more severely than it would if there were no sheeting at all outside the studding. If the silage is for winter feeding, and 99 per cent of the silage is so fed, then care should be exercised to prevent this severe freezing. In order to do this, provision must be made for closing these ventilators both at the top and at the bottom, so as to convert the hollow wall into a real dead-air space. There is no need of building the wall air tight outside with two thicknesses of sheeting with paper between, unless there is provision for closing the ventilators in winter.

The development of the King silo came in response to an urgent demand for a type of construction that would avoid the corners and other serious and aggravating defects of silos, as previously constructed. It marked an epoch in silo building. Hundreds of silos of this type have been constructed. They have not been confined to Wisconsin, where they originated, but have been widely distributed. They have been in use the past ten years, and have demonstrated their success. They are no longer an experiment. However, the very wide and general use of this type of silo under a great variety of conditions of climate and local environment has brought out some of the demerits of this type of construction which at the outset could not have been foreseen. For instance, the wood lining has been found less satisfactory than cement, and hence it is recommended that these silos be cement lined. Many of the King silos are lathed and plastered and have proven very satisfactory, having done service for ten years.
Since the bungalow has become so popular in this country, there has come a demand for moderate priced but appropriate fences to enclose the gardens and yards adjoining these homes. The illustrations given are all of simple garden fences that are made attractive by the methods of construction and finishing, and by the placing of vines and flowers upon them. It is preferable to build fences marked by numbers 1, 2, 3 and 4, of undressed material, staining them green or brown. The fences shown at 5 and 6 would look better built of planed lumber painted white. These drawings of course, are only suggestive, for in the very nature of things, no two places require or will admit, the same design of fence.

Fence number 1 has 4 by 4 inch posts, spaced from 7 to 8 feet apart, with a 2 by 4 inch rail at the top and 1 by 6 inch board at the bottom. The lattice work is made of 1 by 2 inch strips, and placed about 8 inches on centers and nailed at each intersection. It is best to make this fence in panels before nailing them to the posts.

Fence number 2 has three rails, the two upper being 2 by 4 inches, and the lower one 2 by 6 inches. The pickets are made of 1 by 4 inch and 1 by 10 inch boards, every other picket extending the entire height of fence and the other pickets as shown on the detail. Fence number 3 is somewhat similar to number 1, except that the upper rail has a 1 by 4 inch apron, and the lattice work is placed diagonally and made of alternate pieces of 1 by 4 inch and 1 by 2 inch stuff.

Design number 4 is made in the ordinary manner, with one 2 by 6 inch and two 2 by 4 inch rails and alternate pickets of 1 by 2 inch and 1 by 10 inch boards. The latter have a 6 by 10 inch hole sawed in each board. A 1 by 10 inch board along the bottom, is provided as shown in the detail.

Fence number 5 is made of 1½ by 1½ inch dressed pickets, placed 1½ inches apart, and faced with a 1 by 12 inch board at the bottom. Four by 6 inch posts and two 2 by 4 inch rails are used in this design.

Fence number 6 is built up of 1 by 6 inch and 1 by 4 inch boards, arranged as shown in the drawing, with a 2 by 4 inch rail at top and a 2 by 6 inch rail at bottom. The tops of the 4 by 6 inch posts are pointed, as shown. All drawings are made to the scale of three-eights inch equals one foot.

Stop! Look! Listen!

(Continued from Page 27.)

You expect to accept the position of chief accountant of some great business house if you did not know a ledger from a sales-slip? Certainly not, for you would look like the small boy who tries to wear his father's clothes. You would be smothered in no time.

Most persons think opportunity is made one must fit himself into the position. The case is exactly the reverse. Fit yourself for the position and the opportunity will be made for you, if it is not already made. The farmer knows when he plants his field of corn that if he goes no farther than the planting, the harvest will be small. Talents must be treated in the same way. The growing plant must not be choked by the weeds of idleness and frivolity, but must be nourished by persistence, endeavor and determination.

STOP! LOOK! LISTEN! See yourself as you really are; then remedy the defects. Sometime, somehow, from somewhere, will come the opportunity that you have long looked for and you will be ready to meet and conquer the task that is set before you.

H. Lynn Staley, South Bend, Ind.

Science Notes

Airship propellers are carved from wood built up in layers.

Scrubbing with strong salt water will prevent matting turning yellow.

An average man breathes about twenty-one cubic feet of air into his lungs every hour.

Full Page Plates Showing Complete Details are Presented on the Two Pages Following
Ornamental Gates and Fences
ORNAMENTAL GATES AND FENCES
Practical Uses of the Steel Square

FRAMING UNEVEN PITCHES

The illustration we present this month is neither a whirligig nor a flying machine, though we must admit it is going some and also getting up pretty high.

We have no doubt some will say that it is too high, while others will say that it is out of sight. It went up by degrees and so it must be all right. It is in reality a continuation of our last month's article; and what we said in connection in that is applicable to this article. Last month the diagram was shown in connection with an equal pitched roof, while in this it is shown with an unequal pitched roof. The balancing point in either case is at O; and in the even pitched roof, the run of the hip is at the half-way point, or 45 degrees from the run of the common rafter. But when one side of the roof is steeper...
Open Timber Work

HOW THE OLD-TIME OPEN TIMBER OR "ENGLISH HALF-TIMBER" WORK WAS DONE—ITS RELATION TO MODERN CEMENT PLASTER WITH PANEL STRIPS

BY C. BRYANT SCHAEFER

OPEN beams characterize the most attractive of our modern cottages. For a long time designers were possessed of a desire to introduce this style of work but the high price of cement made it impractical to do so. Of course, many substitutes were devised, usually small shingles and recessed siding and sometimes brick. But now plaster-cement houses with timber construction in view have become an attractive feature in every village.

It was the picturesque bits in the old country that stirred the desires of the home builders. They should really be called the first skeleton construction; the predecessors of the modern steel framework. Like this form of construction the old fashioned house was built in frame. The openings were then filled with solid clay or plaster. Neither of these materials would stand up without the support of the framing. Where large panels occurred their size had to be reduced by intermediate members to support the staff-like filling. These intermediate supports had no structural importance hence they were put in in various ways, often with more or less haste, as their unequal and unmatched proportions indicate. The result is a picturesque quality hard to equal.

In Fig. 1, showing a bay window with the gable over it, may be seen the old proportions of the minor timbers. In the first story there are solid turned posts supporting the corners. The small lights in the window sash were necessary as glass was only produced in small panes. The dividing bars were arranged ornamentally to overcome the awkwardness of their presence.

Ludlow, England, has many examples of this style of building, dating from Elizabethan days. The build-
ers of the work illustrated in Fig. 2, seem to have worked off all their crooked sticks in the gable and story over the massive entrance. It did not matter much if they did not fit the pannels as long as they helped out the brick.

These early English designs show no classic mouldings or proportions. Where there is carving it is derived from Northern sources; old time Europeans having evolved quite an extended system of ornamentation which represented their business and affairs.

The balcony design (Fig. 3), beneath which was a shop front, is quite decorative. It is all in this Northern style of detail and is done by hand. The faces in the panels seem to have been suggested by the faces that peer out of the windows. The corner post is carved all the way up in pilaster style. The circles show considerable patience. The balcony front is richly carved and perforated. There are many little faces with various expressions of features. One is inclined to believe that all the workmen were remembered!

The French example (Fig. 4), is finished with Gothic carving. The mouldings are cut on the solid. The swan in the door panel, however, is one of the devices with which people identified their business before the art of spelling was introduced.

The general idea in constructing this frame work seems to have been to brace the square form so it would not lean or skew. The slanting brace in the
second story over the entrance is quite independent of any relation with the brick patterns.

The example from Germany is of the tile roof style. It was one of the store houses of the city and each story juts out beyond the lower one to make room for the wares. This kind of work was introduced by the ship carpenters who were naturally in close touch with building needs of this kind.

This facade is elaborately carved. The subjects are all taken from fireside tales with which people used to be familiar. They are from olden times and were considered instructive as well as entertaining. That is how this front came to be so profusely carved. It is the custom nowadays to spread on decoration without regard to its use or sense, which makes it seem foolish labor and in poor taste.

These picturesque houses were all fashioned and put together on the spot. Much of the work was done by rule of thumb. Now it is not strange that the modern workman with all his advantages, his tools and skill in using them, should be going back to these rude old examples for ideas? And securing the ideas is it possible to build as frankly?

Rafter ends may be left open and cut with a scallop. Instead of the huge plaster box posts on porches a solid timber is better because it does not rob the interior of light. It looks more massive in wood than something five times as thick in brick.

Modern Open Timber Work

The usual method of showing open timber now is quite independent of any structural use. Grounds are nailed in place against which to plaster and then thin \( \frac{3}{8} \) inch boards are nailed on top to resemble timbers. One method of construction is covered up and thereby made to resemble another method no longer in use. The inconsistency is, however, seen and at least partial efforts are made to overcome it.

In recent cottage building there is a great deal of real timber work, especially in connection with porches and gables. A good solid lintel supporting rafters or lookoutts may be easily made to show with good effect.
Work of Ornamental Glass Association

It is the contention of the National Ornamental Glass Manufacturers' Association of the United States and Canada that ornamental glass should be restored to its proper place in the decorative arts. This is a strong association made up of manufacturers and craftsmen in the various branches of art glass work, that has for some time been making an active effort to improve conditions in ornamental glass circles and to encourage high class design and workmanship. Mr. H. H. Jacoby, of St. Louis, is President of the Association and Mr. J. E. Flanagan, of Chicago, is Secretary.

In speaking of what the association is working to accomplish Mr. Flanagan recalled the fact that in former times art glass work was of the finest of the fine arts. In the middle ages, in England, France and Germany the craftsmen in art glass wrought with such skill and with so much devotion to their art that we still marvel at the beauty of the masterpieces they produced. The competition of those days was the competition of quality, not of price; and, commercialism with its tendency to beat down the cost at the expense of art, was still unknown.

The members of this association are true lovers of the beautiful and they are using their wide influence to bring art glass back to its proper place among the decorative arts. They ask the assistance of architects and builders in this matter. Since ornamental glass work is really an industrial art rather than merely a mechanical process they maintain that the ornamental glass work on any building should not be handled under the general contract but recommend that it should be specified and let under a separate contract.

Minimum Glazing Details for Art Glass

A recent bulletin issued by the Association shows details of recommended practice for setting art glass and protection glass in wood, stone and metal. These details are reproduced herewith one-half full size. They are minimum details. It is information of this kind that is often needed to insure good work, and important jobs are sometimes disappointing because of lack of attention to those seemingly unimportant matters.

Friends of ornamental glass, those who appreciate its real worth as a material for effective decoration in connection with modern buildings will thoroughly approve of what this association of ornamental glass manufacturers are doing and will assist in the good work wherever possible. We have often heard it remarked that more publicity ought to be given to art glass and the general public educated to a better appreciation of its true worth as a decorative adjunct, not only for churches and public buildings, but also for residence as well.

Slate for Flat Roofs

The main uses of slate at present are for overlapping roofing, suitable for laying only on a sloping roof; and this immediately sets a limit on its use. In many classes of buildings, such as residences, churches, or public structures, sloping roofs are highly desirable, whether for ventilation, increased space under cover, or architectural effect. But in other buildings, such as factories and city structures in general, flat roofs are imperative. The application of slate to flat roofing manifestly opens up great possibilities. This has now been made in what is known as inlaid slate roofing, not by any means an experiment, but a roofing that has been laid on many buildings with a high degree of success.
This is slate sawed at the quarries into three-inch squares, then cemented with a high-melting asphalt to a backing of roofing felt and cut into units, or sections, measuring 12 inches by 15, containing 20 slates. These flexible sheets of small slates are then packed in crates (four crates to the square) all ready to be mopped on to the waterproofing with hot asphalt. It takes 80 units containing 1,600 of these little slates to cover a square of roofing (a space ten feet square). This makes a strong slate roof, that harbors no dirt and is washed clean with every rain, that is virtually an extra floor to the building and can be used for all outdoor purposes for which a roof is adapted. It weighs less than four pounds to the foot, including the waterproofing, and is as well suited to light structures with board roofs as to the heavier concrete or fireproof construction. The slates are made small for three reasons: 1, to obtain flexibility, conforming easily to the uneven surface of the roof deck; 2, to increase the strength of the slate, a three-inch slate having four times the strength of a 6 by 6 slate; 3, to overcome the expansion and contraction troubles.

It is to be understood that the use of the slate does not in any way change the well established method of a built-up waterproofing—single layers of roofing felt with hot pitch mopped in between the sheets. There are no less than eleven different layers in the completed roof: four plies of roofing felt, three layers of pitch in the waterproofing, and two layers of high-melting asphalt, one ply of roofing felt and one layer of slate in the applied units.

One would naturally suppose that the slate trade would extend the keenest welcome to this new method of roofing. It is absolutely removed from any competition with the old methods of slate roofing. Overlapping slate can be applied only to sloping roofs, and inlaid slate is adapted only to flat roofs. Besides this, owing to the small size of the squares, it can be made of slate unsuitable for the manufacture of overlapping slate, and so will tend to reduce the tremendous percentage of waste in slate quarrying.
Furniture for the Sewing Room

A very convenient piece of furniture for the home is the sewing cabinet and table. The design offered is of ample proportions, yet, when the leaf is folded, it takes up little floor space.

It should be made of hard wood, preferably quartersawn white oak, as quartersawn stock is less likely to warp.

The front of the cabinet according to the drawing, due to the fronts being lipped over the facings. If the fronts may be made flush with the facings, the back of the cabinet is paneled in a manner similar to that of the sides.

When the leaf is not needed the bracket underneath is turned and the legs can be folded upward underneath as the leaf drops to a vertical position at the side of the cabinet. The legs which support the leaf are shown square in the working drawing. If the worker has access to a lathe he may turn them as indicated in the photograph.

**Stock Bill for Sewing Cabinet and Table**

*Top of cabinet,* 1 piece, $\frac{3}{4}$ by 23$\frac{1}{2}$ by 24 inches, S-2-S.

*Leaf,* 1 piece, $\frac{3}{4}$ by 23$\frac{1}{2}$ by 25$\frac{1}{2}$ inches, S-2-S.

*Rails,* 2 pieces, $\frac{3}{4}$ by 2$\frac{1}{4}$ by 16$\frac{1}{4}$ inches, S-4-S.

*Rails,* 2 pieces, $\frac{3}{4}$ by 5 by 16$\frac{1}{4}$ inches, S-4-S.

*Panels,* 2 pieces, 5/16 by 15$\frac{1}{4}$ by 13 inches, S-2-S.

*Stiles,* 4 pieces, $\frac{3}{4}$ by 2$\frac{1}{4}$ by 24$\frac{1}{4}$ inches, S-4-S.

*Stiles,* 2 pieces, $\frac{3}{4}$ by 2$\frac{1}{4}$ by 24$\frac{1}{4}$ inches, S-4-S.

*Rails,* 1 piece, $\frac{3}{4}$ by 2$\frac{1}{4}$ by 14$\frac{1}{4}$ inches, S-4-S.

*Back frame and panel—*

*Rails,* 1 piece, $\frac{3}{4}$ by 2$\frac{1}{4}$ by 14$\frac{1}{4}$ inches, S-4-S.

*Panel,* 1 piece, $\frac{3}{4}$ by 13 by 13 inches, S-2-S.

*Brackets,* 1 piece, $\frac{3}{4}$ by 4$\frac{1}{4}$ by 4$\frac{1}{4}$ inches, S-2-S.

*Brackets,* 1 piece, $\frac{3}{4}$ by 4$\frac{1}{4}$ by 3 inches, S-2-S.

*Cleat,* 1 piece, $\frac{3}{4}$ by 1$\frac{1}{4}$ by 22$\frac{1}{2}$ inches, S-4-S.

*Posts,* 2 pieces, 1$\frac{1}{4}$ by 1$\frac{1}{4}$ by 23 inches, S-4-S.

*Rail,* 1 piece, 1$\frac{1}{4}$ by 2$\frac{1}{4}$ by 21$\frac{1}{2}$ inches, S-4-S.

*Rail,* 2 pieces, 1$\frac{3}{4}$ by 2$\frac{1}{4}$ by 18$\frac{1}{4}$ inches, S-4-S.

*Screws,* 1 piece, $\frac{3}{4}$ by $\frac{5}{8}$ by 17 inches, S-4-S.

*Face,* 1 piece, $\frac{3}{4}$ by 2$\frac{1}{4}$ by 17 inches, S-4-S.

*Facing,* 1 piece, 1$\frac{1}{4}$ by 1 by 17 inches, S-4-S.

*Drawer support frames—*

6 pieces, $\frac{3}{4}$ by 2 by 17 inches, S-4-S.

6 pieces, $\frac{3}{4}$ by 2 by 18 inches, S-4-S.

*Drawers—*

*Front,* 1 piece, $\frac{3}{4}$ by 8 by 17 inches, S-4-S.

*Front,* 1 piece, $\frac{3}{4}$ by 6 by 17 inches, S-4-S.

*Front,* 1 piece, $\frac{3}{4}$ by 4 by 17 inches, S-4-S.

*Back,* 1 piece, $\frac{3}{4}$ by 7$\frac{1}{4}$ by 16 inches, S-2-S.

*Back,* 1 piece, $\frac{3}{4}$ by 5$\frac{1}{2}$ by 16 inches, S-2-S.

*Back,* 1 piece, $\frac{3}{4}$ by 3$\frac{1}{4}$ by 16 inches, S-2-S.

*Bottoms,* 3 pieces, $\frac{3}{4}$ by 18 by 17 inches, S-2-S.

*Sides,* 2 pieces, $\frac{3}{4}$ by 8 by 18 inches, S-4-S.

*Sides,* 2 pieces, $\frac{3}{4}$ by 6 by 18 inches, S-4-S.

*Sides,* 2 pieces, $\frac{3}{4}$ by 4 by 18 inches, S-4-S.

Begin work by squaring the top and shelf or leaf to size and put on the moulded edge with a moulding plane. Next work the stiles and rails for the back and two sides to size and shape. After this has been done the frames which support the drawers should be made. Note that the lower frame is to project in front farther than the other frames and make due allowance in framing the stock for it.

Make the necessary facings and then assemble the cabinet. After this the drawers may be made and fitted.

The leaf is to be cleated as shown in the accompanying drawing and the brackets made.

Shape up the two posts or legs which are to support the leaf, as shown, or turn them on the lathe.
The hinges may be attached before the finish is applied, but the escutcheons and pulls should be left off until afterward.

The following directions will produce a suitable finish and one that will withstand wear: Put on a coat of stain of a color desired, English, golden, etc. Upon this, after it has dried thoroughly, put a coat of thin shellac to keep the highlights from being discolored by the stain in the filler which is to follow. The stain should be sanded lightly before the shellac is applied, to lay any roughness. If water stain has been used a second stain should be applied before filling and after sanding the first coat. It should be diluted, however, by the addition of an equal volume of water. Sand the shellac lightly, then apply a paste filler colored to match the stain but darker in tone. Rub this off in the usual manner with excelsior; then polish it with waste or an old cloth. Sand the filler lightly after it has set and on it apply a coat of orange shellac. If the wood finish is light in color white shellac should be used.

On the shellac coat put two or three coats of some good rubbing varnish. Rub each of the first coats with hair cloth and the last with pulverized pumice stone and crude or raw linseed oil.

If desired, the cabinet might be made of maple and finished natural. In this case, maple being close grained, the paste filler should be omitted as well as the stain.

**How to Make Sewing Room Rocker**

A small rocker suitable for a sewing room is shown in the accompanying illustration and working drawing. It should be made of the same wood and given the same finish as the cabinet, providing they are to be companion pieces.

**Stock Bill for Rocker:**
- Front posts, 2 pieces, 1¼ by 1½ by 13 inches, S-4-S.
- Back posts, 1 piece, 1¼ by 5½ by 31 inches, S-2-S.
- Seat rails, 1 piece, 1 by 1¼ by 16½ inches, S-4-S.
- Seat rails, 2 pieces, 1 by 1¼ by 15 inches, S-4-S.
- Rockers, 1 piece, 1½ by 4½ by 24½ inches, S-2-S.
- Cleats for seat frame, 4 pieces 3½ by 1½ by 14½ inches, S-4-S.

From this stock bill it will be seen that the back posts are to be got from one piece of wood, also the rockers. A little forethought will show how the two pieces each are to be got out of the ones specified.

Square up the front posts then shape the back posts. Next, cut the rails to length, making allowance for strong tenons. Those pieces that are specified as S-4-S...
need only to have the mill-marks removed by means of the scraper, or smooth plane and scraper.

Forms will need to be constructed over which to shape the back rails. These forms should have a radius somewhat shorter than is called for by the drawing. The pieces will tend to spring backward slightly when released, and unless allowance is made the curve will not have the correct radius in the finished piece.

A steam box will be needed for this part of the work. If one is not convenient it can easily be improvised. Nail four boards together so as to form an enclosure large enough to take in the pieces to be steamed. In one end put a board with a hole in it through which a pipe or piece of hose can enter. Attach this hose to the tea kettle and, having put in the steamed pieces clamped to their forms, put the kettle on the fire and stuff rags in the other end of the box so that the steam will not escape. After the pieces have been well steamed they can be removed and set out to dry before the clamps are removed.

The seat may be made detachable if desired, or it may be made as indicated in the picture. In either case there should first be a covering of heavy canvass, then webbing, on this a covering of felt, covered with another canvass, and finally the leather.

Adaptability of Oak Flooring

Very often architects and contractors use the Clear Plain (first grade) of oak flooring in many rooms where the Select Plain (second grade) could be utilized equally as well, at a saving of about 25 per cent in the cost. Select Plain (second grade) makes a floor just as serviceable as the Clear Plain and equally as durable. The principal defect in this grade being sap, which in oak is not considered as serious a defect as in other woods, on account of the tannin condition. The difference in the shading is easily lost sight of in the finishing, by application of a golden oak filler to blend the light and darker pieces. Such a finish would make it very difficult for even an expert to distinguish it from the Clear (first grade).

The Select Plain (second grade) will fill every requirement where a medium priced floor is desired, whether it be in apartment houses and such character of buildings, residences, stores, public buildings, club houses and hotels. This class of buildings requires a high class and serviceable floor. Select Plain is highly recommended, as it gives an artistic and durable floor at a very reasonable cost.

Some of the best homes, costing from $7000.00 and up, are now using the Select Plain in the upper floors and very often the entire residence uses this grade throughout.

A little care on the part of the floor layer, with this Select Plain (second grade) will insure a job almost as good as though the Clear (first grade) was used. Bad discolored pieces should be utilized for places under the rugs, closets, and other out of the way places.

The Select Plain oak flooring is manufactured in the 13/16-inch thickness and 3/4-inch thickness. The 3/4-inch thickness Select Plain, without a doubt makes the most economical floor that can be bought. It is tongued, grooved and end-matched. It can be secret nailed and when laid, has the appearance of heavy flooring. The 3/4-inch thickness should always be laid over a subfloor. In old homes it can be laid over the old floors and in new homes over a cheap subfloor. The 13/16-inch thickness makes the most substantial floor but is 30 per cent more expensive than the 3/4-inch thickness. Oak flooring can be had in two colors, white or red. The preference for either, simply resolves itself into a matter of taste, as both have about the same lasting qualities. The white is often preferred, because it runs more uniform in color.
Cozy little cottages and houses still continue to have a strong appeal to the average prospective home builder. We can admire the beauty and grandeur of the fine, large, palatial residences. They are alright for the wealthy and make fine contracts to work on. However, the average man can't enthuse very much over them; they are too far out of reach. It is the little cottage of five or six rooms that is to be built from hard-earned savings, or is a first venture in home-making, that really comes down within the plane of personal interest for most of us.

The little houses illustrated on this and the two pages following were built by readers of the American Carpenter and Builder. All of them are located in the west, the first at Billings, Mont. This is a story and a half cottage, 30 by 40 feet in size; has living room, dining room, kitchen, downstairs bedroom and bath on the first floor, and two nice bedrooms besides a store room and closet space on the second floor. The arrangement of reception room and living room is worthy of special notice. The second cottage is somewhat similar in general appearance, but giving a different arrangement of

Builder O. C. Houchin and His New House at Billings, Mont.
rooms inside. This house was built at Thomas, Okla., and cost $2500. It is 34 feet wide and 38 feet deep; has four rooms on the first floor and three bedrooms with bath on the second floor; that is, counting the large alcove off the hall as a possible bedroom.

In this design the front porch reaches clear across the front, while in the cottage just described half of the porch is walled in and makes the reception room.

The wide extending bungalow cornices are used on both, two different kinds of cornice brackets being used.

Mr. Thomas J. Fowler, Jr., the builder, is an old country workman who understands the art of building almost perfectly, the construction throughout being very substantial. The house is heated with hot air and lighted with acetylene. Water has not yet been piped, but will be soon.

The large living room and the large kitchen are just the same size and are most convenient on a farm where the farmer's wife and daughters do the work. A large entry where the men come in and wash and clean up is so indispensable where the men are out in all weather and in all kinds of work that no farmhouse should be without one.

There is no gingerbread nor fancy millwork on this house to deteriorate or grow out of date.

Up-to-Date Farm House

The third design is described by the owner, who signs herself "a farmer's wife and a builder's daughter," as follows:

This is a photograph of what we are pleased to call an up-to-date farm house. There is neither a reception hall nor parlor, but there is ample room for the family of five, with room also for hired help, or the occasional guest. The house faces the public highway on the south, but the entrance is on the east from the private driveway.

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Sugi Cypress
New Process for Treating Cypress by Which Novel Art Effects Are Secured

Sugi manifestly comes from the Japanese. The Sugi process of treating cypress is an imitation of the driftwood Japanese effect. The process brings out the beautiful grain of cypress in the shape of shimmering fronds, masses of curly fern, the delicate tracery of sea shell, and many other fantastic and fascinating designs.

Cypress, being without pitch, is the only wood that will work satisfactorily under the Sugi process. Cypress combines the characteristics of both a summer and winter wood, and in the Sugi process supreme heat scorches out the summer wood, leaving the winter.

Up to quite recently, a certain shop craftsman at Minneapolis, by name of Bradstreet, had been turning out Sugi Cypress and attaching considerable mystery to the process. Secretary Watson, of the Southern Cypress Manufacturers’ Assn., who is so imbued with cypress that he dreams of the wood, fell to experimenting during off hours; and now Watson has produced precisely the same effect that Bradstreet created.

And it is no secret. The process is at your hand, provided you have cypress with which to work. An ordinary gasolene torch, such as plumbers use, and a stiff wire brush are the only tools required.

The work must be done on the cypress wood before it is put in place, otherwise the supreme heat on one face will cause the wood to slightly warp. However, the wood immediately readjusts itself and entirely straightens out within twenty-four hours, as it will absorb the moisture back from the atmosphere.

The torch flame is passed slowly over the finished surface of the cypress plank. Separate, flat-sawed stuff will be used rather than the edged grain. With the wire brush the surface is stroked gently to remove all particles and dross, and then is applied a very little floor wax. Care must be taken in applying the wax. Do not use it as a filler, but merely to polish off the raised surfaces. Then the plank is finished. No paint, varnish, or oil is required. The wood is ready to be worked up into fine paneling for interior decorating of libraries, dining-rooms and halls.
Use and Care of the Scroll Band-Saw

By Chas. Cloukey

When getting ready to braze a broken band saw, it is a good plan to measure the length of the blade before brazing the ends together, for it is a fact that sometimes a small piece of the saw will be broken off and lost when the saw flies off the wheels, it is rather disappointing to go through the routine of brazing only to find that the saw will not go on the wheels when they are clear together.

After the saw has been put in condition as regards straightness, length and kinks, the next thing is to file the laps for the braze. Some men grind them on the emery wheel and some others have a regular lap-grinder but as intimated before, this article is mostly for those who have to work out their own problems without the aid of filing room machines. Fig. 3 illustrates a narrow block of wood about an inch or so square, which may be put in a vise and the end of the saw to be filed fastened to it temporarily by means of a little thumb clamp.

Fig. 4 gives two views of the lap which in small saws should be about the length of the space of two teeth. When the teeth are more than ½ inch pitch the lap should be less, or in other words, ¾ of an inch lap is plenty long for any blade on a scroll machine. In the lower part of the figure is shown the lap filed and ready for the solder, and the thin ends are not filed clear down to a feather but some little thickness left to dress off after the braze is made.

When the saw to be brazed has a good deal of set it is better to take the set out of the teeth included in the lap as it will be much easier to get a lap that will lie flat and clamp well between the tongs. It is important to have the filed surface of the lap quite level and flat so that the distribution of solder will be even throughout. A small flat file is the best for filing laps as it is easier to carry level than the three cornered tool. In matching teeth for the braze it is just as well to see that the set of the teeth is unbroken in sequence, especially if the saw has been set with a machine, and as shown in Fig. 4, it is best to let the front end of the lap come a little short of the end of the tooth which is thus not divided where the lap is the weakest.

No attempt at brazing should be made without a good clamp to hold the ends of the saw in proper lap, and as these are quite inexpensive it does not pay to try to rig one up at home. The other necessity is some good silver solder. Some men braze with sheet brass but an ounce of sheet solder will braze all the saws in an average mill for a number of years, and one cannot afford to be without it. A little muriatic acid and a little borax will complete the list outside of the tongs and some way to heat them. As nearly every
The jaws should close parallel at about 1/20 of an inch or a little less, so that it will grasp the whole lap and pinch down on it all at once. The jaws should be at least half an inch the other way, and at least 1/2 inches long unless there are wider saws to be brazed, in which case the tongs should be long enough to reach across.

When things are ready, the saw should be placed in the clamps with the back in line and the teeth matching. Sift on a little borax and work it into the lap to act as a flux in fusing the two metals. Cut a piece of solder a little larger than necessary to cover the lap and after dabbing a little acid on each side of it, slip it between the ends of the blade, in the lap. After the lap has been filed to an even thickness and tested by a pair of calipers to make sure, the saw is to be cared for as though it had never been broken.

Now turn your attention to heating the tongs and when they are a bright red, quickly and neatly grasp the lap and hold it until the braze becomes as hot as the tongs themselves. When withdrawing the tongs, care should be taken not to pull the lap loose, and indeed it is a good practice to hold the lap until the tongs begin to cool enough to let the metal harden somewhat.

A good braze is the result of a chemical compound composed of the steel and the silver solder and is as strong as any part of the saw as regards breaking through the braze. Sometimes when the tongs have not been heated sufficiently a lap is soldered instead of being brazed, and may look very nice, but will not stand the strain of work. If the tongs are too hot, a burnt saw will be the result and the injured parts will have to be cut off and another lap filed as before.

If the braze looks good and will stand the test of short bending, it should be taken back to the little block mentioned before and the lap filed down to the same thickness as the balance of the saw. This last is of considerable importance for a thick braze will not only pound the guides and make ridges and hollows in the work, but will sooner or later break the saw. Some sawyers file their laps just enough to brighten them before brazing, and then braze and file to thickness afterwards.

Narrow saws may be brazed by heating the laps with a blow-torch, but those of half an inch and more in width are so hard to heat with the torch that unless one has a furnace built to hold the heat, the percentage of misses is too high. When heating with the torch it is necessary to have a pair of flat jawed pliers, wide enough to cover the lap, and when the saw is heated to the brazing point, grasp it with the pliers and hold it until it cools.

After the lap has been filed to an even thickness and tested by a pair of calipers to make sure, the saw should be put in the filing vise and the teeth at the lap fitted. That is, they should be set and filed to shape, after which the saw is to be cared for as though it had never been broken.

One of the frequent causes of scroll saw disaster is lack of set in the teeth. Setting band saws is one of the chores that few men enjoy doing, and even when the plant has a good machine set it is one of the very particular jobs which no one likes. Some men have a difficulty in making the reciprocating sets do good work on old saws, some of the teeth having much set and others being scarcely bent at all, and are at a loss to know the reason, for all their adjusting and re-adjusting do not help the matter. As this type of set does its work by engaging the side of the points and pushing them so far to each side while the blade is firmly held in a clamp, it naturally follows that the lateral movement right for a long tooth will give less spring to a shorter one, and when a tooth is real short will not bend it at all. Take a saw like the one illustrated in Fig. 5, and it would not be possible to do a satisfactory job of setting with a reciprocating set. In such a case the saw should be put on the wheels and carefully trained to the guides so that the back will run in a true and steady line, and then joint the teeth with a piece of emery wheel until all are even with the shortest. It will now be necessary to file by hand so that all the teeth are brought to points on the jointed line so that when done all the teeth will be of the same length from the back of the saw. Now the saw may be put on the automatic setter and afterwards on the machine filer. It is a fact, however, that with a good machine file, the teeth will stay much evener than when filed by hand.

Fig. 6 shows a blade with an even filing, and the teeth may have more or less slant according to the ideas of the sawyer, or the kind of wood to be sawed, for soft wood will stand a longer tooth than the harder varieties.

Fig. 7 shows the method of changing from a shallow tooth to a deeper one, by a succession of cuts, the first one at the gullet of the tooth and the second taking off the hump and finishing against the point of the tooth. This change may be made with the machine filer or by hand, but in case of the hand filing, each individual tooth will have to have the care and inspection of the filer.

You often see men filing by hand as fast as the machine will go, even quite a bit faster, but unless the saws are already in fine shape and not very dull, the job is bound to be inferior, and a long succession
of such filings will produce a saw like the one shown in Fig. 5, besides not being so efficient as when all the teeth are of the same length.

When one is learning to file by hand he should be careful to acquire the habit of carrying his file at right angles to the plane of the saw, or in other words, level, so that his file cut will be square across the tooth. Another difficult thing to learn is to carry the file with the same slant all the time so as to file clear from the gullet to the point at one stroke of the file, for to make speed in filing by hand, the filer should give but one stroke to each tooth. To aid in sensing the slant for each tooth as he comes to it, the filer can bring his file over the next tooth to be filed as he takes his backward stroke, and touch it just hard enough to let the file lie flat upon the surface to be filed with the forward stroke. This backward touch must be light or the injury to the file will be considerable, and this is not necessary. After one has become expert, this precaution is not necessary if the filer keeps his mind and eyes glued to his work.

If the saws are so dull that they cannot be sharpened by one stroke of the file, they should be gone over the second time before the file is advanced in the clamp as this will save one half the time of changing the saw which is considerable.

Several instances have come under the observation of the writer where mills have been using scroll machines for resaw work of considerable extent, and for this work have been using saws about an inch wide fitted with %4-inch teeth. Now such teeth have little capacity for sawdust and the result was that little cutting was done at the expense of considerable power and a lot of time.

Fig. 8 shows how saws of this kind may be converted into small resaws by grinding out two or three teeth in a place and leaving the remainder about 1 or 1\% inches apart. Two styles of teeth are shown in the converted saw, and as these saws are usually rather thin it is well to make the teeth as shallow as possible and still have a good shape. It is surprising what a difference it makes in the power and capacity of the blade to be altered in this way. I have successfully sawed veneers %4 thick and 20 inches wide with one of these little fellows, and that without a top guide, as the plank was so wide that the top guide and its shank had to be removed in order to allow the piece to approach the saw.

If spring set is used it is a good plan to keep the teeth pretty close in, and a tooth like that shown in Fig. 9 will stand lots of work.

Fig. 10 shows a gummed tooth and a swage set, and it is a good style where one is prepared to use the swage fitting. I think it is safe to say that most of the mills do not use the swage on such small bands, but it is a mistake to think that because one has a small machine it is an useless expense to equip it properly, for it is frequently much more overworked than the larger resaws.

Skyscraper 2,000 Feet High

New York, June 10.—An office building 2,000 feet in height may become a reality here in the near future as the result of possibilities revealed by recent investigations. Such a building would be nearly three times the height of what is now the tallest in the world and twice as high as the Eiffel tower, which is merely of skeleton construction.

With the erection of the 700-foot Metropolitan tower it was thought that the limit had been reached under the present building code. But construction has already begun on an office building rising forty-eight feet higher, and the latest investigation shows that the maximum safe height for such buildings at present is 2,000 feet.

Such a building, to conform with the requirements of safety, would only have to have a base 200 feet square to stand on, and now that this fact has been brought to light there is talk of an office structure of 120 stories. While it, of course, would not rise 2,000 feet above the street level, it would double the height of the greatest skyscraper now existing and serve to demonstrate the value of buildings of heights never before attempted.

While the increasing value of real estate makes height a prime consideration, the problem of transportation in such a building would be a serious one. The only legal height restriction at present is that no structure shall have a weight of more than fifteen tons to the square foot, and a 2000 foot high, 200 foot square building would come within this limit.

There remains then only the solution of the elevator problem to bring to New York a building nearly half a mile in height and capable of housing 40,000 workers.
Design for Public Library
ARCHITECT'S PERSPECTIVE AND FLOOR PLANS OF A CLASSIC ONE STORY LIBRARY BUILDING HAVING LECTURE ROOM IN BASEMENT

Commodious, Well Planned Library Designed by G. W. Ashby, Architect, Chicago
Plans for Large Modern House

COMPLETE SET OF ARCHITECT'S DRAWINGS FROM WHICH THIS WELL ARRANGED EIGHT ROOM STUCCO AND BRICK VENEER HOUSE CAN BE BUILT

A RESIDENCE a bit unusual in design is shown in perspective on this page. It is in the Elizabethan style, a house of striking appearance. The exterior walls are covered with cement plaster stucco; and heavy exposed timbers support the projecting gables. At the entrance front the second story projects out over the doorstep and is held up by heavy wood brackets which rest against brick piers. A veneering of brick is used along the front and along the right side of the house from grade up to sills.

This use of brick work in connection with cement plaster is very pleasing. The brick is of rough texture face, and is dark reddish brown in color. The brick piers give a substantial appearance to the front of the house that has to support the overhanging second story. The exposed timber work and the wood paneling in the gable ends and around the windows should be left unplaned and stained to match the brick in color.

The floor plans show this house to contain eight
fine rooms, besides two large outdoor screened rooms. On the first floor are large living room, dining room, kitchen and screened porch beside large reception hall; downstairs lavatory, pantry, ice-box, vestibule, etc. On the second floor are four bedrooms, two of them being very large, sewing room, sleeping porch and complete for approximately $7,500, using high grade materials throughout.

The complete set of architect's drawings are reproduced herewith to scale from which this house can be put up. Some good ideas and some decided novelties of arrangement and design are embodied in them.

House Conveniences the Women Want
Reference is often made in the press to the number of details in house planning which a woman architect could do better than a man. Among them are the following, which, according to Construction News, are

two bathrooms. There is provided a very generous supply of clothes closets. On the third floor is a good large space for storage, with the possibility of finishing off some nice rooms there if desired. It is estimated that this house can be built and equipped
said to have been suggested by a woman who had been househunting and discerned these objections:

What woman would put in laundry tubs so deep that the luckless worker who is of short or medium stature is in constant danger of pitching forward upon her head, while the tall woman can at least reckon upon a headache or backache as the result of a few hours' work? Or who but a man would make the ledge stand next to the stove, while the closet is as far away from the self-same stove as it is possible to place it—presumably to give the cook some needed exercise in getting up a meal.

Another idea which would suggest itself to the woman architect is the fact that the toilet room—if there is but one—should be separate from the bathroom as a matter of family convenience. There is no good reason, either, for setting a bathtub a few inches above the floor, thus leaving a space underneath which is almost inaccessible and yet must be kept clean for sanitary reasons. Then, too, if the demand were insistent enough, manufacturers might see fit to market a wash-stand so made that a woman's hair would not inevitably catch upon the faucets every time she washes her face. An extra toilet or lavatory for the conven-
BASEMENT AND FOUNDATION PLAN
House shown on page 54.
ience of guests and children—built into the first floor where possible—is another comfort the male architect often overlooks even in homes where extra expense is not spared.

A clever woman assisted in planning houses or apartments would see the advantage of plain mouldings and woodwork; oiled kitchen and bathroom floors and walls. Another feature that might be easily introduced in the kitchen, laundry and bathroom floors is a drain, so that they could be flooded with water these as well as soiled clothes chutes from upper floors, to the laundry, should be installed in every well appointed private house.

Indoor drying rooms for use on snowy or rainy wash days are another convenience that might easily be provided for in the cellar, but are very generally lacking. These are but a few of the things that a woman assistant could keep before the eyes of an architect in the domestic branch of the work. In

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**ATTIC AND ROOF PLAN**

*House Shown on Page 54.*

that would run off through connections with pipes.

In the more luxurious homes dish and clothes washers run by electricity would help materially to render the work less disagreeable and so induce the servant problem to settle itself. Fireless cookers, now used by not a few up-to-date housekeepers, might also be built in. Outdoor racks for garbage cans with openings into the kitchen have at last found their way into a few of the better class apartment houses but buildings that are to be rented it should be made an invariable rule to put in as many permanent features as possible such as towel and soap racks and medicine chests in bathrooms, utensil shelves and hooks in kitchen and pantry etc., as well as curtain hooks and portiere poles, in addition to shades and screens for windows and doors, for where this is not done each succeeding tenant adds his mite to the disfigurement of wall and woodwork.
Making Modern Bricks

"Bricks are manufactured in an almost endless variety of shapes, sizes and color tints, and are composed of clay, sand-lime, concrete and even glass," remarked a brick manufacturer the other day. "Clay is found in different colors and is treated in various ways to produce the many effects as to color and texture now upon the market.

"The skillful mixture of different clays and various methods of burning produce surprising results.

"The dry pressed brick is made from carefully prepared clay pressed with a minimum amount of water.

"The sand mould brick is pressed in mud form into sanded moulds, hence its name.

"The wire cut brick in either smooth or rough surface is what is commonly known as mud brick, a great-
er amount of water being used in its manufacture and where special roughness is desired the lumps are allowed to persist, thus making more resistance to the wire while in the plastic state, producing the extra rough surface.

"Another surface is made by water dropped upon

Rough effects in brick work have a great vogue to-day and the house built of it will have a wealth of

+ Bracket Brace for a Sagging Door

Screen doors sagging on the opening side which causes them to rub on the floor as they are opened and

House shown on page 54.
shut may be repaired in the following manner: On the opposite side from the hinge and in the lower corner of the frame, place a small ornamental bracket which will not mar the appearance of the door and yet make it perfectly rigid. Before placing the bracket drive a small wedge under the door to hold it in the correct position.

**Not His Fault**

"Oratory is a gift, not an acquirement," said the proud politician, as he sat down after an hour's harangue.

"I understand," said the matter-of-fact chairman. "We're not blamin' you. You done the best you could."—Detroit Evening Press.
The Boston Hip

To the Editor: Barre, Vt.

In a recent number of your valuable publication I notice a description of the so called “Boston hip” on shingled roofs to which I take exception.

In New England the “Boston hip” is not shingled over the other courses but into them and is considered the best looking and most durable way to finish a shingled hip.

The rough drawing I enclose may make the matter clear.

In laying the best practice is to stop regular courses when tip of shingles in each course reaches ridge of hip. Then snap lines each side after rest of roof is completed; and these snap lines will serve to guide straight edge used in marking new shingles laid to complete the courses.

W. H. Messer.

He Takes Exception

To the Editor: Donaldsonville, La.

I notice your explanation of the Boston hip in the May number of the AMERICAN CARPENTER AND BUILDER. Pardon me, but it is not correct. To make the real Boston hip the hip shingles have to be put on with the other shingles. The top end of the hip shingle being cut off and fitted against the adjoining shingle. I have been using the method for a good while and find it makes a neater job than the way you explain it.

The AMERICAN CARPENTER & BUILDER has been a school for me.

W. C. Hazlip.

Sore on the “Little Fellows”

To the Editor: Ogden, Utah.

Enclosed find P. O. order for your valuable journal and if you see fit you may publish my letter. I would not have been so slow with my subscription but for the reason that I am thoroughly disgusted with trade conditions. No thinking person can deny that a carpenter is, or ought to be, one of the highest skilled mechanics and whose pay, or earnings, ought to average favorably with that of any other trade or profession, yet he is found to be one of the poorest paid, owing to several conditions, the worst of which is a ruinous and dirty competition brought on partly by himself, partly by the small cheap contractor who often is no mechanic at all, and partly by the dear public who does not know and does not want good work. There are in nearly every issue of the AMERICAN CARPENTER AND BUILDER questions asked by “contractors” and others, involving arithmetic, the rudiments of geometry, construction, etc., some of which a 10 year old child can answer, others which an apprentice in his second or third year could easily solve.

That class of men lower the standard of work, price and wages, and as a result even good mechanics do not earn as much as a good sheepherder, whose wages are $50 or $60 and keep per month. Now are they respected or self-respecting? Just look at the man in one of the recent issues, who with his little boy built fifteen or twenty houses, etc. Does he look as prosperous or self-respecting as he ought to be in proportion to his accomplishments? He is working for the glory of it. How much above his brother the ox is the person intellectually, who works hard all his life and has then at best a little 2x4 cottage and a lot to show for his and his family’s work? Would you not do the trade, the craft and the public a service by refusing to answer such questions as mentioned above, by telling such persons to go learn “the trade” if they wanted to work and wanted to make an honest living by it.

FRANK STUPPECK.

How to Build a Log House

To the Editor: Erastus, Ohio.

In the copy of your paper for July I see an inquiry by J. M. F. how to build a log cabin.

Here in western Ohio where I was born and have always lived we used to have nothing else but log houses to live in. When a boy I helped to raise some of them.

I remember one built on the adjoining farm to my father’s, which I think must have been at least thirty feet wide and fifty feet long. It was the finest log house I ever saw, being three stories and an attic in height and having a veranda extending along one side. The logs were hewed on two sides and many of them had a face on the outside two feet wide. The logs were mostly black walnut, gray and blue ash; and the house was covered with blue ash shingles.

This house was built about the year of 1860 by a German named John Kintz. It stood on the east bank of Toti (pronounced Tot-eye) creek, about six miles northeast of the place where the army led by General Arthur St. Clair was destroyed by the Indians under Tecumseh and Little Turtle.
November 4th, 1791; now known as Fort Recovery, Ohio.

In building these cabins three kind of corners were used. On some small buildings the one called the flat notch was used as shown in No. 1. On many the saddle notch, as shown in No. 2, was used; but on the better class of buildings what was called the dovetail notch was used, as shown in No. 3. In erecting the log is laid on the building; one man each end chips a shallow notch in the ends; if the logs are large each corner man has a helper. The log is then placed on the building where it belongs and blocked up so that the outer side or face stands perpendicular. Each man then takes what they called a scribe, a bit of one inch board about eighteen inches long and 2½ or 3 inches wide, which is used to scribe the log on both inside and outside of the log to make the corners fit and to take the wind out of the log as shown in No. 4.

The log is then turned down flat and they each chop the upper side to the scribe mark. Then they roll the log over and chop the other side.

If one corner gets higher than the other or the crack is wider at one end than the other the man at that corner cuts his notch deeper by using his scribe the wide way while his partner uses his scribe the narrow way. The one great object was to keep the corners level and the cracks even and not too wide.

S. J. Carmack.

**Hip Roof with Uneven Pitches**

To the Editor:

Mindocino, Cal.

I have read with pleasure the steel square article in the May number and I would like to know if a similar diagram can be drawn, or would it be proper, to frame a hip roof as follows:

Building to be 20 by 30 feet, with a ridge 15 feet in length. According to the size of the building the ridge should properly be 10 feet in length and the run of the hip on the plan would be at 45 degrees with the cornice line; but what would the run of the hip be for the same roof with a ridge 15 feet long and could I find the side cut of the jack as shown, by the diagram in the May number? P. Maxwell.

Answer: Yes, the method illustrated applies to equal and unequal pitches alike. The accompanying diagram illustrates the examples in question.

Figure 1 shows the regular, even pitched roof, while figure 2 shows the irregular, or uneven pitched roof. In the former the length of ridge is governed by the difference in the length and width of the building, which in this case is 10 feet, and since the pitch of the roof is the same on either side of the hip, its run naturally must rest at 45 degrees. On the other hand, if the ridge is lengthened or shortened from what it naturally would be with the even pitch, then the pitch on the end and side of the building must be different, and consequently the run of the hip cannot rest at 45 degrees, as shown in the framing of the roof. It is not essential that the exact angle in degrees be known, because that does not necessarily enter into the framing of the roof. The angle is found as follows:

The building being 30 feet long and the ridge 15 feet, there is a difference of 15 feet, which, divided by 2, leaves 7½ feet at each end. Then the run of the hip must be as the diagonal of 7½ and 10.

A. W. Woods.

**A Cryptic Answer**

To the Editor:

Watertown, N. Y.

In the June number of the magazine one correspondent asked which was the proper way to hang a screen door—screen in or out. Also which was the correct way to swing a transom sash—putty side in or out.

I will answer No. 1 by asking him a question. If you had an outside sash door to hang, moulded on one side, which side would you put out? As to No. 2, I will ask him what the putty is put on a sash for? To keep the water in or out?

J. M. Kane.

**To Care for and True an Emery Wheel**

To the Editor:

Buncombe, I11.

Having had some experience with tool grinding I will offer a suggestion in answer to Bro. James S. Robins' query as "How to true up an emery wheel." Knowing how to keep a wheel true is one of the great essentials.

To do this the operator must see that the stand is mounted firmly, so there isn't the least vibration in the floor, bench or frame work on which the stand is mounted.

Secondly: Keep all bearings in proper shape. There must be tight, snug fits around spindle, or your wheel will play and soon become "untrue."

Thirdly: While using wheel the tool being ground must be held firmly to the wheel and not allowed to jump and bounce. This will ruin a wheel the quickest.

Now as to truing the wheel after it has been abused: First see that your boxings or bearings are in perfect condition and that there is no vibration anywhere.

Having done this provide yourself with some old castings that have straight faces. Now speed your wheel, holding one of the castings firmly on the tool rest so as to touch the high place on the wheel. Do not hold casting too long in one place but shift as often as necessary.

By following this process up, touching only the high places, you will soon be able to see your wheel perfectly true. A common grindstone may be made true in the same way.

I must say in conclusion that the American Carpenter and Builder is a great journal.

Chas. F. Mozley.
Unusual Home-Made Clock

To the Editor:  St. Louis, Mo.

This little home-made mission clock, with photographs of the baby arranged around the dial has caused many exclamations of wonder and envy. There are clocks of a thousand different kinds, but real individuality in clocks is so hard to obtain that it seems worth while to go to a little extra trouble. It is very easy to make a mission clock and it is but a step further to add individuality. Here is how this unusual clock was made:

I obtained four pieces of quarter-sawed oak, 1 by 2 inches, two of them 9½ inches long and the other two 5½ inches. The two long pieces were used for the sides and the short ones for the cross pieces; and the four were fastened together with ordinary nails. The cross pieces, as shown in the drawing and photograph, were set one inch up from the bottom and down from the top, producing a square space for the dial, but getting away from the square shape in the clock.

To keep out dust and to have a covering for the photos it was necessary to put a sheet of glass in the front. This was accomplished by cutting a channel into the inner edge of the pieces before they were nailed together, into which the glass fitted on its four edges. The channel was started with the saw, held along a straight piece of wood, and then deepened and widened with sharp cornered glass used like a plane. The channel, one-fourth inch from the edge, runs the full length of the two short pieces and to one and one-half inches from the end of the long pieces.

Oak is very hard and nails are apt to split the pieces, so I drilled one-eighth inch holes for the nails in the side pieces. Three of the pieces, one side and the top and bottom, were fastened together before the glass was put in. A hole having been bored through the center of the glass, to fit the stem of the clock (it is easy to bore through glass if a sharp pointed file is used as a drill and is moistened in a mixture of spirits of camphor and turpentine). The glass is fitted into the groove in the three pieces and the fourth piece nailed into position. It was necessary to be careful about the fit of the glass else it would have broken when the piece was nailed on.

Four small pieces, one-fourth inch square and 5½ inches long were cut and planed for the inner frame in front of the glass. When placed in position as shown in the photograph and drawing, the inner frame cut up the front into five perfect squares and four oblong spaces. Each corner has a square 1½ inches, and the center space for the dial is 2½ inches.

The other spaces could be cut again if desired, making more tiny frames for photos, but I left them 1¼ by 2½ inches, and used four long and four square photos. The slats were fastened with glue.

The dial was made by pinning a piece of thin, strong, white paper over a dial of the right size (2½ inches) in a clock catalogue and tracing the Roman numerals with black ink. The ink should be as black as possible, drawing ink being best. The paper might have been stretched over the original dial, if no catalogue had been available. The paper was trimmed so that the edges would be hidden behind the pieces forming the little frame, and the edges around the dial were blackened to make the white stand out in relief.

Eight kodak views of the baby in different poses and representing different ages, were trimmed to fit the eight spaces around the dial. One edge was pushed into the groove behind the glass and the other edges of each print were hidden behind the frame pieces. A drop of glue on the back of each print and of the dial held all firmly to a thin sheet of paper laid over them after they were put into position. To hold the paper flat and prevent wrinkles in the photos, a heavy piece of cardboard, with the center cut out so as not to thicken the space between the clock and the glass (the stem would not go through the cardboard and glass both) was placed in the frame.

This completed the frame for the clock. A small eight-day bureau, or desk clock, with a 2-inch dial was chosen as the timepiece. It was taken out of the case and the dial and its supports removed to lengthen the hand post. Then the case was cut off at the front with a file so that the works would come against the back of the paper dial. This allowed the stem, or hand post, to extend through the hole in the glass and project about one-eighth of an inch beyond, plenty of room for the hands.

The clock was fastened in position by cutting a "V" shaped notch into two 1 by 2 by 5½ inch pieces, to fit the case. The blocks were dropped into the back of the frame, and tightened against the case of the clock by driving a few little wedges between the blocks and the outer frame. Care had to be taken not to get the blocks too tight, for the case would then have been crushed and the clock bound so it could not run.

The wood frame and cross pieces were stained a bog, or mission oak. The photograph shows what the finished clock looks like. The minute hand was moving while the photo was being taken and does not show well.

Charles Claude Casey.
A Tower Problem

To the Editor: Taylorsville, Cal.

Enclosed you will find a blue print of a frame tower which has more complicated cuts than would appear at a casual glance.

My partner and I have completed a line of twenty-three of these towers and in that time did not get a proper solution of the cut for the top ends of the braces, that is the joint where the two braces come together. Now, if Mr. Woods would kindly give us a steel square solution, we will be much obliged, as we are both interested in the work and in your magazine, which we always read and try to get all the good out of we can.

J. L. Prerce.

Answer: In order to make a good job in building tapering towers, the corner posts should be backed so that when they are in position the faces of same will be in plane and the cross bracing will fit snugly up to the sides.

Fig 1 shows how the backing may be arrived at by laying off to scale the pitch that the post would have and which is in identically the same position as a hip in a square cornered roof; but instead of the center of the back of the hip intersecting the corner of the base, the post is turned so that one of its corners must intersect the corner of the base. This requires the post to be dressed off so that the foot of the post will coincide with the square corner of the base.

Lay off the diagram, as shown, letting A-B represent the run of the tower, B-C its rise and A-C its pitch, A-D the run of the corner post or brace, and this transferred to the extended line A-B will represent its corresponding run and D-C will be its pitch. On this line, lay off the full size post, as shown, and where its lines intersect the run line will represent the seat cut taken diagonally through the post.

Fig. 2 shows the top and side view of the tower peak.

A. W. Woods.
Two Suggestions

To the Editor: Pleasant Green, Mo.

Being a subscriber and reader of the AMERICAN CARPENTER AND BUILDER from the beginning of its infancy (except the second year), if you consider these lines fit for publication, many thanks to you; if not, all well and good.

I wish to write concerning two important questions. BETTER WORKMANSHIP AND IMPROVEMENTS ON THE STEEL SQUARE. I have been a carpenter and builder for nearly eight years. After having worked in three states, traveled in a dozen others and being a close observer and somewhat a crank, I notice especially in the cities on the cornice and outside baseboards, the butt joint seems to prevail. I, for one, consider the mitre joint the best, because it can be drawn together from both sides and paint looks better on side of lumber than on end; besides the sun does not draw it off as easily. The Scripture says, “He who buildeth a house is greater than the house.” I do not wish to add to the Scripture, for in another place it says “Thou shalt not add to or take from.” But I wish to add to what I say by saying, he who doeth neat work is still greater than he who doeth not good work. I consider neat workmanship on a building a good monument to the builder’s memory. Will say further that all builders can have monuments somewhere on the Almighty’s foot stool.

In regard to the steel square, I believe there is one important graduation that should and could be there; the degree or tangent rule is one of the most important rules we have to confront at this day and age of the world. We have our degree protractors, mitre squares, bevel squares and universal squares, and last but not least a “Key to the Steel Square,” all of which are useful and difficult to be without. If we know how to use the steel square, it is all there ready for us. If a mechanic’s memory could contain all the tangents and rafter diagonals he would be too smart to work at the carpenter trade.

I would like to see graduated on the steel square the tangent rule, say for instance, 22½ degrees is the octagon degree, 12—4 15-16 giving the proper angle, somewhere on the square at 4 15-16 let there be engraved 22½ degrees and continue likewise with the rest of the tangents. I think this rule and the rafter or framing rule would make a more complete square. I am willing to admit there would be a great many carpenters buy one of these squares who would not know how to use it, but this kind usually do not make good framers anyway.

I am sorry I did not begin working at my trade earlier in life—like a great many other things I did not begin earlier. I was 24 years old when I began work at my chosen profession and was foreman at 26. Of course I did not know as much then as I do now and do not know any too much yet, but my ambition is to obtain a vast amount of knowledge and I am sincere when I say more learning could be obtained by placing the tangent rule on the steel square.

WALTER C. WEST.

Answer: In reference to placing the degree angles on the steel square while it would be a good thing for some mechanics, to the great majority it would be of little use and the extra markings on the square would to them be a source of annoyance, as they would not know how to use them and would otherwise complicate other markings for measurement purposes.

However, it is not a new idea, as the patent office records show that dozens of patents on the square have been taken out covering all kinds of markings—some being practical, while others were not and even containing errors. Very few of the squares have found their way to any considerable extent in the hands of the building public.

It is not an easy matter to place even a good thing on the market without a large outlay of time and money, and even then it is nothing very sure of success in the end. Then again, it must be remembered that the markings could not be placed on the square beyond the degree markings with absolute correctness, as each degree is divided into sixty parts, called minutes, and these again into sixty parts called seconds. So that for accuracy from an engineering standpoint such an instrument would not be considered; and to the average man it would require a vast amount of schooling in the way of instructions which necessarily would have to be in pamphlet form, and this is too apt to be not at hand when most needed. The engineer has his handbooks close at hand from which he bases his calculations from standard tables long since established for their correctness, and it is an easy matter for him to apply his calculations to the standard measurements as given on the common steel square. A. W. Woods.

Lilliputian Building

To the Editor: Chicago, Ill.

I probably wouldn’t qualify as a carpenter and builder in the ordinary sense of the term, but as a carpenter craftsman “in the little” I think you would give me a place. The picture shows one of my creations; house and grounds with barn and garage, all built according to approved carpentry construction, using exactly the same materials that would be needed for a regular sized house of the same kind and all parts being fastened together in the regular way. Tiny nails were used, no glue nor paste.

I am a brakeman on the Rock Island Railroad, most of my runs being at night, and have employed my spare time in de-

Miniature Homestead Built by Mr. A. R. Deisher

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signing and making these small buildings. This group was part of the Rock Island exhibit at the National Land Show at the Coliseum, Chicago last year. A gentleman there asked me what I would take for the house and I told him that figuring up the number of hours it had taken me to make it and charging regular carpenter’s wages the price would be about $500; but, nevertheless, I didn’t care to part with it.

The sizes of these buildings are as follows: The house is 15 inches wide, 30 inches long and 31 inches high from top of chimney to sidewalk. It is covered with 1,200 shingles, has 21 windows, 18 of them being in working order; that is sliding up and down as ordinary windows. The yard is 28 inches wide and 47 inches long, and is terraced up 5 inches high. The blocks forming the terrace are regular cement blocks laid up in cement mortar. The barn is 22 inches long, 16 inches wide and 23 inches high, with 573 shingles on its roof. The garage is 10 inches square, 12 inches high and has 279 shingles on its roof. The entire weight of the house is 75 pounds and the combined weight of the barn and garage is 77 pounds. The house is furnished complete and is completely equipped, there being even a miniature electric push-button bell on the
front door. The interior of the house is furnished with mission furniture, piano, chairs, tables, etc. A midget woman might sit in the little rocker behind the curtains and look out of the windows unseen by her neighbors.

The tools used in the construction of these little buildings were hammer and saw, plane and jack-knife.

I am now at work on a miniature model of the La Salle street station, Chicago. This is going to be a pretty big job; I expect it will take me over a year to make just the windows, as there are about 1,800 of them.

A. R. Deisher.

Mission Reclining Chair

To the Editor: Harrisburg, Pa.

Figs. 1 and 2 show front and side elevation of chair.

Figs. 3 and 4 show detail of spring frame for seat.

Figs. 5, 6 and 7 show detail of chair.

Fig. 8 gives bill of material.

The particular features of this chair are embodied in the pleasing proportions, the simple lines, the adjusting brackets and the simplicity of construction. The legs are 22 inches apart in each direction, which gives ample room between the handles, and simplifies the work on the end and side rails, as shown in Fig. 5 and rail marked "C" just below the figure. The adjusting brackets F in Fig. 5 are so designed that they occupy the minimum space and permit the cross bar, supporting the back, to be the same distance from the hinges in its different positions. The pocket in the brackets F, Fig. 5 are easily layed out by directions given below. Mark the upper edge "Top" and the left hand edge "Side." Measure 4½ inches down from top and 1½ inches from side; this locates the center of first pocket.

Measure 6 inches down from top and 3½ inches from side; this locates the center of second pocket. Measure 8½ inches down from top and 4½ inches from side; this locates third pocket. Measure 10½ inches down from top and 5½ inches from side; this locates fourth pocket.

At each of these intersections, or centers, scribe a ¾ inch diameter circle, at the top of each circle draw a line square with the side; this will be the top of the projection for keeping the adjusting rod in place.

Then by drawing free hand lines connecting the ¾ inch diameter circles, as indicated in the drawings and truing these by means of the compass, the shape of the opening in the brackets is very easily secured.

A templet made of drawing paper or cardboard of the above will assist materially in marking both sides of each bracket for cutting the openings and shaping the outside of the bracket.

The spring frame should be made separate in order to properly fasten the springs in place by twines, as indicated by
Historic Log House

To the Editor: Mountain Home, Ark.

If J. M. T. of Milwaukee, will send me details and particulars in regard to the log cabin he expects to build, kind information I can. I am not a master in the art of building log cabins but have "officiated" at the construction of several, both good, bad and indifferent.

Have just finished one for myself which in the evolution of things is expected to become the kitchen. It is a summer bedroom now.

There is now standing in this (Baxter) county a log house that was erected in 1810 and is now 101 years old. If J. M. T. of Milwaukee, will send me details and particulars in regard to the log cabin he expects to build, kind information I can. I am not a master in the art of building log cabins but have "officiated" at the construction of several, both good, bad and indifferent.

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There is now standing in this (Baxter) county a log house that was erected in 1810 and is now 101 years old. It stands on a slight eminence near White river and just below the mouth of North Fork, and is known as the old Wolf mansion. It was what was known as a double log house, having an open hallway between the two log pens. It is two stories high and has kitchen and dining room in the rear.

It is built of hewn pine logs, the cracks were "chinked" with blocks of wood and then "pinted" with lime mortar. The lime was obtained by piling limestone on a log heap and burning it. One log in the west end, up near the top, shows signs of decay. The rest are as sound as when the building was raised in Territorial days before Arkansas was admitted as a State.

Several terms of Circuit Court were held here in the old house, as it occupied a point of vantage on White river. The river traffic began directly after the war of 1812; and both before and after the civil war assumed comparatively large proportions.

The place escaped devastation during the civil war; and is still occupied as a residence. It has had no additions and no repairs except new shingles and floors. The walls have never been protected by paint, whitewash or anything; every log is exposed to the weather.

There is a large stone chimney at each end and the huge fireplaces filled with roaring pine knots have warmed the shins of many prominent and notable men.

Ten years ago when the railroad was built up White river the track was laid about 150 feet from the house and the depot was located about 300 feet down the track. The thriving village of Norfolk sprang up; and neat cottages and fancy bungalows now surround the old mansion. The present occupant and owner who was born in the house 68 years ago is now the village blacksmith, strong and active in spite of his three score and nearly ten and as well preserved as any log in his old house.

CHARLES CHRISTIAN.

Puts Screen Inside

To the Editor: Redding, Iowa.

I want to answer the question, Which is the right way, that appeared in your June issue. The Editor says, "Put the screen and the putty outside." I used to say so, too, but now I put the screen inside. It is much better on account of getting flies out. When the door is opened, the flies are easily scared from the screen, with no stiles in the way to hold them. As to the transoms I, too, would hang them with the putty outside.

J. M. Baird.
Stencil Decorations for Awnings

There is a growing demand this year, especially for country and suburban homes, for awnings having an applique or stencil form of decoration, the colors most in demand for the design being green, blue, red, brown and maroon, on white, says Popular Mechanics. The underside of these awnings are being painted to render them opaque, but considerable difficulty is being encountered in coloring the under side with a fast color, and at the same time preserving the outside whiteness and the pliability of the duck.

A Self-Illuminating Pencil

We read in the Illustrated London News that a self-illuminating pencil for writing in the dark has just been gotten out. This appears to be a combination pencil with an electric flash light, and is described as a great boon to dramatic critics writing at a play, doctors making out prescriptions in dark sick rooms, reports at nocturnal functions and all others who find occasion to write where no light is available.

We show herewith an illustration of the pencil.

Wood Preservation in Ancient Times

The constantly recurring question of paving material brings to mind a bit of "ancient history" with reference to creosoted wood blocks. Ancient writers make what may be considered frequent allusions to efforts made for the conservation of wood. It is a familiar fact that tar and pitch have always been used as external applications for the purpose of such conservation. They are, in fact, mentioned in Holy Writ in connection with the ark of Noah, and that of Moses. Both Greek and Roman authorities cite the astringent properties of olive oil also, as well as the oil extracted from wood blocks. Ancient writers make what may be considered frequent allusions to efforts made for the conservation of thought not only to arrest decay in wood but also to protect it from the attacks of insects.

When Phidias had completed his magnificent and enormous statue of Zeus, which stood in the grove of Olympia, it was found that the wooden pedestal upon which it stood was constantly exposed to the damp incident upon its situation. The artist probably feared that this dampness might also attack the inner core of the statue, which was wood, and therefore applied oil in large quantities, realizing that through soaking of this kind it would by capillary attraction ascend into the wooden core of the statue, overlaid with ivory.

Pliny says that the famous statue of Diana of Ephesus, which was wood, was thoroughly oil-soaked through special orifices bored into the wood in many places. And in olden days, it was well known that wood well soaked with oil of cedar would resist the wood worm and decay.

There was no advance upon this method until the English fleet was called upon frequently during the sixteenth and seventeenth centuries to meet various pugnacious adversaries. Self-preservation compelled the British authorities to try experiments against the dry rot in the timberwork of their vessels, and these experiments included applications of resinous vapors, salts of copper, zinc, iron and other metals and metalloids.

But no real progress was made until the railroad came. Then the wooden sleeper immediately came into prominence. It had not only to resist decay, but also wear and tear. It was not only used as a base for a quiet statue, or in the structure of a man-of-war, where no heavy strain came on it except in bad weather, but it had to stand the constant heavy pounding of trains. Solid sleepers, of cement, stone or other dense material, were tried as substitutes, but failed. Then those interested naturally turned to the efforts of preservation of wood, and thus far creosote treatment, i.e., the return to most ancient methods, seems to have proven most satisfactory.
Galloway Quality

Almost anyone can make a gasoline engine even with mediocre equipment, but it takes brains to make a good gasoline engine.

A good gasoline engine must be simply constructed and in buying, simplicity should be one of the first requirements. We are not all engineers with technical knowledge so the simpler the mechanism the better. "Galloway engines" are simplicity itself; after being once started—a very simple operation—they need no further attention. It took brains to evolve an engine of this type.

The Wm. Galloway Co. take an especial pride in the "Galloway Engine"—A Dependable Power Plant

"Galloway Engine" and the pride is justifiable indeed; for the engine is a good engine.

The Galloway engine is more than satisfying 4000 users in the State of Iowa alone. This is sufficient recommendation alone as to its reliability and dependability.

On this page is a cut of the Wm. Galloway plant at Waterloo, Iowa,—an institution it may well be called; for, besides the huge factory buildings made entirely of concrete, the administration building, where the offices of the Company are located, is a huge, monolithic cement structure, which houses an immense sales and office force.

This building is the result of the great growth of a business that started only a very few years ago. The first Galloway plant was nothing more than one small room, while now it covers acre after acre.

This growth is the natural result of gratified customers plus the indomitable pluck and energy of Wm. Galloway himself.

It is not the purpose of this article to go into detail regarding the Galloway engine. Their literature does that far better. Write them to-day. Their proposition is interesting whether you want to buy a small or a large engine. They manufacture a large variety and can give you just what you are looking for.

Remember in buying an engine that has the name "Galloway" on it, that "Galloway" is a "buy word" for satisfaction.

Free Sample Offered

Welt & Sons Paper Company of Detroit are offering to send a free sample of their Amafibre Building Paper to every contractor and builder who will write for it. Amafibre is really a very superior building paper.

As the name implies it is a fibre paper very strong and tough. It is also very light; and these two qualities, lightness and toughness make it easy to handle, hence recommend it to the man who has the actual work of putting it on to do.

Amafibre is water proof, wind proof and largely sound proof. It is very durable and once in place stays as long as the house lasts.

It is a sulphite paper, for use in any place where building paper is usually applied—and enjoys even a wider range of usefulness than ordinary building papers, owing to its toughness and weather proof qualities.

Contractors, builders and others who are interested are invited to write to the makers for a sample showing quality and texture.

New Willis Catalogue

The Willis Manufacturing Company, Galesburg, Ill., have just issued their new catalogue No. 6, celebrating their twentieth anniversary. This is a book of 180 pages, showing completely their stock of architectural sheet metal work and affiliated lines. All features are nicely illustrated and full description and prices are given, making this a very valuable book for reference, as well as for ordering materials. The book is substantially bound and is fully indexed.

The Willis Manufacturing Company desires to place a copy of this catalogue in the hands of every reader of the AMERICAN CARPENTER AND BUILDER interested in these lines. Will you write at once for your copy?
Build Artistic Stairways
From Gordon-Van Tine Stock!
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Through our ceaseless efforts of selling reliable stairwork at cost plus one small profit, we have been able to produce and sell stairwork at prices which leave a handsome profit for the contractor. In our Grand Free Millwork Catalog, we itemize individually, each and every article required for the stairs, and explain fully just how this material comes to you and attach net prices. With this information at your command, an infinite variety of arrangements of stairs can be figured within a few moments, and you know the exact cost without entrusting your interest to any outsider.

The fact that part of this material is already machined ready to go right into the stairs, reduces the erecting cost very materially. We use only thoroughly kiln-dried material in making up the different parts of this stair stock, and only the most skilled and expert mechanics are employed in the production of the finished article. By using kiln-dried lumber you avoid any of the annoying effects all shrinkage or coming apart of the stairs after they are put in the building. The itemized list for a flight of stairs which is given on this page, shows you at a glance how reasonable the material for a complete stairs can be purchased.

The fact that you have had no previous experience in the stair building line should not deter you one moment from learning its simplicity now. If there are any points which are not practically clear to you regarding the proposed stair for which you are in the market, write us, and we will give you the advice of an expert stairbuilder.

Vast Assortment of Oak and Yellow Pine Stair Material

Our stock designs of Stair Newels, Rails, Balusters, Steps, Risers, Face and Wall Stringers and miscellaneous materials in Oak and Yellow Pine is very complete. A line which is at once adapted to the swell and modest cottage or most elaborate home.

Correct in Every Detail

We call particular attention to the style of construction, for instance, of our posts; the correct size of all moldings, in order that the assembled effect may be harmonious and complete. Likewise, the turning of the balusters and shape of rails are especially adaptable for these specific purposes.

With the styles illustrated, an infinite variety of arrangements of stairs is permissible, and it is a very rare exception when special work will be required for any particular purpose. Our designs are modern and up-to-date. All Newels are hand smoothed and made from thoroughly kiln-dried stock. All carvings are handmade and not composition ornaments. Every Newel from one-inch lumber, with glued lock joint. Height of all starting Newels 4 feet, with 8 x 8 base and 6 x 6 shaft, suitable for open or closed stringboards. Base of post, 20 inches long, allowing one or two risers. Every Newel wrapped in paper and carefully packed. The stock is all thoroughly machined, well kiln-dried and can be shipped promptly.

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The contractors making the most money today are those who are cutting out the little expenses on their jobs.

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- Rip Saw
- Dado Machine
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- Cut-off Saw
- Rabitting Machine
- Gaining Machine
- Mitre Saw
- Jointer
- Grooving Machine
- Matcher
- Moulder

They're all in the "American" Bench, with self-contained power, either gasoline or electric motor—ready at a moment's notice, always on the job.

Figure for yourself how much you could save on one contract by using "American" methods instead of hand labor.

**AMERICAN SAW MILL MACHINERY CO.**

82 Main Street 1655 Hudson Terminal
HACKETTSTOWN, NEW YORK CITY
NEW JERSEY NEW YORK

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**A Correction Touching Saw Handles**

E. C. Atkins & Co., Inc., used their advertising space on our inside front cover last month to call attention to two Atkins "Silver Steel" saws—one with the regular style handle and the other with their new "Perfection" handle. Through a mistake the two illustrations used were transposed, so that the new "Perfection" handle was labeled "Old Style Handle" and vice versa.

The principle on which this new saw handle works is well shown by the accompanying illustrations. Figure 1 shows Atkins No. 53 "Silver Steel" saw equipped with Atkins genuine "Perfection" handle and illustrates plainly why this type of handle is easiest on the saw arm. While it may feel strange to the beginner—a few days use will demonstrate that the Perfection handle is the most scientifically constructed and much easier on the saw arm than any other style.

Note the line running through the saw arm position straight through the blade to the cutting edge. See how every ounce of power is directed to the point of contact. Observe the wrist and saw arm, how easy and natural the blade drops into its work without pressure.

![Fig. 1. New Style Handle, Showing Direct Application of Effort to Cutting Edge and Natural Position of Wrist While Using](image)

The handle is so constructed that the wrist and saw arm are permitted to operate on a free and easy line and it is plain that through the use of this handle each ounce of power is brought into full play, making the operation not only more rapid, but much easier than heretofore.

Do not gain the impression, however, that all Atkins saws are made with the Perfection handle. Their regular line of "Silver Steel" saws are also equipped with the old straight-across handle that you may have been using heretofore. Note in Figure 2 the line from the saw arm in this case and see that the pressure back of the saw arm is not directed on the cutting teeth, but rather to the back of the saw. Notice this wrist and see how it is necessary to push downward in order to secure proper contact. But even with this old style handle the No. 51 is claimed to be superior to any other, because the blade is made of genuine "Silver Steel" and is taper ground, which enables it to run free and easy, even in wet lumber with but little set.

All of our readers interested in "Silver Steel" saws should write E. C. Atkins Co., Inc., Indianapolis, Ind.
Put It At Work
In Your Shop

The "Multimotor" Shop Engine increases your profits and keeps down the size of your pay-roll. Does the work of three men at an expense of less than a cent an hour.

Stop pedal-pushing and crank-turning! Let the Fuller & Johnson "Multimotor" Shop Engine turn the wheels in your shop. This wonderful engine is small in size but a giant in power. Runs all hand-power or foot-power machines—jig saws, lathes, emery wheel, grindstone, drills, etc.

Just the thing for carpenters, contractors and owners of small workshops.

Perfectly Simple
Absolutely Safe

Simplest, neatest, strongest, most reliable little engine ever built. Comes to you complete—nothing to add but gasoline.

Easily moved anywhere. For indoor use has outdoor fuel tank, insuring perfect safety.

Important working parts protected by dust-proof case. Other patents on important working parts protected by dust-proof cases.

Needs no attention while running. Works steadily all day on a few cents' worth of grocery-store gasoline. It is air-cooled, fool-proof, cannot freeze or overheat.

The "Multimotor" in design, material and construction equals the best automobile engines. Every engine is thoroughly tested before leaving the factory, and is guaranteed!

Fuller & Johnson
Farm Pump Engine

Practically the same as "Multimotor" with pumping gears added. Can be hooked up to any pump in 15 minutes. Needs no belts, arms, jacks or special platform. Pumps 400 to 1,500 gallons every hour. Perfectly adapted to farm and suburban use.

Engine Book Sent Free!

Book, giving full information about "Multimotor" and Farm Pump Engine, sent FREE on request. Let us tell you more about these amazing little power-producers. Let us send you the name of the nearest dealer, who will show you the engine and explain what it can do.

If interested in larger engines, ask for Catalog of Fuller & Johnson's Famous Double-Efficiency Engines.

FULLER & JOHNSON MFG. CO. (Established 1840) Madison, Wis., U. S. A.

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
The modern seven-room home shown at the right was built complete at New Rochelle, N. Y., "Forty-five minutes from Broadway," at a total cost of $3,960.00; an interesting example of the high-class houses designed and planned by Sears, Roebuck and Co.

A glimpse of the artistic and handsomely finished interior is given below. The same firm furnished all lumber, lath, cedar shingles, millwork, beam ceiling, clear cypress siding, oak and maple flooring, finishing lumber, Craftsman doors and buffet, leaded glass, glazed windows, medicine case, building paper, pipe, gutter, sash weights, hardware and painting material for $1,653.00.

A charming bungalow, just completed at Greeley, Colo., in the Rocky Mountain country, at a total cost of $2,843.91. The builder, J. P. Berck, estimates that he saved $500.00 by buying all his materials from one firm at wholesale prices.

A view of the living and dining rooms of the attractive and practical bungalow is presented above. The complete bill of highest quality materials for this bungalow as shown, excepting only the brick, plaster and cement, was purchased from Sears, Roebuck and Co. at a cost of $1,292.00, a complete set of building plans and specifications, for which the average architect would charge $150.00 or more, being supplied without cost.

Reproduced from The Book of Modern Homes, to which the reader is referred for floor plans and detailed descriptions of these and one hundred other residences of the newest designs.
Let Us Ship YOU a Modern Home Complete

Mill Work
Modern Art in Home Designing Demands Constantly Higher Standards in Mill Work Manufacture.
In selecting from our own enormous lumber yard the materials from which our mill work is manufactured, we exercise the same care and discrimination as is employed by makers of the most expensive furniture.
The sample prices quoted below are for the best quality goods that can be produced. They afford only a suggestion of the big savings you can accomplish by ordering your mill work and building materials direct from us.

<table>
<thead>
<tr>
<th>Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>Yellow Pine Doors, 6-panel $9.95 up</td>
<td></td>
</tr>
<tr>
<td>White Pine Doors, 1.40 up</td>
<td></td>
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<tr>
<td>24x36-inch Check Rail Win-dows</td>
<td>$1.00 ea.</td>
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<tr>
<td>Wooden Frames</td>
<td>1.00 up</td>
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<tr>
<td>Door Stop</td>
<td>25¢ up</td>
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<tr>
<td>Quarter Round Molding</td>
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<tr>
<td>Per 100 Feet</td>
<td>23¢</td>
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</table>

Remember that the big saving we effect for you by selling lumber, mill work and supplies direct from our factories at one price, constitutes only half the advantages our plan affords you. Consider the time and the disappointments you can avoid by ordering from your Sears, Roebuck & Co. catalog. You need not build a factory or establish a wholesale lumber yard to realize on the exposed side of the savings we effect for you by selling lumber, mill work and building materials direct from factories at one price. Your competitors cannot estimate its cost by guess. By this plan you can also know in advance just what your profits will be when the job is finished, and can thus speed your profit as the work progresses.

Mill Work

Seroco Ready Mixed House Paint
Made in our own modern paint factory, the perfect product of twelve years’ practical experience. We buy our own raw materials - chemically composed of the highest grade ingredients; sold to dealers, who may not be at home to receive your messages, about delayed shipments of material, or postponed orders, that you are only too careless to buy right when ordering materials and supplies.

PASTE THIS UP ON YOUR DESK

OUR GUARANTEE:
Your money, including any freight charges you may have paid, will be cheerfully returned if you are not perfectly satisfied.

DID YOU READ OUR BIG AD LAST MONTH?

Lumber

Lumber

Our Paint and Varnish Catalog quotes our Peerless Wall Board as being the best in quality and durability of enamel and nickel.

Peelfree Wall Board is: in smooth finish, dump proof and sound proof – better than any other plaster board we have made. Will not crack or warp. Can be painted, varnished, or frescoed, or papered, and can be applied by an unskilled workman in a single job. Made from finest timber lands in America, a

Send us your request for our catalog, indicating the quantity. F j i p a tions. Will not crack or warp. Can be tinted to every shade you may desire, and can be made in smaller quantities at proportionately low prices.

Sears, Roebuck and Co., Chicago, Ill.

Gentlemen—As per offer in American Carpenter and Builder and printed matter opposite which I have placed a check mark.

Whole Sale Prices

Sears, Roebuck and Co., Chicago, Ill.

DID YOU READ OUR BIG AD LAST MONTH?

WE PREPAY POSTAGE.
Glidden's Endurance Wood Stains

Mr. Glidden tells the story of "Glidden's Endurance Wood Stains" as follows:

"He loafed in one day in search of a job."

"We looked up his references and one thing and another and told him to go to work. He did."

"It doesn't matter much what we agreed to pay him—everything was satisfactory to all parties concerned, and, as we said before, he went to work."

"He was very quiet and unobtrusive, as you might say, but he started making stains and experimenting with them on various kinds of wood."

"He called our attention to the results."

"It seems he had been working at that sort of thing for twenty years of his dogged, energetic existence. And he had just perfected a set of formulas for wood stains that, in the vernacular of the caboose, baggage car and other select circles, had it all over any other wood stains, and then some."

"We looked at them coldly, dispassionately, for awhile, then we had to admit just what we thought of them."

"He showed us what he could do with them on all sorts of woods and how easy they were to apply, so easy that it would be hard to apply them any way but the right way."

"He showed us how superior they were to oil stains and how superior they were to spirit stains. He didn't leave us any room to argue about it, he demonstrated each step as he talked."

"He proved to us that they do not raise the grain of wood, and he showed us their remarkable covering capacity. All the time we were looking for a chance to pick flaws but we couldn't find any. He showed us that these stains would not injure the finest varnish and he proved their excellent brushing qualities, their uniformity and permanence."

"We have named them Glidden's Endurance Wood Stains and have placed them on the market under that name."

"They actually started to sell themselves from the very start, before we ever had a chance to write any advertising about them."

"That sort of thing doesn't happen every day, but, after all, it was not to be wondered at in this case, just a sight of a small sample of Glidden's Endurance Wood Stains is enough to make one anxious—anxious to see the beauty of wood revealed and intensified under one's brush. The Light Golden Oak is suggestive of the woodland itself, and the Dark Golden Oak of old Baronial Halls. The Weathered Oak suggests the dignity of banquet rooms, and the Kress Green, Fumed Oak and Silver Grey, the bright yet aristocratic beauty of Colonial days, those stately days of buckled shoes and courtly minuets, and so down the list of all the fourteen different stains, Cathedral Oak, Early English, Light Mahogany, and Dark Mahogany, each has a rich and unusual beauty of its own."

"They are designed to be used on new wood which has never been finished, though in cases where it is desired to re-finish wood that has been finished, it is only necessary to remove the old finish with Glidden's Paint and Varnish Remover and then apply the stain."

If you are interested drop The Glidden Varnish Co., Cleveland, U. S. A., a postal and they will gladly send you a color card with samples of wood stained with Glidden's Endurance Wood Stains in the fourteen different colors.

To Devote Entire Effort to Engine Business

The Fuller & Johnson Mfg. Company, whose General Offices and Works are at Madison, Wis., announce that the development of their gasoline engine business has been such that in the mutual interests of their dealers and themselves, they have found it advisable to make arrangements...
ARCHITECTS and Builders everywhere know that Underfeed heating plants add to the renting or selling value of any building, because they insure clean, even heat at least cost. It is possible for builders themselves to add to the comfort of their own homes and at the same time make a splendid, dividend-earning summer investment that will insure big savings next winter and every winter. Instead of repairing an old heater it will be splendid economy to make a complete job of it—take it out and put in an Underfeed. The Underfeed—with all coal fed from below, the rational coal-burning way—reduces cost of heating so materially that it soon pays for itself. No other heating plant on the market can meet the Underfeed's all-the-year-round slogan—backed up as it is by convincing, corroborative testimony from Saskatchewan and Canada's Northern provinces to the frosted belts of the South. Here it is:

The Peck-Williamson Underfeed HEATING SYSTEMS WARM AIR FURNACES - STEAM-HOT WATER BOILERS

Canton, Ohio, is one of the most notable of many enthusiastic Underfeed strongholds. Pictured above are two Underfeed heated Canton homes. One owner—A. Castell, of 400 Springfield Ave., writes: "I have, at the present time, about one-half dozen furnaces of different makes, located in other buildings I own. From my personal experience with these furnaces, I consider the Underfeed feature superior to any in the market."

H. A. Schrantz, 521 Dueber Ave., the other house-owner writes, after four years' satisfaction with the Underfeed:
"It maintains an almost uniform temperature of 75 degrees, regardless of the severity of the weather; never less than 65 degrees over night during zero weather—the real test of a furnace. It is most economical. For firing from Oct. 1 to May 1, my coal bill has never been over $17, and in a few years the Underfeed will have saved its initial cost."

Let us tell YOU why it will pay any architect or builder to specify the Underfeed. Underfeed heat means all-time satisfaction at least possible cost.

Write for YOUR copy of Underfeed Furnace Booklet or Special Boiler Catalog. We'll be glad to send a lot of fac-simile testimonials. Heating Plans of our Engineering Corps are FREE.
whereby their entire time and efforts can be devoted to the designing, manufacturing and selling of gasoline engines, and to this end they have sold out their implement business to the Madison Plow Co., Madison, Wis.

The Fuller & Johnson gasoline engines have, within a comparatively few years, taken a stand in the front ranks, this being due to the fact that they were properly designed, manufactured in the best manner, both as regards material and workmanship, and sold at fair prices, quality considered. The management of the Fuller & Johnson Co. is in the hands of men who are practical mechanics, whose experience has been gained in connection with work of the highest class, and it will always be the aim of this company to supply goods of the highest quality.

**How Steel Bins Aid in Fire Protection**

The matter of fire protection is of the utmost importance in every business, but it is a striking fact that thousands of merchants and manufacturers take no cognizance of the necessity of this protection. They are generally disposed to let well enough alone—inasmuch as they "haven't been burned out yet, so let everything take care of itself as it is."

These are the men who, after the disaster that comes unexpectedly upon them and overwhelms them, ruefully look back upon their old time optimistic complacency and condemn themselves for being too narrow-minded to fortify and protect themselves against the fiery foe.

Such examples as these have opened many eyes and to the doctrine of forethought is due much of the success of steel. Business men, heeding the necessity of protection against every untoward contingency, are building bulwarks of steel about them. They have discarded wood and others are following their example.

So, as the transition progresses, it reaches out into every office, store, factory, warehouse, jobbing house and so on down the list. The cry on every hand is "Fireproof—it must be fireproof!" Business men demand fireproof buildings because they want their property, their stock, their business thoroughly protected.

An essential in this all-around fireproofing is the discarding of everything that is a fire contributor. One of the latest and newest products of this kind placed on the market for store, factory and warehouse fixtures is the steel bin, manufactured by the Berger Mfg. Company of Canton, Ohio.

Steel bins are coming into favor for storing small stock of every description in bulk. Hardware dealers and other merchants are using them, while they are being introduced into many factories where it is essential that small parts be kept conveniently at hand. They are constructed of steel and reinforce the other steel construction of the building, for they do not feed flames but do assist in the general plan of protection.

**One Machine Takes Place of Complete Machine-Shop**

Among the many devices and machines now on the market, whose purposes are to lighten the labor and increase the profits of carpenters, builders and contractors, a leading place must be awarded to the Famous Universal Woodworker.

To those accustomed to the ordinary types of woodworking machinery—that is, those machines which do only one kind of work—the Famous Universal woodworker comes as a revelation. Even to those who have used other types of woodworkers the principle and operation of the Famous is an eye-opener.

No less than sixteen different kinds of millwork can be done on this machine. In fact it is a complete machine shop in itself comprising, practically, all the machinery that the
Give Good Varnish Advice to Your Customers

The varnishing of the floors, doors and other woodwork that you build is very important. It's so important you ought to help see that good varnish is used. By recommending Berry Brothers' Varnishes you will be giving the best possible varnish advice—advice, which if followed, will greatly increase the beauty, and permanent satisfaction of your own handiwork.

Berry Brothers' Architectural Varnishes

Meet all requirements for highest grade finishing in buildings.

TRADE LIQUID GRANITE MARK

For finishing floors in the most durable manner possible. Its quality has made it the best-known and most widely used of all varnishes. There is no substitute.

WOOD LUXEBERRY FINISH

For the finest rubbed (dull) or polished finish on interior woodwork. It has for years been the standard to which all other varnish makers have worked.

ELASTIC INTERIOR FINISH

For interior woodwork exposed to severe wear and finished in full gloss, such as window sills and sash, bathroom and kitchen woodwork, and stands the action of soap and water to an unusual degree.

ELASTIC OUTSIDE FINISH

For front doors and all other surfaces exposed to the weather. Dries dust free in a short time and possesses great durability under the most trying weather conditions.

Send for our free booklet: "Natural Woods and How to Finish Them."

Berry Brothers, Limited
Established 1858.

Largest Varnish Makers in the World.

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

Branches: New York, Boston, Philadelphia, Baltimore, Chicago, Cincinnati, St. Louis, San Francisco.

Dealers: Everywhere.
average carpenter and builder has use for. Simple adjustments change the character of the machine from a band-saw to a planer, from a hollow chisel mortiser to a jointer, and so on. When necessary three men can work on the machine at one time, each performing a different class of work.

Over six hundred Famous Universal Woodworkers are in use and not one user has ever had cause to be otherwise than pleased.

The Sidney Tool Co., Sidney, Ohio, who are the builders of the Famous Universal Woodworker, will gladly send full particulars of their machine upon request.

Old Mahogany and Old Tools

In a little side street in New York, is a tiny cabinet shop that might have been transplanted from London, it is so quaint, inside and out. The owner is a little stoop-shouldered old man who has lived and worked there as long as anyone in the neighborhood can remember—lived and worked in the gray old place in the companionship of old mahogany and his tools.

He repairs antique furniture for some of the best decorators and furnishers in town, and he makes fine pieces to order from their designs. His work is often of such a delicate nature that in fitting and finishing the difference of a hundredth of an inch in the thickness of a shaving might spoil the hang of a door, or the proper adjustment of a moulting. He is as methodical in his work as he is in exercising his conscience in giving his customers the best work that is in him. He sticks to old traditions and to old-fashioned quality.

The one departure from his love of old-fashioned ways is the fixture that dominates the little room, immediately one enters it. Above his work bench, fastened to the wall between two windows, is a modern tool cabinet, completely equipped. If you opened it you would find some tools that have been dipped in melted paraffin and wrapped in soft paper. They are not in use.

On the work bench in front of him lies a saw that has been worn to about half its original width from filing over and over again. The old man picks up three chisels that have been sharpened and resharpened until they are half their original length. "These," he says, "have been with me twenty years, and I will never use any others of this kind as long as I have them. That saw I bought at the same time, and no other could take its place. The new tools are the same make as the old ones, but I stick to old friends," and he bent the point of the saw to the handle, released it and it flew back with a ring. The tools, new and old, were Keen Kutter tools. If the old man lives for another twenty years, he knows he will get the same service out of the new tools that he has had from the old ones.

His Keen Kutter cabinet helps him in his love of order and in keeping his beloved tools in fine condition. It makes a place for everything, and he can quickly put his hand on even the tiniest bit. The natural tendency is also to replace any tool at once when he is through with it, and no tool ever rubs against another or becomes nicked or damaged. He would not go back to the old chest because in this case the new way is better than the old.

The superiority of Keen Kutter tools has been demonstrated by this old cabinet maker. He will have no other kind because they have proved themselves by the hardest kind of test—the trial of time.

For any man who uses tools, continually or occasionally, Keen Kutter tools are claimed to be best, because they are the final expression of quality of material and workmanship. It is the boast of the manufacturers that the temper of the steel is perfect, the handles are always of straight-grained wood, the best of its kind for a certain purpose, and real

CONTRACTORS

Here’s your engine. Run all day with a mighty little attention.

The Galloway
Gasoline Engine

Will carry the big loads and at low cost of upkeep.

SIMPLEST ENGINE BUILT

Only four things to do: Turn on switch, turn on oil, turn on gasoline, give fly-wheel a start. That’s all. Even the ordinary laborer will have no trouble with it.

THIRTY DAYS FREE TRIAL

Get it Right Out on the Job and Work it to Your Limit

The “Galloway” engine is not overspeeded and is rated by actual brake tests. They are made in all sizes from 1½ to 28 H. P. They run on gasoline, naphtha, kerosene or distillate.

On the larger sizes, if not convenient to pay all cash, we will take note for balance at regular rate of interest for six months.

Write us for free information on stationary and portable Gasoline Engines from 1½ to 28 H. P. Our prices are RIGHT and the engine is BUILT FOR SERVICE

WILLIAM GALLOWAY CO.,

1145 GALLOWAY
WATERLOO, IOWA
The MARK of the MAKER is your guarantee of good quality and progressive excellence. That mark is put only on the very best tools that we make, and in each case stands for definite superiority in the tool and our personal assurance of your satisfaction. On this P. S. & W. Chisel it means a special quality of tool steel, tempered and hardened by a special process and sharpened before it leaves the factory. It means a longer socket than in other makes, accurately rounded to fit the handle. It means the perfect finish of the most complete line of chisels on the market.

A Handy Book For Carpenters

Our 165-p. "Mechanics' Handy List," shown at the left, contains 35 pages of valuable shop information and a catalog of over 200 tools. Sent free at your request.
**Artistic Tile Exhibit**

One of the significant evidences of the steady advancement in the tile industry is the recent opening of the down town office and tile display room, 128 Reaper Block, corner of Clark and Washington Sts., of the prominent firm of Chas. F. Lorenzen & Co., in their new, centrally located office Chas. F. Lorenzen & Co. show a large and attractive display of Rookwood Faience and complete lines of other well-known makes of tile. The furnishings and fixtures are handsome and luxurious, and it is a delightful place in which to study the artistic effects obtained in modern interior construction by the use of decorative tile.

In this connection it is timely also to note that Chas. F. Lorenzen & Co., since May 1, have occupied their new main office and show rooms at 701-709 North Sangamon St. near Chicago Avenue, where a cordial welcome is always ex-

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**NEILS BUCK & CO.**  
Contractors and Builders  
9 S. LaSalle St.  
Chicago, May 22, 1913.  
Hupp Motor Car Co., Detroit, Mich.  
Gentlemen:—In answer to yours of the 19th inst., in reference to the Hupmobile, will say that many has been running 8,000 miles, and in perfect condition. I intend to run it the balance of the season, as I am a tender to visitors. The large, modern plant of the firm is located at this point, corner of Sangamon and Pratt Sts. and it is easily accessible from all parts of the city. The removal to new, larger quarters was made imperative by the steady growth of the business, which was established in 1897.

The products of Chas. F. Lorenzen & Co. include mantels, consoles, special interior woodwork, etc., manufactured on the premises, and ceramic mosaic, tile fireplace fixtures, etc., which are carried in stock in large quantities. The firm is now in a better position than ever to execute contracts, large or small, for work of this character on short notice. Its facilities and equipment are unsurpassed.

Among the important tile contracts executed by this company in recent years are the Kesner building, 17 stories, corridors, stores and toilets; Heisen building, 22 stories, corridors, etc.; Blackstone Hotel, refrigerating rooms, first to eleventh floors inclusive; Chicago and Northwestern terminal station, refrigerating rooms; Y. M. C. A. building, northwestern branch; Stoddard-Dayton Automobile Company's...
We Pay the Freight

No. 104
9x9 or less
$28.00

No. 101
9x9 or less
$40.00

No. 52
Up to 8x9
$15.00

We Pay the Freight

No. 102
Up to 9 ft. in heighth
$22.50

No. 110
Up to 9 ft. in heighth
$17.00

No. 100
Up to 9x9
$33.00

No. 109
Up to 9 ft. in heighth
$19.00

No. 105
Up to 9 ft. in heighth
$22.50

No. 64
Roman
Up to 9 ft. in heighth
$38.00

Chicago Grille Works, 828-838 Wells St., Chicago, Ill.

Will ship any of the above openings measurements as given, in the white, for the price quoted, freight paid to your station, if in the United States.
Cash must be sent with your order.

When writing advertisers please mention the American Carpenter and Builder
When you buy that new Mitre Box just take a look and see that the Simonds Saw is supplied with the box.

A pretty good sign that you are getting a high grade box is to find a Simonds Saw is furnished with it.

Look for the trademark; that's the way to be sure. You get a high quality manufacturer's own brand saw.

Made of Simonds Steel, as are all Simonds Hand Saws. No. 95, illustrated above, has Apple Handle, Polished Edges, Blued Steel Back. Set and Hand Filed, ready for use. Warranted. Toothed edge, 2 inches shorter than the full length of Blade.

Buy from your Hardware Dealer or write us about any kind of a Hand Saw you may want if you are looking for more than ordinary goods.

Simonds Manufacturing Company
Fitchburg, Mass.
San Francisco, Cal.
New York City
Lockport, N. Y.
Portland, Ore.
Montreal, Que.
Vancouver, B. C.
Seattle, Wash.
Chicago, Ill.
London, Eng.
New Orleans, La.
St. John, N. B.
6 Months’ Free Trial

Don’t take our word that this tool grinding, buffing and polishing outfit will save money for you. We offer you 6 months’ absolutely free use of this outfit in your own work on your own tools, and let you prove for yourself that it is a money-saving and money-making outfit for any tool user. Use it a whole half year free, and if you don’t find it a money-maker for you, send it back. The half year’s use will not cost you a cent. If you want to make your own work and the work of the men you hire count for the most profits, how can you neglect this liberal offer? Return the coupon at bottom of page for 6 months’ free trial offer.

Luther Tool Grinders

6 times faster than emery wheels
25 times faster than grindstones
Built like a high grade lathe

The genuine Carborundum wheels will not draw temper from tools; no need of cooling with water—all your tools will last longer, which means that much money saved. The wheels cut hardest steel, as emery does soft copper—it is only a moment’s work to do any job of tool sharpening, so easy in fact that tools are always kept razor keen and that means more work accomplished with less effort, which means more money saved. The wheels outwear any number of emery wheels and that means another money-saving.

Return this Coupon for 6 Months’ Free Trial Offer

This perfected sharpening, polishing and buffing Mechanic’s Special Outfit is a business and labor economy—can you afford to neglect our liberal offer? Return this coupon for 6 Months’ Free Trial Offer, and free booklet reprinting the story of Carborundum as it appeared in McClure’s Magazine.

LUTHER GRINDER MFG. CO.
17 Madison St.
MILWAUKEE, WIS.
**Write Us Now For Free Samples of Johnson's Artistic Wood Finishes**

**Johnson's Prepared Wax**

is a complete finish for all hard and soft wood—equally well adapted for use on floors, woodwork and furniture. May be used on the bare wood or over Dye, Paste Wood Filler or any finish—simply apply with a cloth and bring to a polish with a dry cloth or brush.

Johnson's Prepared Wax gives that beautiful, artistic, dull finish so much in demand. Prepared Wax does not show scratches and heel marks, and work finished with it may be easily kept in perfect condition.

Johnson's Prepared Wax contains a larger percentage of hard, expensive wax than other wax finishes on the market, and for this reason it covers a larger surface and can be brought to a more beautiful and lasting polish. It does not become soft and tacky in warm weather or warm climates—or from the heat of the body.

Ask your dealer for free Sample of Johnson's Crack Filler

**Johnson's Crack Filler**

is a paste filler for cracks, crevices and nail holes. Should be applied the same as putty, but it is much superior to that article as it does not chip, crack or come out of place. When Johnson's Crack Filler has hardened, it takes Johnson's Wood Dye the same as the wood.

Ask your dealer for free sample of Johnson's Crack Filler and test it out. If your dealer cannot supply you, write us. We will send samples, also Instruction Book Edition A. C. B. S. all free when requested.

S. C. Johnson & Son, Racine, Wis. "The Wood Finishing Authorities."

wire inside at all. The manufacturers guarantee this column not to crack, bulge or split in any way.

The Fitzgerald-Speer Co. can furnish these columns, either plain or fluted, in any length from 8 feet to 26 feet and from 8 to 24 inches in diameter. These columns have a stave thickness of from 1 to 3 inches, and can be furnished in any kind of wood.

The manufacturers are looking for agents and can offer an attractive proposition to up-to-date carpenters and builders. Further particulars and price lists can be obtained by addressing the Fitzgerald-Speer Co., Pen Argyl, Pa.

**Old and New in Grilles**

Fashions change in buildings as well as in clothes. The tastes of our fathers and grandfathers were different from those of our own, in the interior decoration of their houses the same as in matters of dress.

The grille furnishes one of the most striking examples of this. The accompanying illustrations show the contrast between the popular style of today and that of former times.

Twenty or thirty years ago thousands of these delicate and elaborate fret-work grilles were sold. Every residence that made any pretensions at being high class had to have one of them and with their festooning draperies they were thought to be the very acme of elegance.

Today, however, the style is changed and where one of the light, fancy spindle grilles is sold, a hundred of the other sort, with the heavy columns are put up.

It has always been something of a mystery how the grille makers were able to turn out the fine delicate work necessary in the old style grilles. Expensive woodworking machinery was required and the work was done with infinite pains. This same care is used, however, today in the manufacture of the newest styles. For high quality work great care is needed.

When high quality is mentioned in connection with grilles, those who know think at once of The Chicago Grille Works, 826 to 838 Wells street, Chicago. This concern operating during the past nineteen years, has built up an enviable reputation for high quality work in the manufacture of colonades, columns, consoles, grilles, etc. In the past their product has been sold through jobbers, but now they have made it possible to buy direct from them, saving the middleman's profit. They will be glad to mail you one of their catalogues upon request.

Every reader of the AMERICAN CARPENTER AND BUILDER should have a copy of it.
Let us send you a beautiful panel frame showing our Endurance Wood Stains in fourteen different color effects. At your leisure you may then select the particular stain best adapted to your color scheme.

For the greater convenience of the members of the architectural profession, we maintain a special department devoted exclusively to producing any special efforts required, and to the reproduction of any color scheme suggested. The services of this department are offered to architects free of charge, and all are invited to avail themselves of its benefits and privileges.

The Quality of Endurance Stains

Glidden’s Endurance Wood Stains intensify the natural beauty of all woods.

They are penetrating yet they do not raise the grain. This is due to the special process used in their manufacture.

All the colors are permanent.

Glidden’s Endurance Wood Stains are superior to oil or spirit stains, and their great covering capacity makes them especially economical.

Without any exaggeration whatever, Glidden’s Endurance Wood Stains are strikingly superior to any other stains that have ever been placed on the market.

You should see our Light and Dark Mahogany.

We make a specialty of finishes for Red Gum and California Fir Wood, which woods are now being extensively used.

Glidden’s Green Label Varnishes

are well known and are well established among American architects as the highest grade and standard of quality.

Specify our varnishes and we will see that they are used.

Write us for detailed information on Glidden’s Endurance Wood Stains and for our Descriptive Catalogue of Glidden’s Green Label Varnishes.

We will send demonstrations of our materials on request.

See Sweet’s Index.

THE GLIDDEN VARNISH CO.

Factories: Branch Warehouses:
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Sixth City
King's Elements of Woodwork

A book of this title by Charles A. King, Director of Manual Training, Eastern High School, Bay City, Mich., has just been issued by the American Book Company, of New York. It is a book of 150 pages and contains 59 half-tone and line engravings; it deals with the growth, qualities, and uses of the different kinds of wood, and the manufacture and care of lumber, from the first steps in logging to kiln drying. There are chapters upon the selection, care, and use of the important types of woodworking tools, the manufacture and use of glue and sandpaper, and the different materials and methods used in staining and finishing woods. If facility is acquired to care for and use the tools described in this book, little difficulty will be experienced in the use of other and more complex tools of the same type. This book is adapted to the student of manual training, the apprentice and the amateur woodworker, and should find a place in every institution in which elementary woodwork is taught.

Curing a Hall of "The Echoes"

The problem of detecting the sources of troublesome echoes in an auditorium, and of doing away with them, was once regarded as insoluble. It may now be added to the list of similar problems that modern science has solved, although the solution requires some delicate and difficult work. In the fine auditorium of the University of Illinois the clever plan was recently adopted of using a noisy arc-light as a source of sound. As light and sound thus originated at precisely the same spot, and as both are subject to the same laws of reflection, it was easy to trace the path of the sound by means of its visible companion. We quote from The Physical Review: an abstract of a report on the matter made to the American Physical Society by F. R. Watson:

"An investigation of the acoustics of the University of Illinois Auditorium has been carried on for more than two years. The auditorium is shaped nearly like a hemisphere, with several large arches breaking the regularity of the surface. The dimensions of the building are great enough to allow echoes to exist in addition to a reverberation. In the dearth of definite information about echoes, several methods were used to trace the path of sound in the auditorium. An attempt to locate echoes by generating a sound and listening with the ear met with only partial success. "The most satisfactory method involved the use of an alternating arc-light at the focus of a parabolic reflector. In addition to the light, the arc gave two sets of sounds; one sound being a hum due to the alterations of the current, and the second sound a successive 'spitting' of the arc. This latter sound was of short wave-length and therefore experienced little diffraction. It was also of suitable intensity to allow the reflected sound to be heard easily. The bundle of light rays included also a bundle of sound rays, the sources of both being at the same place and subject to the same law of reflection. The path of the rays was easily found. The observer could see where the sound rays struck by noting the position of the spot of light. To trace successive reflections, small mirrors were fastened to the walls and the path of the reflected light followed. This method allowed a complete 'diagnosis' of the acoustic troubles of the auditorium to be made, so that methods of cure may now be applied intelligently and with confidence."

The Band Saw in the Shop

The band saw is the most important machine in any wood shop, especially that of the carpenter, contractor or builder.

CORTRIGHT Metal Shingles

Since Cortright Metal Shingles became so successful 26 years ago, a lot of manufacturers have thought that all they had to do was to make a shingle to look something like Cortrights, and it would be equally successful. But they've failed.

After they sell a man a roof with the argument that it's "just as good as Cortrights" it usually proves so troublesome as to discourage him altogether with metal shingles.

Even some carpenters and builders have been fooled by this "just as good" argument, and it's still a worse investment for them than for the property owner, for if you lay a roof that's only going to be a yearly annoyance to your customer you lose many times your original profit.

That's why it is so important that you should know these four designs, and look for the words 'CORTRIGHT REG. U.S. PAT. OFF.' which are stamped on the top of each genuine Cortright Shingle. (See where the arrows are pointing.)

And to prevent you from taking any kind of risk, why don't you send for our two free roofing books that you can keep on hand for reference?

Write for them right now before you forget, or just simply sign and mail us this attached coupon.

Cortright Metal Roofing Company

PHILADELPHIA and CHICAGO

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
You should investigate the remarkable qualifications of Series No. Seven 4 Ton Motor Trucks

This truck because of the excellence of its design, its abundant power, its unusual strength, marks a new era in heavy duty motor truck service. Its low cost of upkeep, its freedom from repairs, its ability to stand the extreme punishment of continuous service under severest conditions are causing comment in all quarters. An absolute adherence to the highest possible standard of manufacture is and will always be the foundation of Speedwell Truck prestige.

A few prominent features of this truck are:

A short wheel base (115 inches) without sacrifice of loading space and without overhang. (Loading platform is 12 ft. 6 in. long.) This short wheel base is obtained by placing the motor under the front seats and makes this truck far easier to handle in traffic and around loading stations than other types of equal capacity. An improved detail of construction, the entire seat cage swinging up from the frame, in either direction, makes the motor more accessible than when covered by hood with driver's seat behind.

Ample power (a 4-cylinder 50 H. P. motor) and unusual strength in the construction of all members spells continuous service under all conditions.

Power transmission that avoids the use of long shafts in the drive line—avoiding vibration and twisting of shafts. Provision is also made to minimize the strains of starting and stopping.

Unusually large tire equipment lessens the cost of upkeep of this important detail.

Accessibility of all units—any unit being removable, when necessary without tearing down other units.

Most important of all is our sterling principle to build all Speedwell products honestly and well—to exploit nothing that has not been fully proven and to stand back of our output to the limit.

The Speedwell Four Ton Truck Equipped With Stake Body, $3500

We build a 2 ton truck at $2950; a 6 ton at $4000, to which the above details of design apply; also trucks of specially long wheelbase when necessary for such work as trucking lumber, pipe, etc.

Write for Speedwell Truck Information

Trucking problems are so diverse in their character that it is desirable to state in requesting truck literature, the exact nature of work you require of a truck—the average weight of loads, distance of hauls, number of stops, road-beds and grades. This will enable our Service Department to give specific information regarding trucks most suitable for your needs.

SPEEDWELL MOTOR CAR CO.

610 Essex Avenue, DAYTON, OHIO

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
The Beginning of His Success

Success has dawned for many a man with the marking of the I. C. S. coupon. It was a simple act—an act that placed him under no obligation—but it proved to be the beginning of a career.

Trained men are in demand everywhere. There is not an important labor-employing concern in the world that has not openings for men prepared to make good in positions. "We always need trained men," said a prominent manufacturer recently to a young man applying for a position. "There are not well-trained men enough to meet the smallest part of the demand," declared a leading magazine in a strong editorial. The Help Wanted columns of trade papers teem with advertisements for trained men.

Draftsmen are wanted. Can you trace out a machine or a building? Foremen and Superintendents are wanted. Can you plan and direct work? Chemists are wanted. Can you make an analysis or build up a useful compound? Trained Electricians are wanted. Would it be safe to turn you loose in an electric plant? Civil, Mechanical, and Mining Engineers are wanted. What does that mean to you? Advertising men are wanted. Can you write a business-pulling ad? The Civil Service needs men. Are you prepared to pass a Civil Service examination?

The marking and mailing of an I. C. S. coupon has been the beginning of success for thousands. Why not find out about the I. C. S. plan? It will place you under no obligation whatever, but will bring to you a full explanation of the I. C. S. salary-raising system that has been used by thousands to change poor jobs into good positions and "wages" into salaries.

Mark and Mail the Coupon NOW.

---

Fay & Egan No. 50 Special Patent Band Saw

Fay & Egan's patented "knife edge" straining device. This device is so sensitive that it will compensate for even the smallest chip sticking to the blade or rim of the wheel. Broken blades are practically unknown where this strain is used, the sum saved in this respect alone amounting to quite a little in a short while.

This patented strain in connection with the solid lower wheel permits the use of a thinner blade at a higher speed than was ever known before, increasing the quality as well as the quantity of the work.

The square form of column, cast in one piece, gives great rigidity to all working parts. For pattern work, the table is arranged to angle to 45 degrees with micrometer adjustment.

Further information regarding this band saw may be obtained by addressing the manufacturers, J. A. Fay & Egan Co., 545-565 W. Front St., Cincinnati, Ohio.
WHEN YOU BUILD (WHATEVER YOU BUILD) BUILD "FOR KEEPS"!

This is BUYING Time "THE WOOD ETERNAL"

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

"CYPRESS—AND NO SUBSTITUTES"
"X L" Metal Shingles

The latest addition to the immense lines of sheet metal products of the Canton Art Metal Company, Canton, Ohio, is the "XL" metal shingle. This is a heavily embossed shingle of beautiful design, and is provided with their improved side lock construction, which is doubtless already well known to many of the readers of the AMERICAN CARPENTER AND BUILDER. It makes allowance for the necessary expansion and contraction and at the same time makes an absolutely tight fitting side lock. These shingles are made in 10 by 14 inch size and are furnished in both galvanized steel and painted tin.

Another of the leading lines of this company is their metal hip shingles for covering wood shingles on the hips of buildings. These metal hip shingles are nobby in appearance and stamped deep and bold. They are made of Galvanized Steel or Painted Tin, in two sizes: 4x7 inches and 4x9 inches.

Roofings That Need no Painting

Times have changed since the good old days when we used to climb up on our roofs every year or two and put a heavy coat of paint over them to keep them from getting wet. Some farmers used to think that roofings were made to get wet and they neglected the paint, and in a little while needed a new roof. The rest of us spent our money and labor painting our roofings with great regularity, since that was the only way to get satisfactory service out of them.

Recently the whole roofing business has been changed by the introduction of roofings which need no paint, of which Amatite Roofing is the most favorably known. These roofings have a surface of crushed mineral matter, and of course this mineral matter does not need any protection from the weather. Accordingly a mineral surfaced roofing never requires any paint whatever.

This invention is a clear benefit to the owner and it does not cost him any more either. Amatite Roofing, for instance, costs considerably less than painted roofings of the same weight.

You can get full information and a free sample from the manufacturers on request. Address Barrett Manufacturing Company, New York, Chicago, Philadelphia, Boston, Cleveland, Pittsburgh, Cincinnati, Minneapolis, St. Louis, Kansas City, New Orleans, London, Eng.

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To Contractors, Builders and Sheet Users:—The accelerated acid test as a proof of durability or service, is discredited by leading authorities. This is the position we have always maintained. However, if in the trade there are those who continue to believe that it has any value at all, we respectfully request them to make full proof of the durability of any sheet steel by a test that will show resistance to such acid test, equal to or better than any iron or steel sheets now manufactured.

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Don't Take Our Word For It—
Let Us Send You A Sample

Try Utility Wall Board on just one job—Note how light in weight and how easily handled it is—Yet how stiff and substantial. Try it under the worst possible conditions and note how staunchly it stands up. No other wall board that was ever made is so impervious to weather conditions—so positively water proof—and at the same time so readily adapted to any style of artistic decoration.

UTILITY WALL BOARD

is made of exceedingly tough, durable fibre. It is thoroughly water and weather proof—and is the only wall board ever made that will not shrink nor warp. You can put wall paper over it with perfect safety. A wall or ceiling finished with Utility Board is permanent—there to stay as long as the building stands.

A New beautifully illustrated book of interiors will give you some valuable ideas. Send for it at once. Also for the FREE Sample.

UTILITY WALL BOARD is Sold Through Dealers in Building Supplies Everywhere

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Build Your Own Boat

"Any man experienced unnecessary, can build a boat by the use of our boat frames and patterns. The picture shows a 40 ft. Cruiser frame ready to take apart and crate for shipment. Knock-down frames from canoe of six men. From the canoe to the 32 ft. motor yachts. People of wealth buy them, have the work finished by local hands, and are at least 50% cheaper. People of limited means purchase them, finish the work themselves, and save at least 30%.

DEFOE BOAT & MOTOR WORKS
3213 State Street, Bay City, Mich.

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Wood Mantels
Sold Direct from Factory to You

Every contractor should have our Big Catalog

There is Money in selling our Mantels

W. J. NORTHCROSS MANTEL CO.
66 So. Sec. Street, Memphis, Tenn.
Crescent Machine Co. Issues New Catalogue

Although about five months ahead of the date, the 1912 catalog of the Crescent Machine Co., Leetonia, O., is ready for distribution. As to new features there are several articles not mentioned in former Crescent catalogs, notably a 30-inch planer, a post borer, and band saw guards. All users of the wood working machinery will be interested in this book, and copies will be mailed to all readers of American Carpenter and Builder who will send their name and address.

Tannewitz Type “C” Woodworker

The “Tannewitz” Type “C” Woodworker is their latest machine on the market. It has a number of very good features among which are the following: There are three distinct machines permitting three men to work at one and the same time. It is strongly built, being made entirely of cast iron (no wood or angle frame work being used). It is complete with all necessary equipment and goes at the lowest price a machine of this kind was ever sold for.

The three machines consist of a full sized saw bench, an 8-inch jointer and a mortising and boring machine. The equipment consists of two 10-inch saw blades, two jointer knives, four gauges, eight bits, belting, countershaft and wrenches. The Tannewitz Works guarantees this machine to be exactly as represented or your money back. This same equipment can also be supplied with a genuine “Olds” Gasoline Engine. This gives the user a complete mill and reliable power plant. Literature describing this outfit will be sent anyone interested by the Tannewitz Works, Grand Rapids, Mich.

New Pattern-Making Book

The Manual Arts Press, Peoria, Ill., has just issued a revised and newly illustrated edition of “Wood Pattern-Making,” by Horace T. Purfield, instructor in pattern-making and foundry work, High School, Fort Wayne, Ind. The work has been prepared as a text book in pattern-making for use in manual training schools. To suit the needs of many schools the first part of the book is given over to chapters describing

NOTICE!

This space reserved for the New Oshkosh Portable Saw Rig. If interested don’t buy before you write us for particulars on the best and cheapest Saw Rig manufactured. Folders describing this Rig ready at the time this paper reaches you.

OSKOSH MFG. CO.
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HOW TO READ PLANS
A Valuable New Book
By Charles G. Peker

60 Pages (6 x 7 Inches)
43 Drawings in Text
8 Large Folding Plates
Handsomely Bound in Cloth

PRICE, 50 CENTS

Sent post-paid on receipt of price.
Your money back if you are not pleased.

M ANY building mechanics are handicapped from getting more pay because they are unable to read plans and work from a drawing. It is for these men that this book was prepared, as it simply explains the meaning of the various lines; plans, views, elevations, sections, scales, blue prints, devices, symbols, etc., to be found on a set of plans. The book is finely illustrated by 43 illustrations in the text, and 8 large folding plates giving the full plan of a 6-room frame house. This set of plans alone is worth many times the cost of the book; an architect would charge at least $25 for their equal.

It is one of the most valuable books ever put out for building mechanics, as its information means increasing a man’s salary. It is pretty safe to say that to the man who cannot read a drawing now this book will mean at least $50 more pay during the first year he has it.

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178 Fulton Street, NEW YORK
For Best Results

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YOU can avoid all chance of trouble due to improper varnish by always using Lowe Brothers 'Little Blue Flag' Varnish—certain to stand up under severest conditions as shown by tests in actual service—proven to give best results, to go farthest, to look best for the longest time. As high in quality as 'High Standard' Paint—as economical to use. Then use 'Little Blue Flag' Varnish for every purpose.

Write for sample panels, descriptive folder and facts about buildings finished with 'Little Blue Flag' products.

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SAWS

EVERY SAW BEARING OUR BRAND IS FULLY WARRANTED

We have been making saws for more than 55 years. In that time we have been constantly experimenting at great cost, and have perfected our machinery to make every saw a first-class saw—superior to any other saw on the market. We use the best materials in making every saw blade, and we stand behind our saws with the greatest of confidence. We guarantee every saw made by us to be the most economical and durable saw on the market. We also manufacture Machine Knives of every description.

ALBANY SAW WORKS CO., Established 1858
70 Waterluse St. ALBANY, N. Y.

This Rule gives length of rafters for one foot run. If you know the length for one foot run it is easy to get the full length of your rafter, simply multiply by the full run of your rafter or half the width of your building. The outside inch figures indicate the rise of your roof in inches to the foot, look under these for length of rafters per foot run.

Nicholls Rafter Framing Squares—Also Our New Take-Down Square has this rule.

Nicholls MFG. CO. - OTTUMWA, IOWA

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
the common bench tools and their uses, pattern turning, lumber, the reading of drawings, etc. The illustrations are by Mr. Edwin V. Lawrence, whose work is familiar to many of the readers of the AMERICAN CARPENTER AND BUILDER.

**A Gauge Hatchet**

The Gauge Hatchet (No. 44), manufactured by L. A. Sayre & Son of Newark, N. J., and illustrated herewith is an outgrowth of the loose gauges that have been in use on the Pacific Coast for a number of years. The loose gauges, however, have never met the requirements in shingling as they would shift on the hatchet, thus changing the lap of the shingle.

This No. 44 is a positive gauge and cannot shift, as it is screwed through the blade of the hatchet; for which purpose three holes are drilled through the blade. It is possible to gauge by 1/8-inch from 4 1/2-inches to 5 1/2 inches. The hatchet is made from extra quality crucible steel and is warranted against all defects.

L. A. Sayre & Son also make a complete line of lath and fruit box hatchets, also variety handled pruning shears. Write to them for further information.

**Severe Test of Utility Wall Board**

A test that proves very conclusively the imperviousness of Utility Wall Board against the extremes of heat and cold and dampness, has just been completed by Mr. C. A. Heppes at the factory in Chicago.

The hardest problem that wall board manufacturers have to solve is the problem of making a board that will not shrink or warp when subjected to extremes of heat and cold, and that will not absorb moisture.

Six months ago, Mr. Heppes felt very confident that he had solved this problem. In order to satisfy himself absolutely, however, he decided upon a test which is probably about the most severe to which wall board was ever subjected.

He selected a thin brick wall in the most exposed portion of his factory building, and attached the wall board to this wall, putting it on in the ordinary way, as close to the bricks as possible. He then covered the wall with wall paper so that the slightest sign of shrinking or warping would show immediately. Next he placed a row of steam pipes about an inch from the wall along its entire length. These pipes were used to heat the room, and, of course, became very hot during the day and cold at night. All this was done in January of this year. The outside of the wall, of course, was subjected to the extreme cold of the winter weather while the inside was hot from the steam pipes. At night both the inside and the outside were subjected to the cold. Later in the spring, the heat in the steam pipes was turned off and the moisture from the inside of the factory combated the cold from the outside.

After six months of this kind of severe treatment, the wall board shows not the slightest sign of shrinking or warpage. It is almost impossible to tell even by feeling, where the joints have been made and even in the corner, where is the

**Carborundum Niagara Grinders**

SOMETIMES tools get tired on the job—it takes a grinder to bring them back to a keen working edge—Carborundum Niagara Grinders are all equipped with Carborundum Grinding Wheels—the wheels that cut an edge on a tool quickly and easily without heating or drawing the temper.

Castings strong and durable—bearings and alignment mechanically perfect—equipped with tool rests and chisel guides—made in 14 styles and sizes for hand and foot power.

The Niagara Grinder No. 2 is a handy little machine—can be carried to the job in your tool chest—The Carborundum Carpenter’s Round Combination Bench Stone and a bottle of Carborundum Temperoil will just complete your outfit for keeping all tools in perfect condition.

Carborundum Niagara Grinder No. 2, complete $4.00
Carborundum Round Combination Stone, No. 107 1.00
Carborundum Temperoil, 1/2 ounce bottle .10

FROM YOUR HARDWARE DEALER OR DIRECT—SEND FOR THE CATALOGS

THE CARBORUNDUM COMPANY, Niagara Falls, New York

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
Asbestos "Century" Shingles

The Roof that Outlives the Building

The average property owner badly needs expert advice in choosing his roof. He's too apt to assume that every roof is as good as it looks when it is first put on.

It's only when bills for repairs and painting pile up that he realizes his mistake.

Asbestos "Century" Shingles are the only roofing in the market that combine architectural beauty with absolute and permanent protection to the building.

Asbestos "Century" Shingles are adapted to all architectural styles. They come in many shapes, several sizes and three colors — Newport Gray (silver gray), Slate (blue-black) and Indian Red. It's worth your while to talk with a responsible roofer about Asbestos "Century" Shingles — or write us. Send for Booklet "Everlasting 1911".

The Keasbey & Mattison Company

FACTORS

Ambler, Pennsylvania

PROTECT YOURSELF FROM FIRE

THE house on EACH SIDE of the burned one shown above was roofed with our Metal Shingles! THEY COULDN'T BURN! Photo of this house badly burned, taken in Macon, Ga., which DID NOT have our Shingles. Not only are they wear-and-moisture-proof, but FIRE-PROOF! One of our latest patterns (Cooper's Diamond Tile) shown here on the left. AN INEXPENSIVE SHINGLE, A TIME AND FIRE DEFYING SHINGLE! Write for NEW CATALOG giving ALL information. Also free samples

NATIONAL SHEET METAL ROOFING COMPANY

JERSEY CITY, NEW JERSEY

THE FIRST PEOPLE TO MAKE METAL SHINGLES

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
Does Iron Break From Fatigue?

The condition called "fatigue" in metals is very little understood. Its very name is only an analogy. Muscular fatigue is now thought to be a toxic effect caused by poisonous products of muscular work; but metallic fatigue is simply a loss of strength due to some sort of molecular rearrangement, often consequent upon overstrain. A recent French writer asserts that "fatigue" has been rather overworked as an explanation of mysterious failures and breakages, and serious disasters might be avoided by looking more deeply into their real causes. Some interesting notes on this subject have been presented in the Literary Digest, translated from the French publication, Cosmos.

"For some years it seems to have been the fashion among engineers to adopt the 'fatigue of metals' as an explanation of all sorts of accidents, either in railroads or in metallic structures, public or private. This is evidently convenient, but perhaps a little too easy, as is noted by Prof. Leon Guillet, of the chair of metallurgy in the Conservatoire des Arts et Metiers. The 'fatigue' so often incriminated may evidently take place, and may result in a rupture of the metal, which may bring on the most serious accidents. But, on the other hand, it is highly possible that we may be tempted to blame this for accidents whose exact cause we have been unable to discover. In any case we may say that this cause is generally difficult to find because we cannot place side by side the piece of incriminated metal and the initial product from which it was formed.

"Prof. Leon Guillet is inclined to think, with considerable probability, that numerous ruptures are due to the fact that the metals have undergone defective thermic and mechanical treatment, and he condemns the imprudence of engineers who use metals fresh from the forge or the mold for making pieces intended to bear a considerable strain. In particular he objects to the custom of subjecting to strain cold-drawn tubes, that is to say, metal twisted and deformed to a fatal extent, without being afterward tempered to correct its fragility. The limit of elasticity is yet very badly determined, and it may happen that it is exceeded in bodies so heterogeneous as metallurgical products, especially iron and steel. The author definitely remarks that this limit is very small in products made homogeneous by reheating. This opinion should not be forgotten, for our present means of investigation hardly permit us to follow the alterations that take place in metals through fatigue; thus it is well to observe the greatest prudence in the interpretation of results whose causes often escape us.

Award Made in Cement House Competition

The competition for designing a concrete bungalow held by the Cement Products Exhibition Co., 72 West Adams Street, Chicago, closed on Saturday, June 17. A great number of designs were submitted by architects and draftsmen from all over the country. The plans have been on exhibition in the offices of the Cement Products Exhibition Co. for the past few weeks.

The jury of award in the competition, consisting of Messrs. Hugh M. G. Garden, Sam A. Marx and Walter Burley Grif-
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fin, all of Chicago, made their report on June 21. The jury recommended that the amount of the first three prizes be divided equally among three of the contestants whose designs were given equal rank and were in the opinion of the jury of equal merit. The prize money was distributed accordingly, $100.00 being given to each of the following:

Federick J. Meseko, New York City.
F. W. Korrick, South Bend, Ind.
Harry F. Robinson, Chicago.

Favorable mention was made of the bungalow designs submitted by the following:

Mr. Drummond, River Forest, Ill.
E. S. Sommers, Chicago, Ill.

The competition was considered successful in every way both by the Cement Products Exhibition Co. and the jury.

The program of the competition called for designs for a bungalow to cost $4000.00, not including heating apparatus, plumbing, electric wiring or fixtures. The competition was open to any architect or draftsman desiring to enter. The bungalow was to have at least two bed rooms and a total of not more than five rooms and bath. The program called for foundations of plain or reinforced concrete, hollow cement tile or plain concrete blocks. The exterior walls and interior partitions were to be of monolithic reinforced concrete, hollow cement tile or concrete blocks and cement plaster on metal lath. Wire mesh was also permissible on the interior partitions.

The principal object of the competition was to secure a suitable design for a cement bungalow to be built for Mrs. Lucile Bishop, of Chicago, who won the prize bungalow at the Fourth Annual Chicago Cement Show, February last.

Public interest in concrete bungalow construction is such that the competition was particularly opportune. The intention is to publish the plans and drawings in booklet form.

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ANY WEATHER is "Good Building Weather" when you use Bishopric Wall Board as a substitute for lath and plaster. It is cheaper and better and does away with all delays in building. It is nailed to studding dry, ready for immediate application of paper, paint, burlap, or any other kind of decoration.

FOR WALLS AND CEILINGS

This substitute for lath and plaster is made of kiln-dried, dressed lath, imbedded in hot Asphalt Mastic surfaced with sized cardboard and cut at the factory into 4x4 feet sheets, which are easily and quickly nailed to studding, ready for immediate application of wall paper, paint, burlap, or other decoration. The laths imbedded in Bishopric Wall Board give it wall strength, a guarantee against warping.

It is applied dry, is guaranteed not to swell, shrink, warp, crack, flake or blister; is clean, sanitary and odorless; is proof against moisture, cold, heat, and vermin; saves fuel in winter and keeps out summer heat; also deadens sound.

It is suitable for dwellings, factories, new partitions in old buildings, finishing attics, porches, laundries, cellar ceilings, garages, etc.

PRICE OF WALL BOARD AND SHIPMENT—Crate of 16 sheets, covering 256 sq. ft. of surface, $6.40 per crate, or $2.50 per 100 sq. ft., f. o. b. New Orleans, Cincinnati, or Alma, Mich. We ship from nearest point.

Bishopric Sheathing is Cheaper than Lumber; saves 75% in Labor; does away with Building Paper

Bishopric Sheathing is made of same materials as Wall Board, but finish is not necessarily so fine, therefore costs less. It is of uniform thickness, insuring a perfectly even surface when applied.

Bishopric Sheathing is nailed to studs, with lath and asphalt side exposed. Over lathes weather boards are nailed or cement applied.

Bishopric Sheathing makes a more solid and substantial wall than lumber. There are no gaping joints; no widening cracks due to shrinkage; no knot holes.

The Asphalt Mastic in Bishopric Sheathing is a non-conductor, moisture cannot penetrate it. It is proof against vermin. The pests cannot bore through the tough, gummy Asphalt Mastic. In applying weather-boards over laths, dead air space is left between the laths; forming splendid insulation. Does away with the expense of building paper and cost of its application.

One wagon load of Bishopric Sheathing covers an area from six to ten times as great as one load of lumber—a tremendous saving in hauling. Five thousand feet can be hauled in an ordinary wagon.

An Ideal Bishopric Home

An Ideal Bishopric Home showing Weather-boards over Bishopric Sheathing, lath side exposed, also Bishopric Roofing over Bishopric Sheathing — (smooth side of sheathing exposed)

The cost of applying Bishopric Sheathing is but $2.50 per 1,000 feet—A SAVING OF ABOUT 75 PER CENT. Furthermore, 1,000 square feet of wood sheathing covers but 750 feet of surface. 25% less being due to tonguing and grooving. In Bishopric Sheathing 1000 sq. ft. covers 1000 square feet of space.

Ideal Material for Cement Buildings or Stucco Exteriors. Proof of against Dampness, Heat and Cold

In applying ordinary lumber, heavier scaffolding, more tools and greater scaffold floor space are required. In applying Bishopric Sheathing, one man drives a few nails in each sheet; a common laborer or boy can finish the nailing.

Bishopric Sheathing insures comfort during the construction of the building. As soon as the building is closed in with Bishopric Sheathing, the men may work in comfort on the inside during bad weather, finishing the outside on suitable days. This insures continuous work, without loss of time, enabling the contractor to hold his men and complete the work in the least possible time.

Bishopric Sheathing is used with equally splendid results under flooring and as a substitute for roofing boards. Used under floors, it serves as a sound deadener and keeps out dampness; used under the shingles, it keeps out cold and summer heat.

PAYS MANY USES—Bishopric Sheathing also is used with excellent results as a lining for dairy barns, ranch houses, poultry houses, drying sheds, or any out-door building where protection from the elements, Summer or Winter is desired.

Bishopric Sheathing is the ideal material for cement exterior or stucco work. Cement firmly adheres to the laths and Asphalt Mastic and makes a solid, smooth exterior. For factory or residence this form of concrete or stucco construction is the cheapest and best known.

PRICE OF SHEATHING AND SHIPMENT—Crate of 16 sheets covering 256 square feet of surface, $6, or $2.35 per square of 100 square feet, f. o. b. New Orleans, La., Cincinnati, or Alma, Mich. We ship from nearest point.

BISHOPRIC ROOFING SELF-PROTECTING

The materials used in Bishopric Roofing are anti-protecting. Other roofings require protection in the way of paint or coatings to prevent drying out, cracking or rotting. Bishopric Roofing requires no paint. The Mastic is toughened and perpetuated by an exclusive process. Carbonate of Lime is mixed with pure asphalt, making an impervious mixture which stands a pressure of 300 pounds to the square inch. This is a negative process—durable Exposure of Asphalt Mastic may be exposed direct to the weather in any climate without danger of softening, drying out, cracking or crumbling. Write for free samples and literature.

Ideal home showing Weather boards, over Bishopric Sheathing, lath side exposed, also Bishopric Roofing over Bishopric Sheathing

Write for Descriptive Booklet and Samples—at Sent FREE. Dealers Write for Proposition.

THE MASTIC WALL BOARD AND ROOFING MFG. CO., E. Third St. Cincinnati, 0.
Knives
That Stand The Strain

Keen Kutter pocketknives keep their edges longer than most ordinary knives, because every blade is made from the finest tool steel—made right and tempered right. Cut with the grain or against it, hard wood or soft, and a Keen Kutter stays at its work and does it well. A little strain sometimes snaps the blade of an ordinary knife and the break always comes in a soft or brittle spot. Keen Kutter knives are evenly tempered—all blades. They don’t chip, bend or curl.

Knives have earned the reputation they have with thousands of skilled artisans who know and insist upon quality cutlery at its best. Do not accept any “just as good” knife—it isn’t. The Keen Kutter trade mark guarantees long life and long wear. If any Keen Kutter tool doesn’t live up to the guarantee back of it, you can trade it for the price you pay for it—any time.

“The Recollection of Quality Remains Long After the Price is Forgotten.”
Trade Mark Registered.

If not at your dealer’s, write us.

SIMMONS HARDWARE COMPANY (Inc.)
St. Louis and New York, U. S. A.
WE INITIATE - NEVER IMITATE

Time-Savers

50%

of the time required to hang a door can be saved by using "NATIONAL" ornamental Butts. Some contractors say they can save more. Figure up the time spent in a year in hanging doors and you will see how much it is to your advantage to use them.

Another exclusive feature—the new false tip is threaded and screws into the butt. The slot is for a screwdriver, making it easy to remove the pin. Also shows which is the bottom of the butt.

STYLE No. 400B

here illustrated can be furnished in any finish and in all sizes from 1 1/2-inch to 4 1/2-inches inclusive.

Ask for Booklet Ornamental Ideas and give us your dealer's name.

Directions—Attach butt part "A" to jamb first, then set and wedge door into position and attach Ornamental Leaf to surface of the door. Simple, isn't it?

Be sure to look for the flag—it's stamped on all "National" Butts—It stands for quality.

National Manufacturing Co. STERLING, ILL.