

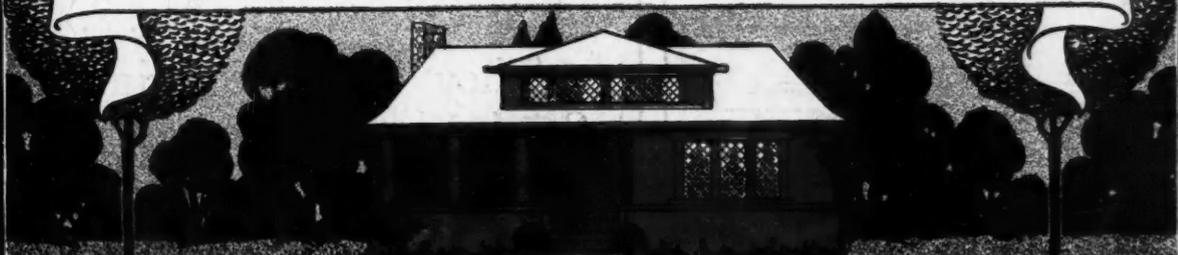
AMERICAN CARPENTER AND BUILDER



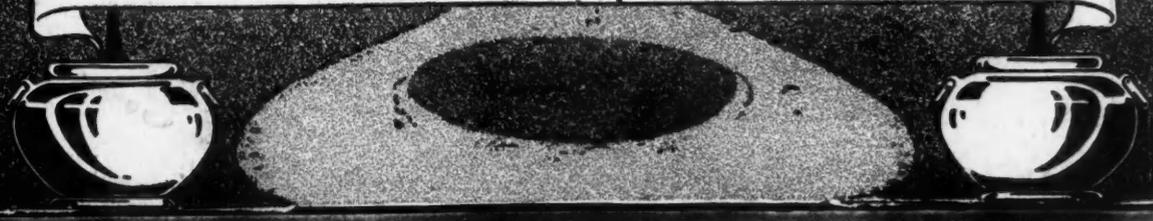
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1909
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PHILADELPHIA, PA.

THE WORLD'S GREATEST BUILDING PAPER

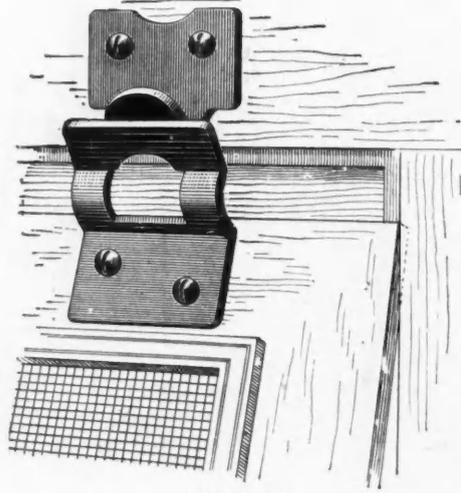
BUNGALOW COMPETITION



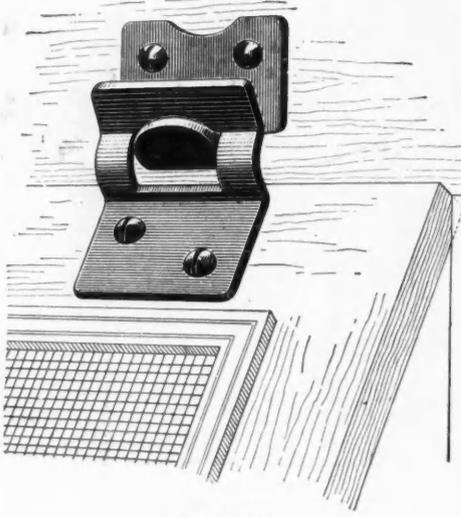
PRIZE WINNING DESIGNS



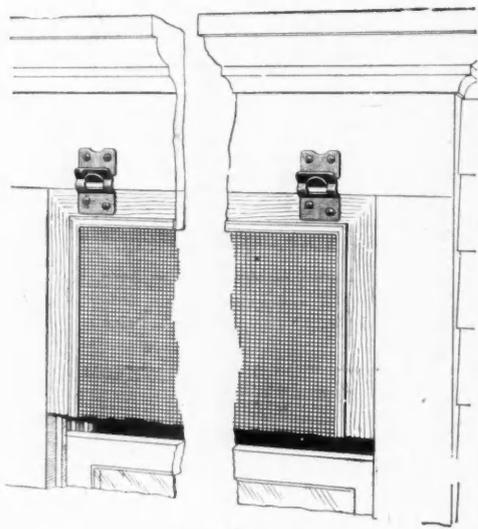
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A25



1st Position



2nd Position



3rd Position

WE INITIATE—NEVER IMITATE

AUTOMATIC SCREEN AND STORM SASH HANGERS

HERE it is at last! A Practical Screen and Storm Sash Hanger.

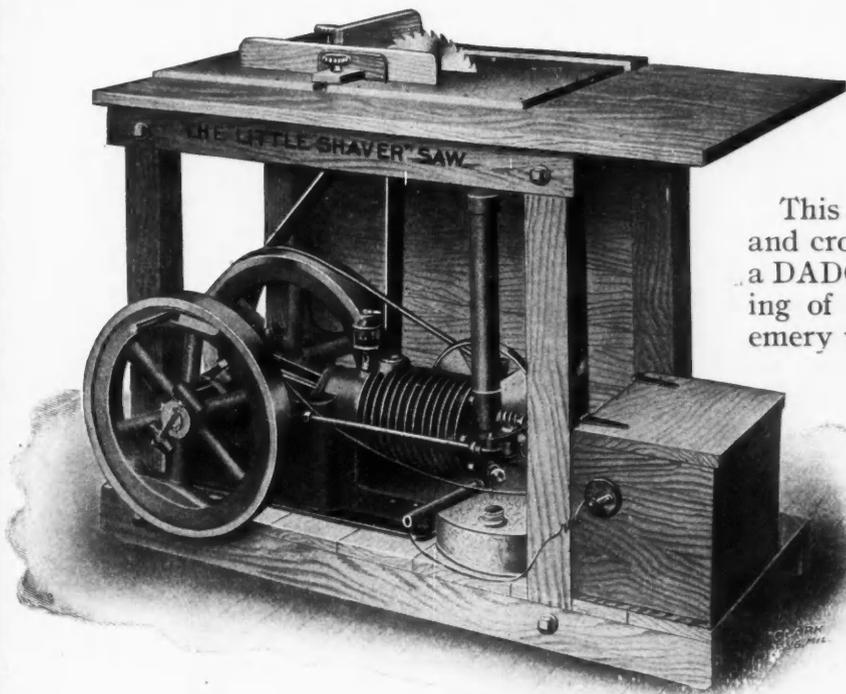
It is so constructed that it holds sash or screen firmly in position and prevents rattling.

When rehanging screens or storm sash let top rest against blind stop inside of casing. (Illustration No. 1.) Slide up and Hanger will latch over hook automatically. (Illustration No. 2.)

They are sure "winners." Send 15 cents in stamps for sample set with screws, mailed postpaid with full directions for hanging.

National Mfg. Co.

Sterling - - - Illinois



Do Your Own MILLWORK

This portable saw rig will rip and cross-cut 2½-inch lumber, has a DADO head which will do plowing of window and door frames, emery wheel for sharpening tools, strong 3-horsepower water-cooled engine, iron table fitted with gauges, the entire outfit strongly built, ready to start when it reaches you. Can be moved from job to job, total weight 615 pounds.

THE "Little Shaver" Floor Scraper

has all the weight on the blade and not on the handle, as in other scrapers. Nothing but a large hand scraper. A boy can do the scraping. Simplest and most satisfactory machine to work on the market.



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The American Floor Surfacing Machine

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

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

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

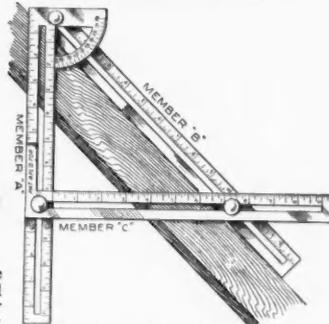
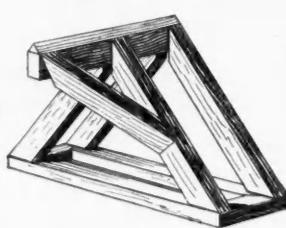
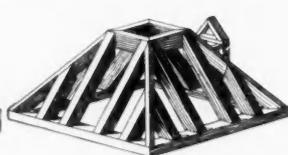
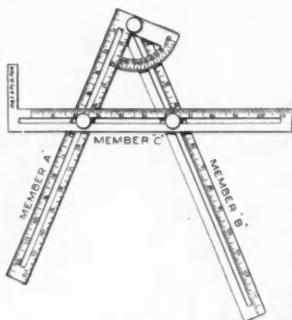
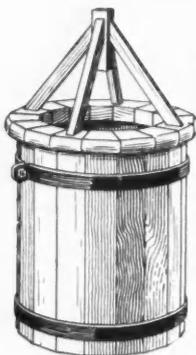
It has surfaced and polished millions of square feet of the finest floors in America and Europe.

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

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

Manufactured by

The American Floor Surfacing Machine Company
TOLEDO, OHIO



United States Engineer Office

508 Federal Building,
Chicago, Ill., March 8, 1909.

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Gentlemen:—I have examined the A-B-C Protractor Square manufactured by you, and take pleasure in saying that it is a good practical appliance, and I believe it to be a valuable tool for carpenters, builders and others. It will save much time and labor

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SEE THAT NAIL

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

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In these days of close competition need the best possible equipment, and this they can have in

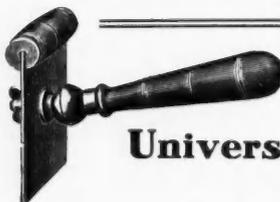
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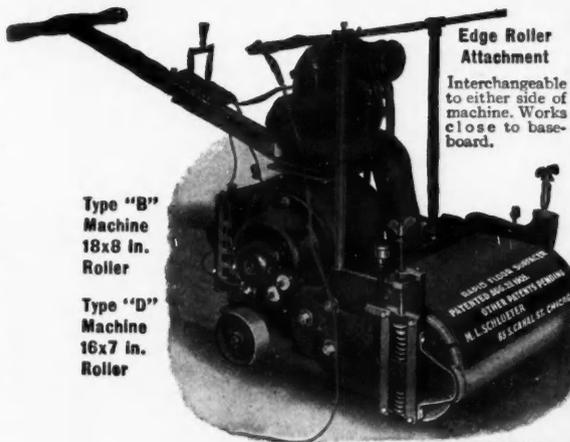
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Built on the only correct principle. Guaranteed to be **THE BEST** machine with which to produce an even, smooth surface on any kind of wood floor old or new, hard or soft, and in all buildings: Residences, Stores, Factories, Bowling Alleys, Roller Skating Rinks, Reception and Dance Halls, etc. **THE SCHLUETER** will remove all joints or warped edges, and leave the floor perfectly smooth. Will remove shellac, varnish, oil, wax, lime stains or the "muck" from skate wheels in a most satisfactory manner.

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EASY TO OPERATE. NO DUST. Over 500 contractors are now using our Machines. Made in two sizes. We will surface your floor. Mail us size of floor, new or old, and kind of electric power. **In eight hours will sandpaper 4,000 to 5,000 sq. ft. once over.** Write for new prices, catalogue and our **FREE TRIAL** proposition.

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The **SCHLUETER RAPID FLOOR SURFACER** is so constructed that a roller, to which a sheet of sandpaper is quickly adjusted, is brought in contact with the floor surface while revolving at a speed of **600 revolutions a minute.** It is guaranteed to do the work cheaper and smoother than any other machine or method. This machine will surface from one to two thousand square feet in eight hours. Cost of sandpaper and electric power from \$1.00 to \$2.00 per day

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Type "B" Machine 18x8 in. Roller

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The natural result of laying a **MONTROSS METAL SHINGLE ROOF** Handsome, fireproof, durable. Always pleases the customer. Laid with hammer and nails; no soldering. Catalog!



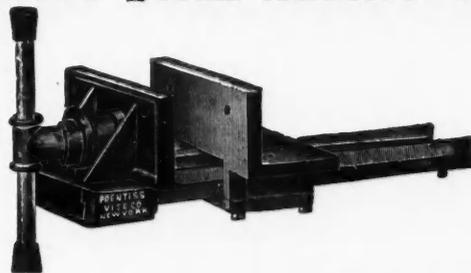
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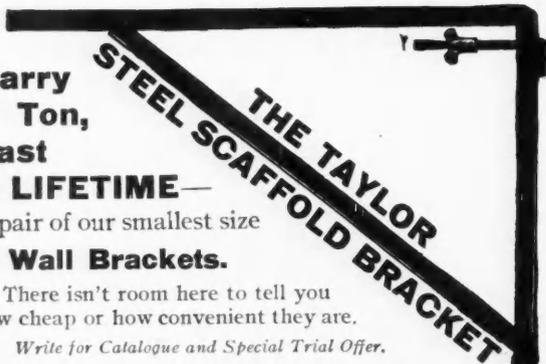


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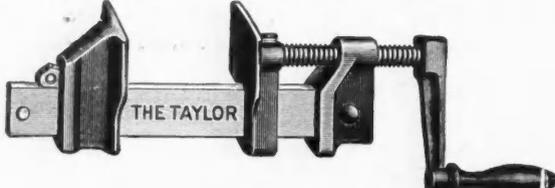
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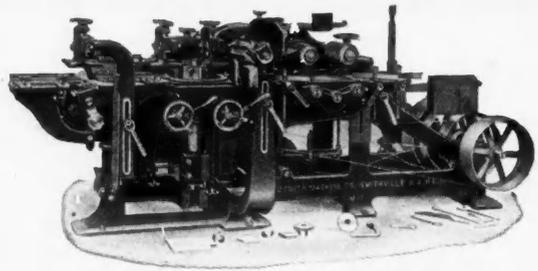


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A pair of our smallest size
Wall Brackets.
There isn't room here to tell you
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**ARE YOUR CLAMPS
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Do you know about our improved gripping device?
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Our Clamps are warranted unbreakable in use.
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The cut shows our **No. 105-A 12-in.
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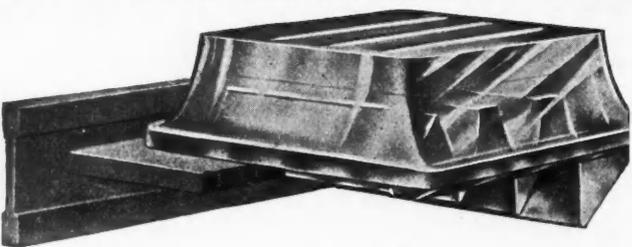


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Adjustable Floor Scraper

B EING Manufacturers of Fine Flooring, we have for years been interested in perfecting a Floor Scraper that would do high grade, fast work on all kinds of hardwood floors. We now have such a machine ready for your use and inspection.

A trial will conclusively prove to you that the JOHNSON Adjustable Floor Scraper is today the only Scraper that does *rapid* work and *good* work at one and the same time.

That is because it is built on the *right* Mechanical Principle.

Not only can an ordinary man using the JOHNSON do the work of five men, but when the job is finished it is done just as well as it could be done by hand with a Smoothing Plane.

The JOHNSON Floor Scraper leaves no waves, because the *blade*, being instantly *adjustable* by the lever on the handle, (see illustration) goes *with* the grain all the time.

All you have to do is press a lever to shift the knife just at the moment it *needs* shifting from an upright to a horizontal position, or to any intermediate angle. Thus you get the proper Shearing Cut at all times. No waves or uneven spots. The JOHNSON means *high class*, as well as *rapid* work. It does equally fine work on any kind of wood—oak, hard maple, pine, beech, birch, etc. No getting down on knees to adjust the Blade and no getting out of fix.

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Blade is Instantly Adjustable The JOHNSON Does the Work of Five Men and Does It RIGHT

When you consider the fact that with the JOHNSON a man can cover 125 sq. ft. of floor per hour and do it *right*, you must realize that it is a great money-making device. The thousands of practical workmen who are using it say it is the *one* Scraper built on the correct Mechanical Principle.

We want you to use and try the JOHNSON and see it *in action*. We want you to compare it to *hand methods* and to all other Floor Scraping Devices to be had. This Test will cost you nothing whatever, unless you decide that the JOHNSON Floor Scraper is all we claim for it in every particular.

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Write now—today—for Free Information and Prices on the JOHNSON Floor Scraper Complete, including full set of Knives, Sharpeners and everything necessary to keep the machine in perfect order. Send in your name at once and have us arrange to ship you the JOHNSON Floor Scraper for you to try Free—Address us,

**S. C. JOHNSON
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"The Wood Finishing
Authorities"

**Racine
Wis.**

THE ONLY Floor Scraper Built On the Correct Mechanical Principle



ACKERMANN'S "MAKE GOOD" OFFER

"More Work, Easier Work, Better Work than any Other Floor Scraper Made or the Entire Outfit is Free"

You run no risk in ordering Ackermann's Rapid Floor Scraper sent on Free Trial. You don't have to pay a dollar down, not even the express charges.

Besides this you receive free with the machine, a complete Ackermann Knife Sharpening Outfit which insures the successful use of the machine by even an amateur. This knife sharpener practically works automatically and will put an absolutely perfect edge on the knife blade in less than two minutes without removing the blade from the machine.

Ackermann's New Knife Sharpener works perfectly on the blade of any floor scraper. It cures all "Knife Troubles."

Real success in the use of any floor scraper depends largely upon the cutting edge maintained on the knife blade that actually does the work. No machine will do the work well unless the blade is kept constantly sharp. Up to the present time the average operator of any floor scraper made, has had much trouble in doing good work, quick, because sharpening the blades was very difficult.

Send for Booklet and Information.

Great Free Trial Offer

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Machine in position, ready to Sharpen Blade

Arrows point to the Knife Sharpening outfit which fits compactly into machine, out of the way. Knife sharpener sold separately if desired. Price, \$5.00.



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Our screens have waterproof coped joints and the frames are weather proofed before the finishing coats are applied.

Best grades of Wire Cloth, enameled, galvanized, genuine bronze, fastened by the most approved methods.

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Special terms to Contractors and Builders.

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If you need anything in my line and wish to

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A Wonderful Machine FOR THE Carpenter and Builder

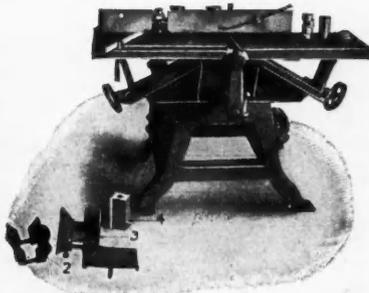


Universal Wood Worker, fitted out with Band Saw, Mortising Attachment, Shaper and Jointer.

We give an ironclad guarantee with every machine that they must be exactly as represented and described in catalogue and folder. If they are not as we represent, we will give the purchaser the opportunity of returning them to us, and we will refund his money, paying all freight charges. Every attachment is guaranteed to work perfectly on the Universal Wood Worker. Seventy-five per cent of our Universal Wood Workers, which we have sold within the last eight months, have gone to the contractor and builder. A great number of them have discarded their Universal wood workers of other makes. **WHY?** There must be a reason for this, as a contractor would not discard a machine that was giving him perfect satisfaction. **ANSWER:** Because our **FAMOUS** Universal Wood Worker is the only practical woodworking machine on the market today for the contractor and builder. It will save him from 10 to 20 per cent in getting out his work, over and above any other make universal wood worker on the market. It is so compact, taking up the least possible room, and can be placed in a small shop, being operated by very little power, which will enable a great many contractors to place this machine, where it would not have been possible for them to put an entire outfit of woodworking machines in their shops if they were compelled to buy the single tools. Our catalogue "B" is furnished free, explaining thoroughly the workings of this **FAMOUS** machine, which consists of a jointer, shaper, band saw, saw table, boring machine, mortising machine, single end tenoner, pony planer, drum and disc sander and emery grinder, all combined in one tool. It can also be arranged for sash sticking, molding and matching.



Universal Wood Worker, equipped with our Planing Attachment, will plane up to 4 in. thick and 10 in. wide; also arranged for doing two side molding, matching and sticking.



Universal Wood Worker, fitted out with Jointer, Shaper and Two Side Molder.



Universal Wood Worker, fitted out with the Single End Tenoning Attachment, with traveling table and hold down lever.

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Do your own mill work. Let us tell you how good and cheap we can fit you out with machinery to do your work. Large stock of **New** and **Second-Hand Woodworking Machines** to select from. Catalog and Monthly Stock List Mailed on request.

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FAR AHEAD for Smooth, easy work and holding edge will be YOUR VERDICT ON TRYING

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

We'll gladly send you this booklet with our compliments, promptly upon receipt of your request.

Tower & Lyon Company, 95 Chambers Street, New York

ONLY PERFECT FLOOR SURFACING MACHINE

Will do perfect job on any kind
of floor, whether even or uneven.

A Boy Can Operate It

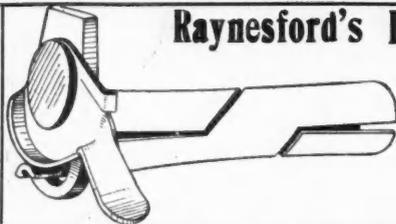
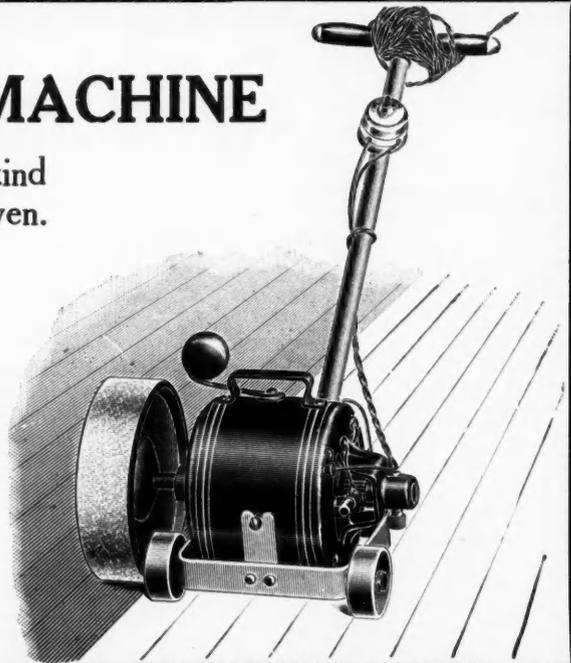
Sold on absolute guarantee. Price complete
with motor switch and 50 feet electric cord
ready to connect to light socket, \$125.00

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Raynesford's Improved Bench Stop

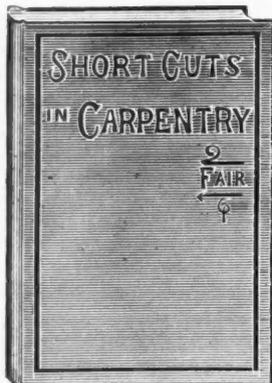
will hold any thickness of work equally
well from $\frac{1}{4}$ inch up to 2 inches and hold
it firmly. Can be operated more quickly
than the wooden plug you are used to.
Does not stick out to get broken off, to
hurt you, or tear your clothes.

Try one and be convinced.
Write for circular or sent Post
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RAYNESFORD & SONS, Ellis, Kan.



Raynesford's Improved Bench Stop at Work



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A COLLECTION OF NEW AND IMPROVED METHODS OF LAYING OUT
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By ALBERT FAIR

TO LAY OUT and erect carpenters' work accurately and quickly is an accomplishment desired by all progressive carpenters. In this book, not only the simple rules for the short cut are given, but also the "reason why," so that the carpenter can apply his knowledge to many problems besides those given in this book.

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This useful, practical and unique instruction book contains remarks about the carpenter and his work; the difference between carpenters and joiners. Description of the various carpenter and joiners' work about a house illustrated with a large folding plate giving the names of the various parts of doors, windows, trim, etc. (This chart alone is worth the price of the book.) The practical use of geometry in laying out carpenters' work explained in a different way so the reader will know "why." How to obtain various miters, both for straight and curved work. How to make a miter box. Descriptions of different kinds of moldings. Bending moldings around circles and the art of kerfing explained simply and accurately, telling why it is done and how to do it. Rake moldings and how to lay them out fully explained, and several short-cut ways of doing it. How to find the corner brackets for coves. The use of the steel square in finding various pitches, degrees, miter cuts for polygons, etc. Use of the 2-foot rule in describing various figures when no other tool is at hand. The selection and use of glue. Hints on saving time when working on hardwood. The art of blind nailing. Setting door jambs, fitting and hanging doors. Fitting windows. How to cut pockets in window frames. Remarks on framing. Short cuts in placing siding. Siding a circular tower. Shingles required to cover a given roof area. Laying out octagon shingles. Quick method in finding level of shingles for gable. Framing a floor with short timbers. Building up a beam. Laying floors. Laying wood carpet. Constructing dish floors. The art of veneering on a small scale. Hints on inlaying. Roof framing explained on a new principle whereby you know the reason why the square is used and how to use it for different forms of roofs. How to find the sizes and cuts of braces. Bevels for hoppers. Making wheat bins. Quick method for beveling fence posts. Shaping a flag pole. Quick method of obtaining the bevel of tank staves. Making and placing well curbs, etc., etc.

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**BACKWARD
MOVEMENT**

The WEBER ^{DOUBLE ACTING} Floor Scraper

The WEBER is the Only Floor Scraper having Two Knives -- One on Each Side.

Do you catch the meaning of that—The Weber is **DOUBLE ACTING!** It can be used both forward and backward—pull or push—and for doing two kinds of work at once without readjustment. It can have a curved knife on one side for scraping and a straight knife on the other side for finishing—thus preventing waves in a floor. By means of its adjustable blade holders, the knives can be set and be ready for instant use at any angle—an absolute necessity for perfect work. It will allow of the exact adjustment for cutting with or against the grain or for use on any kind of wood. It has an automatic sharpening device by which the blades can be sharpened, either curved or straight, without removing them from machine.

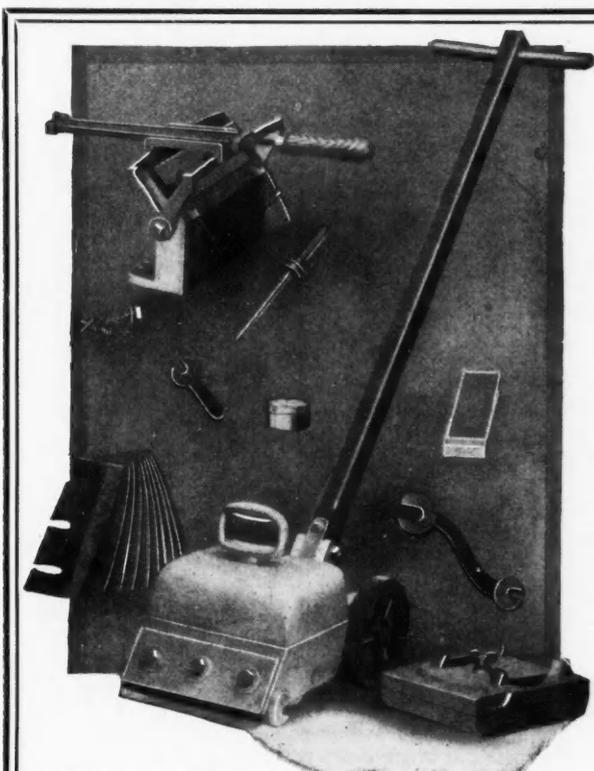
The Weber weighs 108 lbs. and is perfectly balanced; this, together with its flexible frame, makes it cut smooth and easy. If your dealer cannot supply you, write for price list on my ten different machines and ask me about my **TRIAL OFFER.** Send me your dealer's name and I will tell you the whole story. Write me on your letterhead.



**THE WEBER
AUTOMATIC
SHARPENING
DEVICE**

enables the operator to sharpen a blade without removing it from the machine. The blade can't be sharpened at wrong angle—so simple a child can use it.

JOHN F. WEBER, PRESIDENT, WEBER MFG. CO. 670 71st AVENUE WEST ALLIS, WIS.



The Acme Floor Scraping Outfit consists of the Floor Scraper, Blade Sharpener, Sander, One Dozen Blades, File, Gauge, Oil Stone, Two Wrenches, Two Bolts, Burnisher and Box of Tallow

**The SAFEST
and SUREST**

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I could fill up this book in telling you all about the superiority of the ACME FLOOR SCRAPING OUTFIT over all other similar machines, but that will not convince you. You want to be shown. You want to see for yourself. That's the proper system.

Let us get together. I offer to send the ACME FLOOR SCRAPING OUTFIT to you on ONE WEEK'S FREE TRIAL. You can work with the scraper, use the Blade Sharpener and Sander as much as you please, and if at the end of the week the outfit does not meet with your entire approval, send it back at my expense.

Does this sound fair to you? Will you investigate? Remember I assume all responsibility. Write to me today and I will send you Booklet and other information regarding my machines.

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THE ADJUSTABLE FLOOR SCRAPER

- (1) **HANDLE** adjustable to tall or short man.
- (2) **WEIGHT** over blade adjustable as desired. 15 to 50 lbs.
- (3) **VERTICAL** angle of blade to floor adjustable.
- (4) **LATERAL** (shear cut) angle of blade on floor adjustable.

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Floor Scraper Dept.

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OUR HAMMERS are perfectly balanced and are provided with **Leather Handles** to prevent hand from slipping

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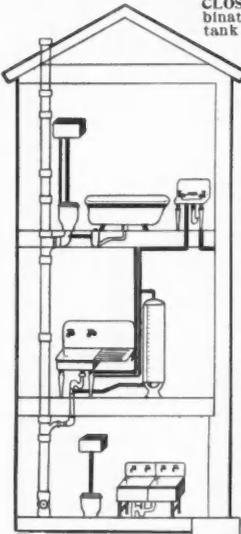
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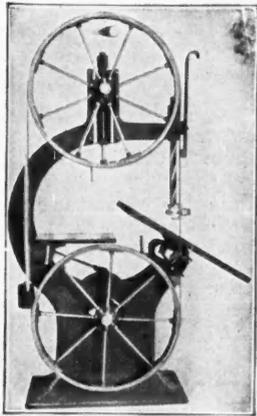


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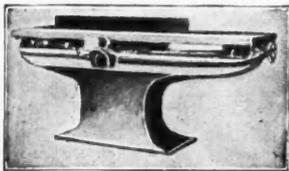
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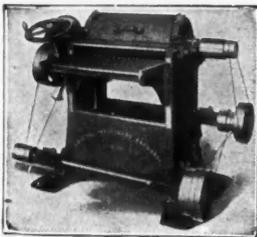
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27, 32 and 36-in.



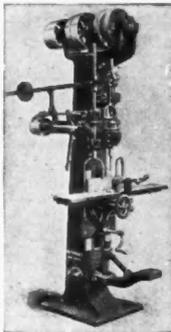
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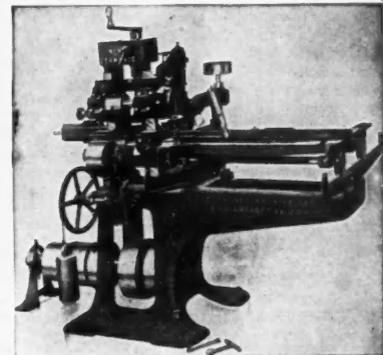
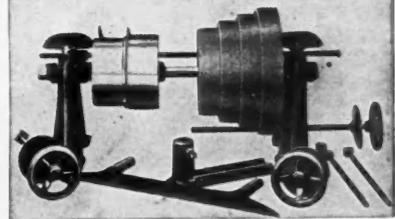
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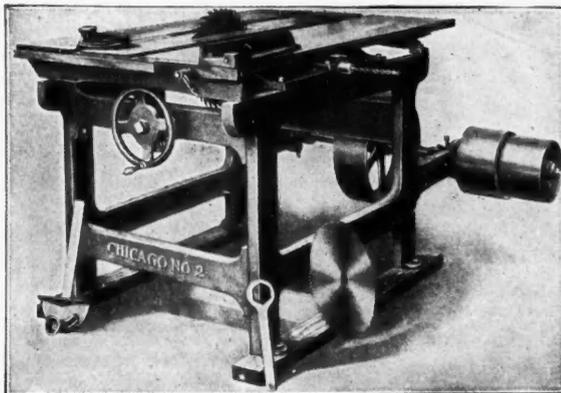
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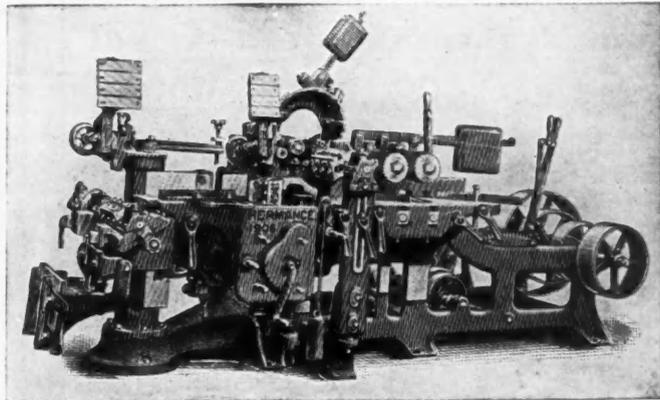
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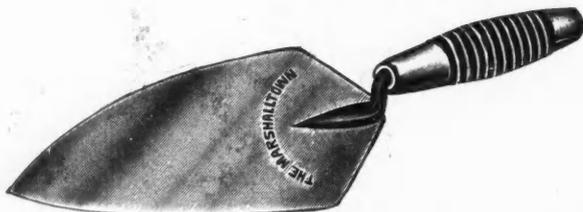
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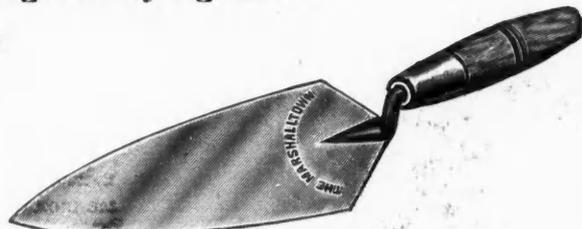
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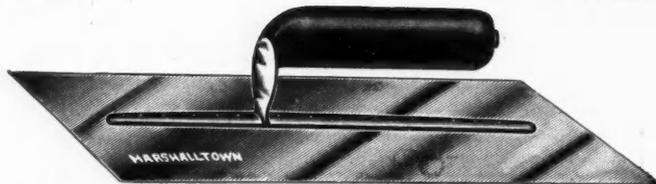
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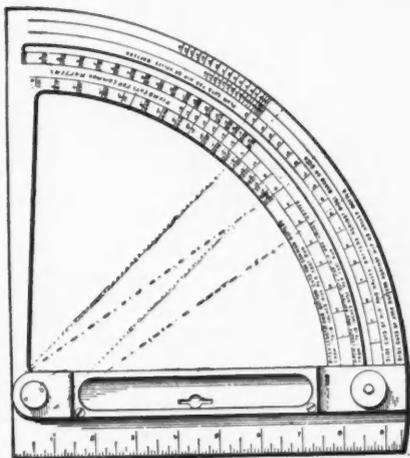
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We are Akin to the Gods

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We are Akin to the Ox



THE CALHOON Rafter and Polygon Bevel

Every bevel in the universe is contained in a quadrant; pass a line through it, from the center of the square to any degree or pitch, register on it the length (per foot run) and the opposite blades of the square will automatically (from that line) give bevels desired. See?

All calculations are based on 12 inches the unit of *base run* and 24 inches the unit of *pitch or rise*, and all hip, valley, octagon and jack, or cripple rafters on run and rise of principal or common rafter. We all know how difficult it is to read and apply the square. This tool will help you do both, or, rather, do both for you, as it is a practical tool.

The relative use of this tool in a carpenter's hands is that of an X-Ray machine to the surgeon, or of an interest book to a banker, or the computing scale or cash register to the merchant.

It is an organization of draft-board, square, tri-square, bevel-square, plumb, level and bevel-protractor into one tool.

This is a substantial TOOL 9½—10½. Made of Nickered Steel.

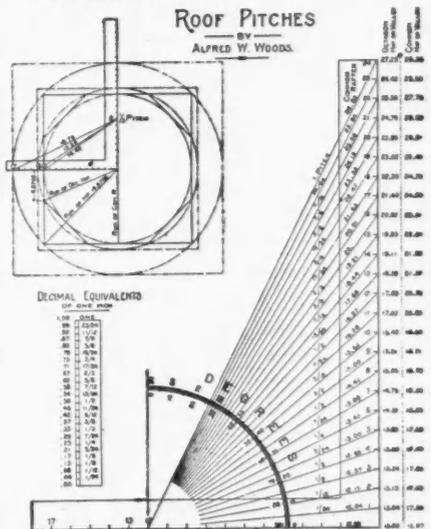
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THREE SIZES ONLY
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Price Postpaid 15 cents each

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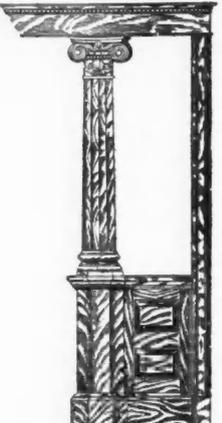
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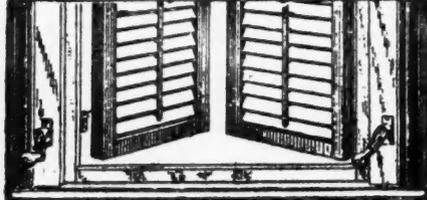
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Illustration at right shows half-section of Column design No. 552.



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 CHRISTENSON BROS., Props. 1452 Milwaukee Ave., Chicago

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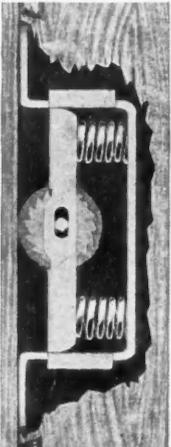
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Prevent rattling and permit the window to be moved up and down with ease. Hold it safely at any point desired.

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Get our Tool Book full of new ideas in reliable time and labor saving tools for all classes of mechanics. Illustrated with photographic reproductions of the tools in use. It's worth having. FREE to mechanics who mention the "American Carpenter and Builder."

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All hardware dealers sell "Yankee" Tools
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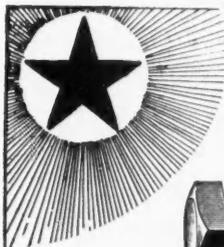
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Convenience!

The lately improved springs and corrugated steel rods put the "PHOENIX" far in lead of less improved styles. Write for Catalogue "C" and free samples, showing construction.

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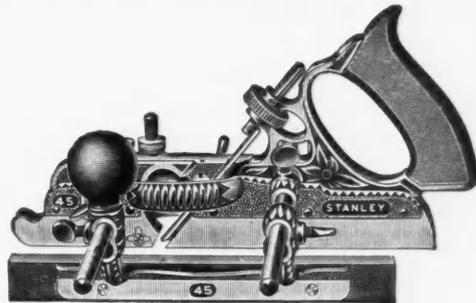


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This Plane embraces (1) Beading and Center Beading Plane; (2) Rabbet and Filletster; (3) Dado; (4) Plow; (5) Matching Plane; (6) Sash Plane; and (7) a Superior Slitting Plane

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A Civil Engineer that you may have with you at all times. The most practical, durable and convenient instrument of the day. The longitudinal recess which is shown in cut is well worth the low price of the instrument.

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

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See December number of this paper pages 261, 320 and 322 for facts. No plane like it. Inexperienced man can use it. A child can set it. It sets itself. THE BEST ALWAYS THE CHEAPEST.

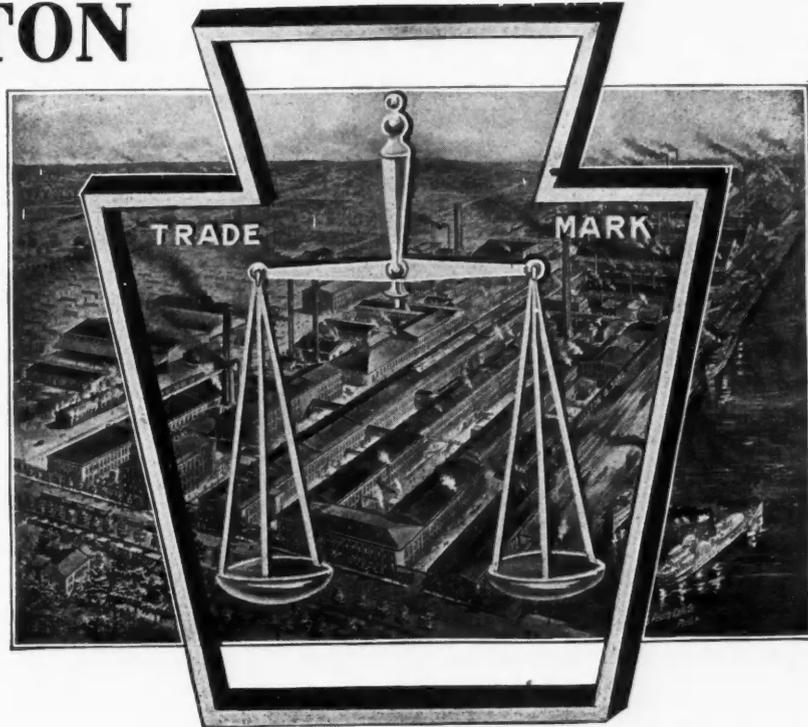
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Have you ever used a straight-edge level? If not, you should use Henderson's. For running levels, in fireproof buildings, setting frames, plumbing partitions and leveling up foundations in frame buildings, these levels are the best.

The simplicity of adjustment is the main feature of these levels; they can be removed and replaced as often as desired with only the first adjustment, and it will not throw them out of true, making it the most convenient tool of its kind in use.

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SASH LOCKS



Bronze Plated, per Doz. \$0.55
Antique Copper, " " .55

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Mr. Contractor and Material Man:

We want you to have our Builders' Hardware Catalogue and Net Price List.

DON'T WAIT

Send us a postal by return mail.

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

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"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.

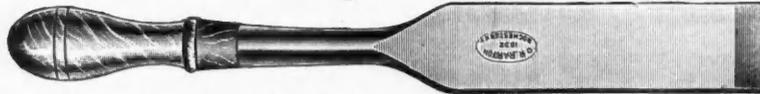
We can offer something special in the matter of price on sets packed in a sensible box. Send today for particulars and catalog.

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The Celebrated Barton Planes and Edge Tools for carpenters and all other woodworkers are unequaled by any other make for keen hard, smooth cutting edges. If your hardware dealer does not handle **The Celebrated Barton Tools**, send direct for Catalog. Be sure and specify "CARPENTER'S CATALOG" **MACK & CO., 20 Brown's Race, Rochester, N. Y.**

MILLER'S TOOLS

Miller's Lock Mortiser

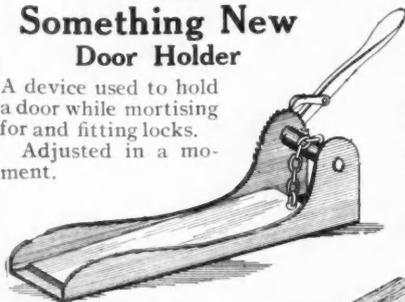
This tool is a profitable investment for any builder.

Cuts an opening for a lock in three minutes. Its merits have been demonstrated in all kinds of hard or soft woods. It will save its cost in a day.

Sent on Trial

Something New Door Holder

A device used to hold a door while mortising for and fitting locks. Adjusted in a moment.



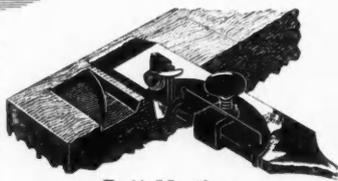
Does not mar the door or floor. Can be used for other purposes.

A tool that every carpenter should have. Send for one.

Price \$1.25

We have sold thousands of these handy little attachments, and our files are full of letters of praise and commendation.

It cuts the seats for butt hinges in doors, jambs and similar work. Does it neatly and accurately, and in one-third the time; adjusted in a moment. Every mechanic that wishes to be up to date should get one. Price 75 cents, including our rule gauge. If your dealer does not have them send us money order for the amount and we will send postpaid.



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GOSSETT HINGES

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

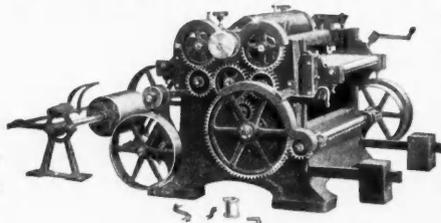
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Box 523
BEATRICE - NEBRASKA

CRESCENT WOOD WORKING MACHINERY

Better than some that may be offered you at a higher price

- Band Saws,
- Saw Tables,
- Jointers,
- Shapers,
- Borer,

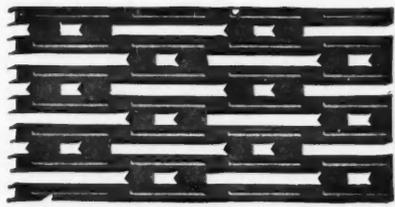


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Sagging between the studding is rendered absolutely impossible if Clincher Lath is used. Read what progressive carpenters have to say about it.

Easier to handle and easier to erect than any other lath on the market. Prove this by sending to Department R. C. for samples. Free to anybody interested.

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OHIO



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

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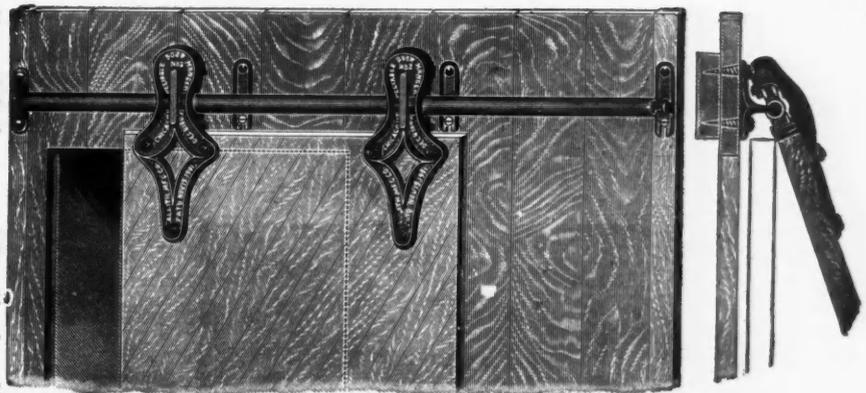
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MINNEAPOLIS :: :: MINN.

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Impossible to Derail
Easy Running, Great Strength

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BARN, WAREHOUSE and FIRE DOORS
Send for Catalog "A"

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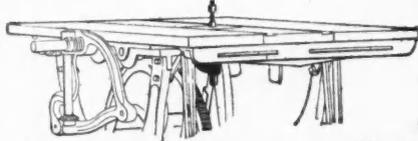


One Man with the No. 5 Union Combination Self-Feed Rip and Cross-Cut Saw

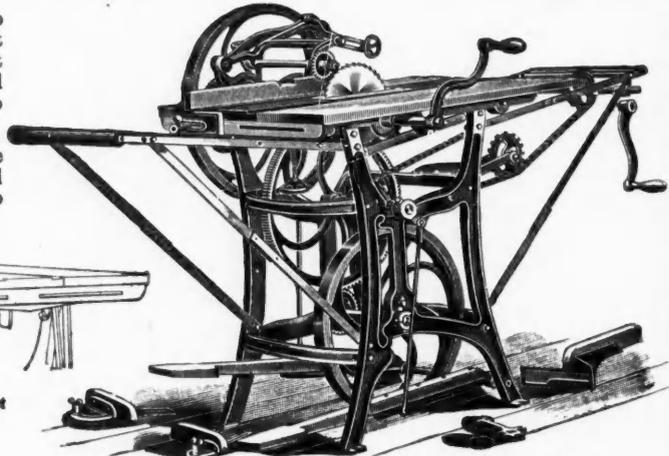
can do the work of four men using hand tools, can do it with ease, can do it better. Consider the amount saved—three men's wages—and compare with the cost of the "Union" saw. In a short time the machine will pay for itself and then the wages saved will go into your pocket.

EVERY MACHINE is carefully tested before leaving factory. We guarantee entire satisfaction and machine may be returned at our expense if, after two week's trial, you prefer your money back.

SUITABLE FOR various kinds of work—ripping, (up to 3½ inches thick), cross-cutting, mitering, etc., and with additional attachments rabbeting, grooving, dadoing, boring, scroll-sawing, edge-moulding, beading, etc., almost a complete workshop in one machine.



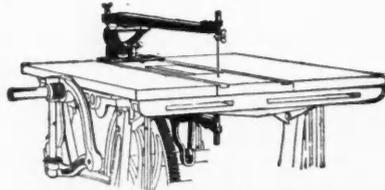
"Union" Moulding Attachment



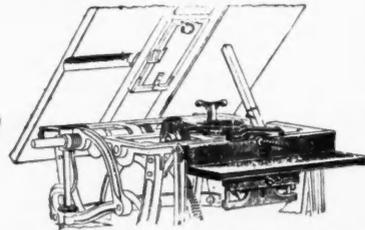
No. 5 "Union" Combination Self-Feed Rip and Cross-Cut Saw.

Ask for Catalogue "A," fully describing our complete line of wood working machinery.

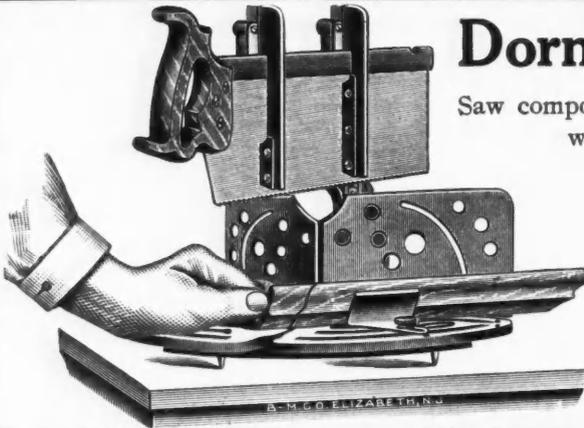
The Seneca Falls Mfg. Co.,
218 Water St.,
Seneca Falls, N. Y., U. S. A.



"Union" Scroll-Saw Attachment.



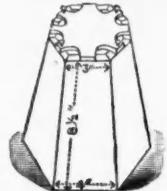
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Saw compound as well as plain mitres any width with a back saw 4 inches wide.

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SEDGWICK MACHINE WORKS
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SEE SWEET'S INDEX

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ADJUSTABLE HANGER**

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

Ask your hardware dealer or write for free sample and catalog.

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CO.
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Don't Ask the Dealer for Sash Cord. Ask for
"SILVER LAKE"
and see that he gives it to you. It is impossible to



substitute, as our name is stamped in red on the cord. Silver Lake Sash Cord is the Original Solid Braided Cotton Sash Cord and has been the standard since 1868. No other is just as good.

**MONITOR
SASH LOCKS**



(PATENTED)

NEVER BREAK

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

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

MADE IN TWO SIZES AND ALL FINISHES BY

**The Champion Safety Lock Co.
Geneva, Ohio**

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All-Steel Sash Pulleys**

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

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

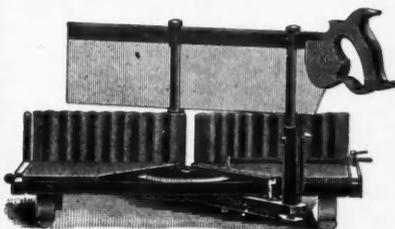
Write for catalogue and free samples and prices on gross, barrel, or any quantity.

Direct from the makers to you. Inquiries welcome.



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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 "Q."

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Fine Hand Made Hand Saws

The Purest of Quality Our
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IN introducing our "GREYHOUND" brand of Saws to the trade, we have departed from our usual custom in naming the saw. This saw will be known as our "GREYHOUND" and will be the only Bishop brand of saw known by name.

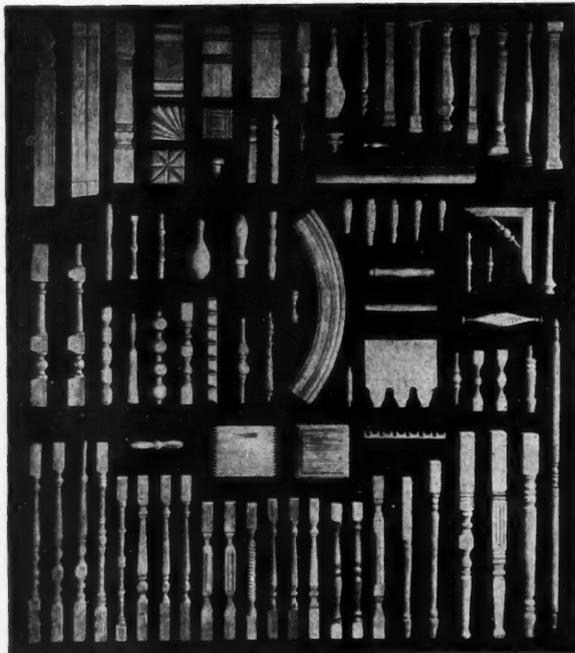


We have had a Chemist experimenting for years to originate a purity of steel with a fine grain and tough body that would stand up under such a fearless warranty as we place on our "GREYHOUND" brand of saws. We now have it. We know its worth as well as its value. As workers of steel we understand it.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

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

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

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



**MADE ON OUR
Universal Turning and Variety Machine**

It is the wide range of its work that makes this machine, wherever sold, one of the busiest and most profitable in the shop. It will quickly pay for itself in making balusters and other turnings at a big saving in cost, and as a general handy machine its variety feature gives it a value that only use can thoroughly demonstrate.

May we show you, without obligation on your part? Then we have a proposition to submit—when you are ready.

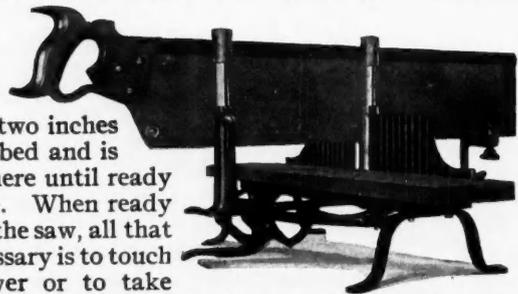
C. MATTISON MACHINE WORKS,
879 FIFTH STREET, БЕЛОИТ, WIS.

THE TRUE MITER BOX

Cut shows saw raised

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

This miter box is so constructed that any piece broken or stolen can easily be replaced
NICHOLLS MFG. CO., OTTUMWA, IOWA



Ball-Bearing Spring Hinges.

THAT ARE PRACTICAL

The Shelby Chief Double Acting Floor Hinge has solved the problem of easily get-at-able, hinges, impervious to water and dampness.

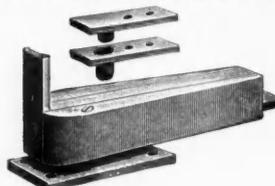
Doesn't go in the floor but rests on top. Easily applied, and very economical.

The labor saving feature is being appreciated by carpenters and builders everywhere.

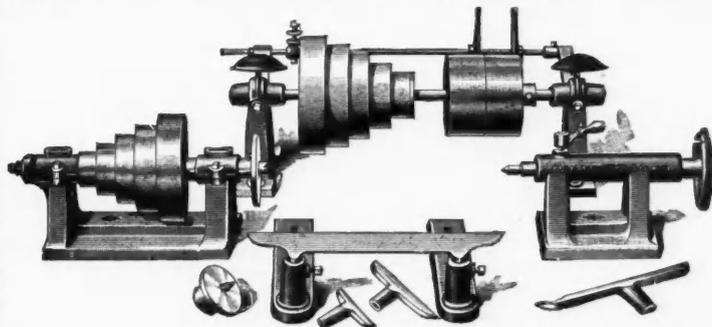
Send for our free catalog which contains some sensible hinge talk, and also shows our full line of Double Acting Ball-Bearing Spring Butts and Builders Hardware. Free on request.

Write Today.

The Shelby Spring Hinge Co.,
Shelby, Ohio



HIGH - GRADE WOOD - TURNING LATHES



Here is a Lathe that is convenient, substantial and durable, capable of the highest kind of turning at high speed. 'Tis a Lathe you will find as represented. Made in three sizes, 12, 16, 20 inch; two styles, single or double end. **Immediate shipment, any size or any style.**

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CINCINNATI - - - OHIO



This DUMB WAITER

complete ready to erect for - **\$18.50**

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

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Modern Cement Sidewalk Construction

A PRACTICAL TREATISE FOR THE WORKMAN

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Charles Palliser

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THE construction of cement sidewalks, curbs and gutters is thoroughly explained in this book full directions being given regarding the selection and testing of the cement, sand, stone, gravel, etc.; the special tools used; the laying, finishing, seasoning, coloring, etc.; together with advice on dealing with customers, and data regarding the actual cost of several jobs, with the complete specifications of each.

The methods of work have been tried over and over again by the author in his many years of experience, and always with success; and anyone following these directions will be able to lay a cement sidewalk that will last for years without rearing up, cracking or crumbling.

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enables the bracket to be used on any roof of positively any angle. The greatest preventive against danger ever been devised in this particular line. Timber cannot fall off.

The fifty thousand in use every day prove there must be superiority somewhere.

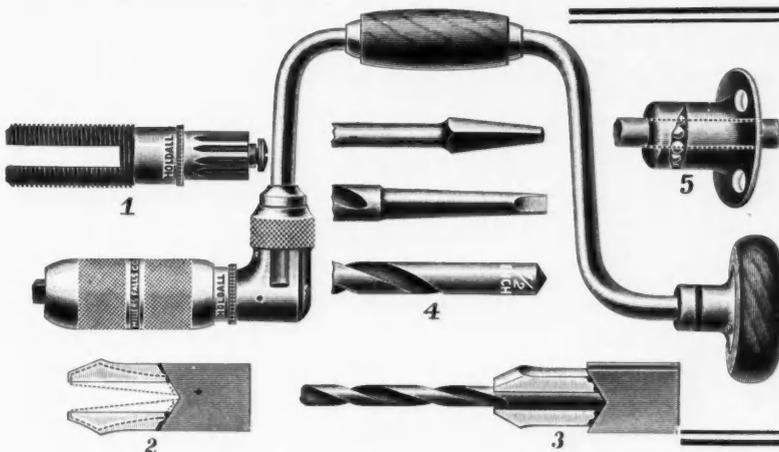
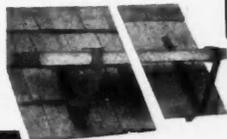
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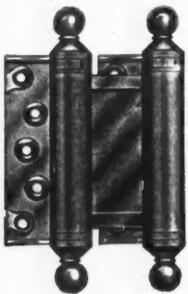
The HOLDALL BRACE

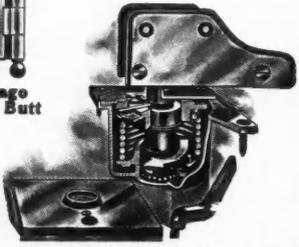
IT'S NEW and has jaws which adjust themselves to the shape of the shank. They grasp and hold securely straight, tapered, round and square shanks. The sleeve is correct in shape for comfort to the hand and to obtain the firmest grip. Every part of the Brace is made with greatest care. We say without hesitation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

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LOOK!
LISTEN!**

"Pullman" Spring Sash Balances

ASK US ABOUT THEM

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(Center Park) ROCHESTER, N. Y., U. S. A.

**FOR PEACE OF MIND,
GOOD WORK, AND A
WELL SET SAW, USE**

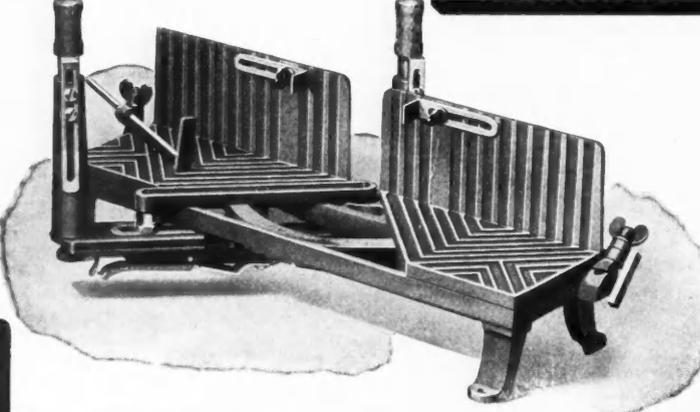
MORRILL'S NO. 11 SAWSET.



IT WILL
HELP YOU
TO DO
ALL
THREE

CHAS. MORRILL

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**"The
Nickel-plated Marsh-Ayer"**

The patent lock for fastening the swinging lever at any angle is only one of the many clever devices found on this box. Get your dealer to order one so that you may see the others. : : : :

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American Carpenter and Builder

Entered as second-class matter July 1, 1905, at the postoffice at Chicago, Ill. under the Act of Congress of March 3, 1879.

Published monthly by

American Carpenter and Builder Company
185 JACKSON BOULEVARD, CHICAGO.

VOL. VII APRIL, 1909 No. 1

The AMERICAN CARPENTER AND BUILDER is issued promptly on the first of each month. It aims to furnish the latest and the most practical and authoritative information on all matters relating to the carpentry and building trades.

Short practical letters and articles on subjects pertaining to the carpentry and building trades are requested.

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REMEMBER: not how *cheap* but how *good*.



GET acquainted with your competitor. He may not be so bad a fellow after all.



THE only dishonorable job for a good man is that of loafing—all earnest faithful work has its elements of honor.

The Prize Competition

IN ANOTHER part of this magazine will be found the four bungalow designs placed highest by the committee of judges in making their award. The winners in Class B of our double competition, the bungalows, are thus presented first—and for a number of reasons. The popularity of the bungalow continues undiminished. In fact, it has increased wonderfully since last year. Indications show that the great majority of home building this spring will be of the bungalow type. Hence it is fitting to devote a large part of our special April number to high-class bungalow designs.

The winners in Class A, of our prize competition, will be announced next month, and the four prize-winning house designs presented.

It has been the privilege of the editor, in connection with the judging of this competition, to examine and make careful study, not only of the eight prize-winning designs, but of all the other designs submitted. A brief statement of some of their shortcomings may be of interest and value. First, let it be said, however, that the work as a whole showed very notable worth. Judged as practical building plans, the designs were strong, the specifications complete and the estimates accurate. It required no small amount of study and careful thought on the part of the committee to decide between them.

As in every special competition, a number of very high-grade designs—possibly prize winners—had to be thrown out because the requirements, as clearly stated, were not complied with. Studies having the full name and address of the author plainly showing; drawings finely made but unaccompanied by detailed estimate of cost or by specifications; plans that manifestly could not be carried out for the limiting sum of \$3,000; and plans forced to figure within that amount by obvious omissions and discrepancies—all such had to be rejected.

Many others fell short of the highest grade because of numerous minor points, some of space arrangement, some of construction, points which evidently had not been carefully considered.

The Question of Judgment

NO MAN can be blamed for not being infallible in his judgments; but occasions do arise at times when the contrary is so evident that the question must be asked: Was any effort at all made to arrive at true and sound conclusions?

Such a thought is brought strongly before one on reading the account of a recent building accident that occurred in the repair of a school belonging to the London, Eng., county council.

The work in hand was simply the painting of the interior, and it was being carried on by the use of the ordinary painter's trestles and boards.

One part of the wall, however, was somewhat higher than the rest, and for this the employer of the workman had sent a ladder.

The workman, however, found that to raise it some of the furniture, desks, etc., would have to be moved; and this, apparently, was too considerable a trouble. Mistake number one.

What was apparently thought the next best (and easiest) arrangement was to gain height from the trestles. For this purpose a plank, 11 inches by 3 inches, was placed upon the top rung of these, which were 12 feet high. An unwise proceeding.

A pair of steps, about 6 feet in height, were then placed upon the board and against the wall; the workman proceeded to climb these. Mistake number two.

What might have been expected, happened. His weight pushed the whole arrangement over, the result being that he was killed, and a fellow workman who was holding the steps for him (this, by the way, was the only reasonable precaution taken) was seriously injured.

Now what can be thought of this? The foreman gave evidence at the inquest, and said that the arrangement of the scaffolding met with his approval; and he added that he was still of the same opinion now that the accident had happened. So much for judgment.

Trestles, steps and ladders are notoriously dangerous to work from. The foothold offered is particularly insecure, and the handhold often insufficient. The inability to see this can only be accounted for by the deadening of the sense of danger due to lifelong habits. Added to this, there is a fallacy current in the building trade that unless a great height is reached there is no particular risk. This view is not borne out by facts. Men fall from many causes, and not always from want of nerve. These causes cannot always be foreseen, as they are not always due, as in the above case, to want of stability in the scaffolding.

Agreeing that this is true, the building operative must learn that the dangerous height to fall is not always great. A fall of about 10 feet means generally a fall upon the head, and the percentage of deaths among those suffering from fractured skulls is high. A body falling a greater height often turns in its

flight, and the damage received, while generally severe, need not be so generally fatal.



Our Conservation Program

WE ARE apt to be very altruistic in discussing ways and means of conserving our natural resources, and to picture generations yet unborn rising up and calling us blessed. As a matter of fact, this problem touches closely every one of us, and if only for selfish reasons, we should interest ourselves in the program of the conservation commission.

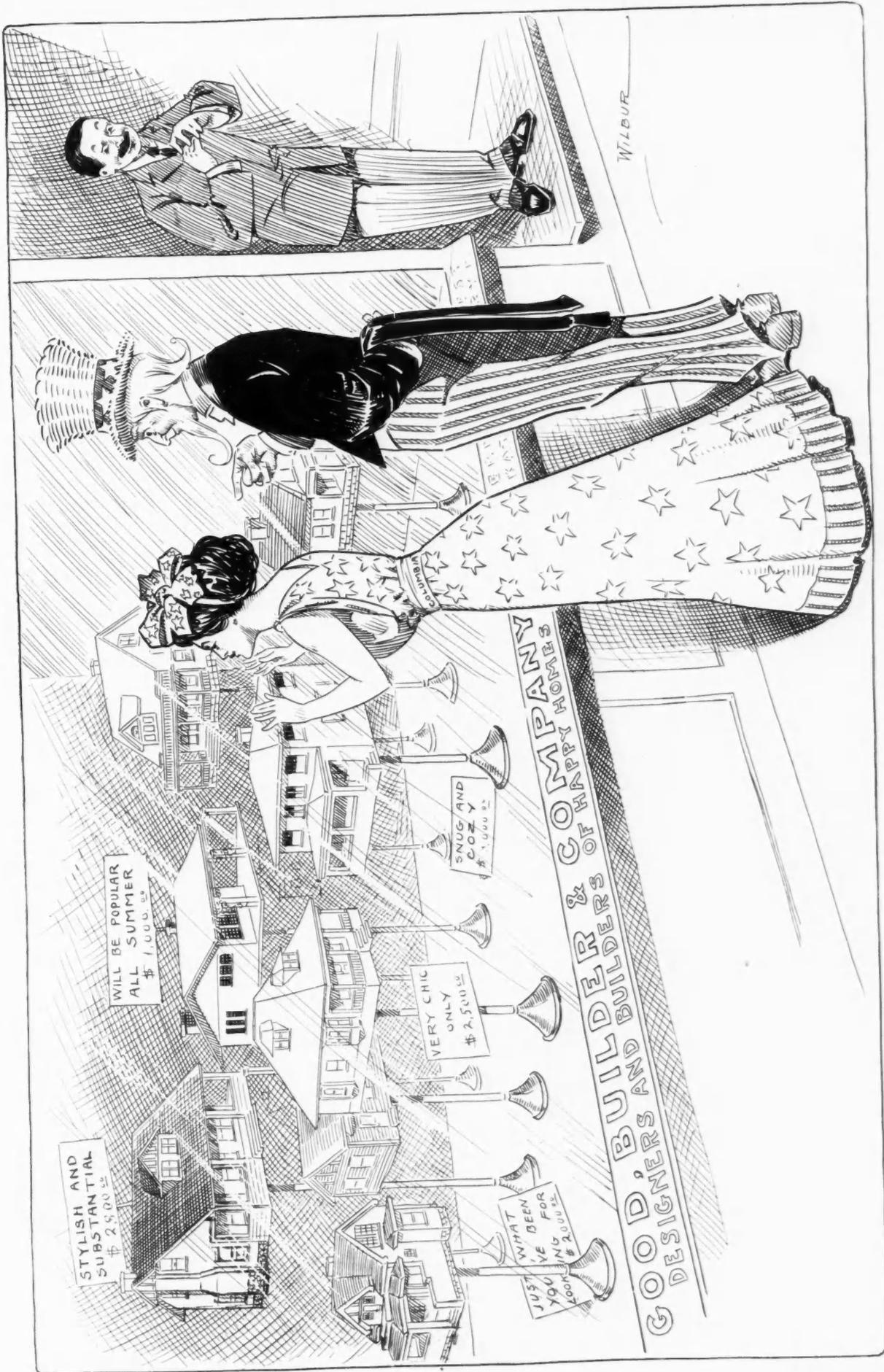
Owing to the ruthlessness with which our fathers have appropriated the wealth of the forests, coal mines, gas and oil fields, we have already begun to feel the pinch. Building materials have increased in price enormously, and it is becoming next to impossible to secure good timber for our houses. The famine in hardwoods has placed a prohibitive price on the better class of furniture. Coal is more expensive than it was, and the old-fashioned wide fireplace, merely for lack of wood to burn, has been replaced by the less picturesque gas grate.

Probably never again will we enjoy the abundance that this country once knew. Gradually we will burn up all our coal, exhaust the natural gas resources and the petroleum. By proper economy these can be made to hold out longer—maybe indefinitely—but unless new deposits are found in the Arctic regions or elsewhere, the supply some day will come to an end. To conserve our renewable assets is, moreover, as important as to stop the waste of those whose quantity is limited.

The international conference, recently held in Washington, with these objects in view, means much for the future. The riches, both of Mexico and Canada, concern directly the United States, and it is not too late effectually to safeguard the natural products of these countries. But, more than this, world-wide co-operation is now advocated.

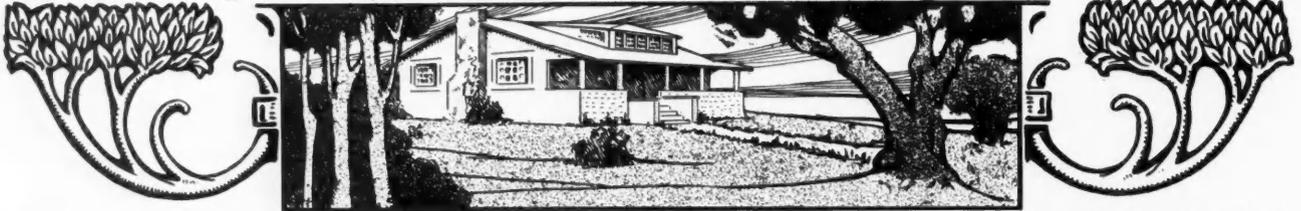
There are many ways to prevent waste, but co-operation in the application of the methods is necessary. With every state in the Union, and with our neighboring countries to the north and south acting in harmony with us, much can be done. First of all, perhaps, we must develop our waterways and regulate the use of water power. By perfecting the forestry service we can prevent the great damage to our timbered tracts by fire and by injurious insects. By more effectual fire-proofing we can protect our buildings from the vast and unnecessary fire loss every year. Furnaces that will utilize more of the heating capacity of coal are needed. Economical methods of timber cutting and of mining must be introduced.

The program, it will be seen, is comprehensive, and the government cannot do it all. The already-indicated desire on the part of private interests to co-operate in the work, however, imparts to the future a much brighter aspect than it otherwise would have.



The Real Easter Opening

BUNGALOW COMPETITION



PRIZE WINNING DESIGNS

WE TAKE pleasure in presenting this month for your consideration the four bungalow designs given the highest rating in our recent prize competition. The committee of judges, after due thought and deliberation, guided by the published rules of this particular contest, made the awards as follows:

COMPETITION—BUNGALOW CLASS

First prize, \$50—Jos. A. Reichel, El Paso, Ill.

Second prize, \$25—E. G. Groves, Indianapolis, Ind.

Third prize, \$15—W. H. Gard, Delavan, Ill.

Fourth prize, \$10—Harry Hann, St. Louis, Mo.

This competition has been, in a good many ways, rather out of the ordinary. It has been in no sense the regulation architectural competition. It was planned and announced as a testing ground for the

carpenter and the contractor, in his very important and useful role of house planner. It has been the source of much gratification to the editor that the practical builders of this country responded in such numbers, and their work—while lacking, perhaps, that artistic finish which usually, in competitions, means so much—yet possessed so many elements of real worth.

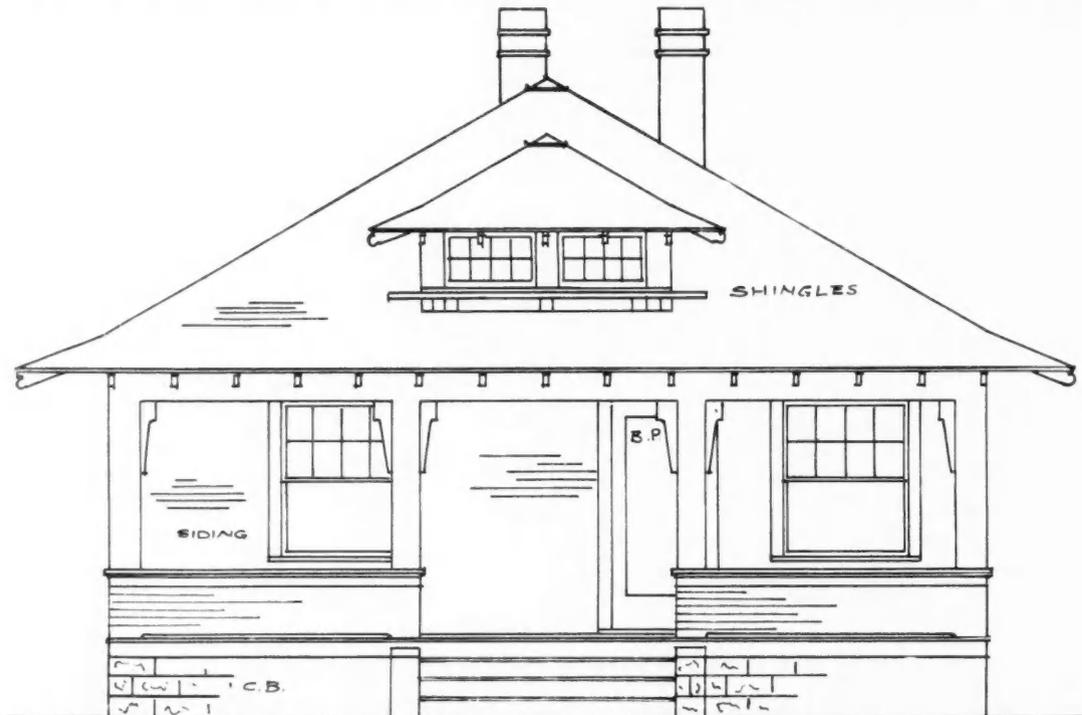
Now it must not be inferred from this that any discrimination was made against the submitted work of the brother architects, or any undue preference shown. The committee of judges, themselves skilled architects of wide experience, were frank in stating that in this case the designs were judged, not as pictured works of art, but as practical building plans. How will it look when built? Is the estimated cost correct? Are the construction and the arrangement practical? Those were the main questions considered.

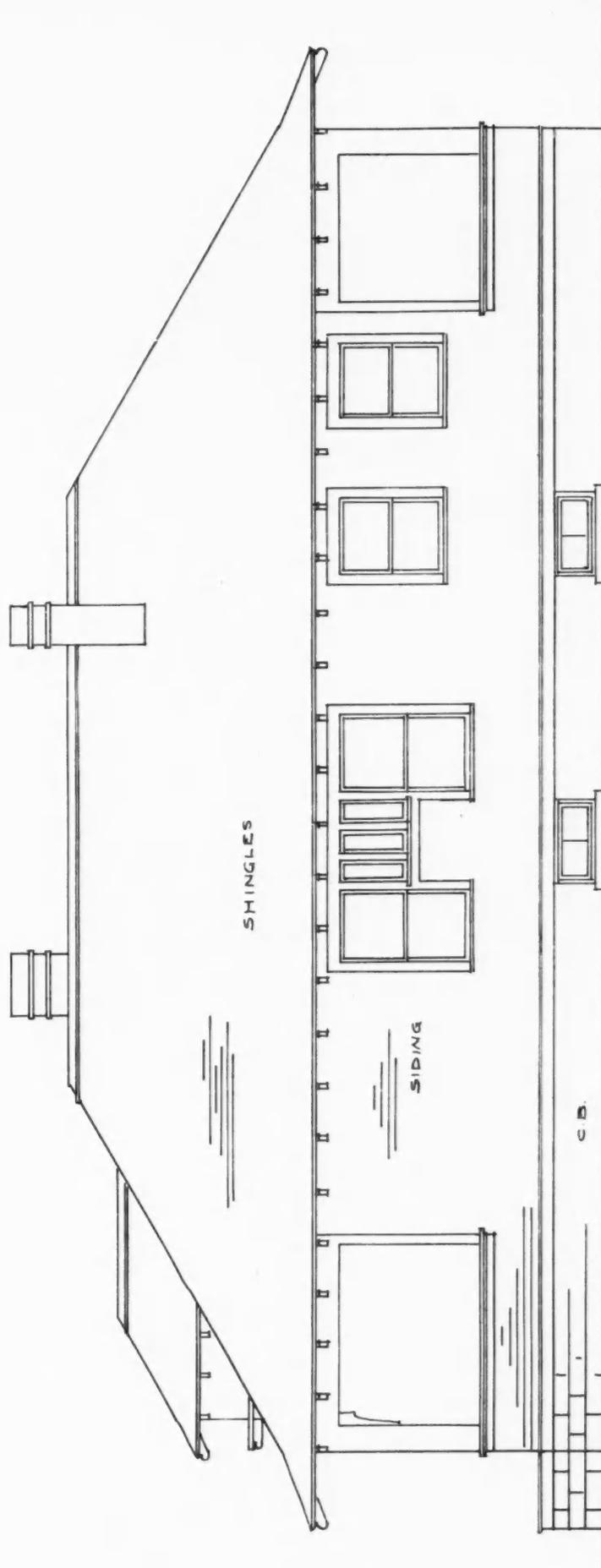
First Prize—Bungalow to Cost \$2,500

Designed by Jos. A. Reichel, El Paso, Ill.

THIS five-room bungalow is to have concrete block foundation above grade, good brick below and in chimneys; concrete floor for entire basement; shingle roof; patent plaster finished for paper-

ing; plain white oak trim in reception hall, living and dining rooms, balance hard pine. All inside trim is to be finished natural. The estimate provides for plain, double strength glass throughout, except for front

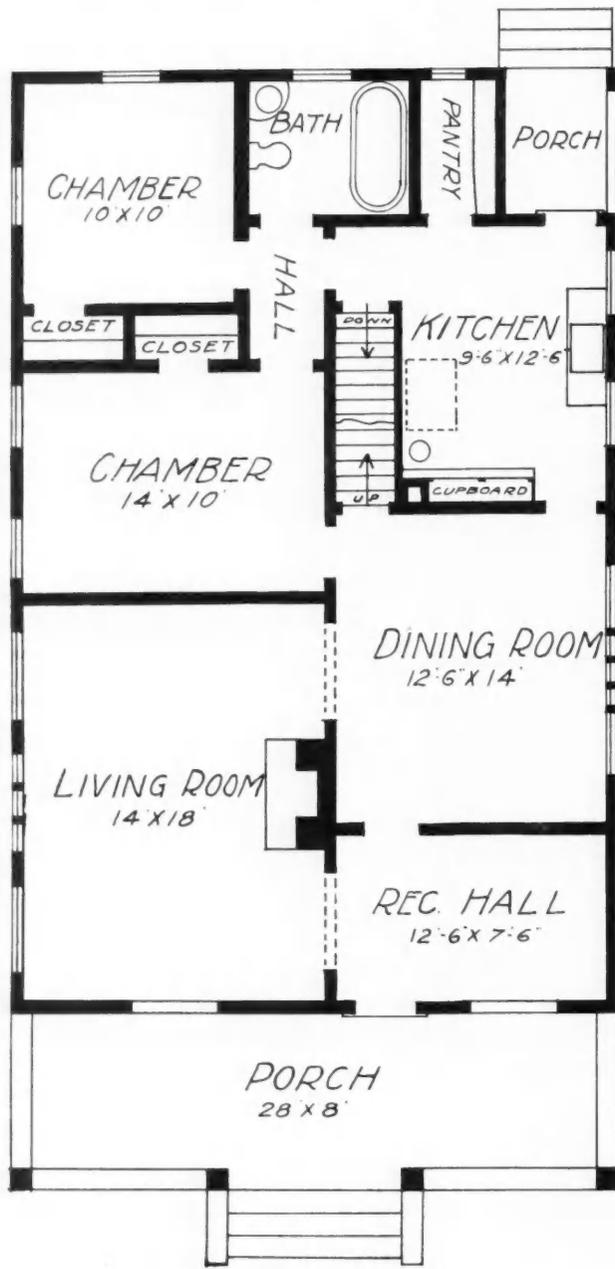




SIDE ELEVATION

door, which is bevel plate. Outside is to be finished with one prime and two other coats of paint. Hot air furnace, a good grade of plumbing, electric wiring,

clear cypress siding. Exterior finish lumber is to be clear cypress.



Floor Plan—\$2,500 Bungalow

cistern and cesspool are provided for. Framing lumber is to be No. 1 hard pine; frame sheathed outside with 6-inch No. 2 D. & M., papered and sided with

Estimate of Cost

236 cu. yds. excavating	\$ 47.20
Grading and filling	10.00
Foundation and chimneys, labor \$70, material \$245	315.00
Cistern and cesspool, labor \$23, material \$23.	46.00
Carpentry, material only, as follows:	
1,204 sq. ft. 1st floor (including nails)	96.32
190 lineal ft. sills (including nails)	19.00
1,204 sq. ft. 2d floor (including plastered ceiling)	108.36
1,278 sq. ft. outside walls (including plastering)	174.83
1,341 sq. ft. inside walls (including plastering)	110.36
Note: Plastering figured at 28c per sq. yard.	
1,550 sq. ft. shingle roof, including rafters, sheathing, etc.	80.75
259 sq. ft. porch floor	18.77
220 sq. ft. porch ceiling	12.95
Porch millwork, including outside steps.	31.50
Porch railing	16.00
210 lineal ft. cornice and dormer millwork. .	84.00
Inside stairs	16.00
Basement stairs and bulkhead	6.00
Millwork, sash, glass, frames and trim.	263.00
523 sq. ft. plain white oak flooring	46.00
Note: Nails included in above items.	
Painting, inside and out, labor \$68, material \$42	110.00
Tinning, labor \$12, material \$30.	42.00
Plumbing, labor \$87, material \$109.	196.00
Carpenter labor	360.00
Furnace complete	140.00
Finish hardware	36.00
Electric wiring	18.00
<hr/>	
Total	\$2,404.04

Current local prices were used in figuring the above as follows: Bricklayers, per hour, 50c; carpenters, per hour, 40c; common labor, 20c; plasterers, 40c; brick, per M, \$7.50; concrete blocks, 8 by 8 by 16, rough face, 15c each; framing lumber, per M, \$19.50 to \$26; cypress finish, per M, \$50 to \$55; cypress siding (4-inch), per M, \$26; hard pine flat sawed flooring, \$29; hard pine D. & M. No. 2, \$18.

Second Prize—Bungalow to Cost \$2,100

Designed by Eugene G. Groves, Indianapolis, Ind.

THE bungalow plan herewith was designed to be built in Indianapolis, Ind.; and cost is based on market prices there, prices given being estimated in accordance with bids for sub-contracts of similar nature in this locality.

The design of this bungalow is one of a very popular type known as a stucco finish. It is veneered to a height of four feet and one inch above the rock-

faced foundation with paneled face cement blocks three inches thick. The foundation of rock-faced cement blocks reaches three courses above the ground and is laid upon the basement wall which is of concrete and ten inches thick. The veneer blocks are anchored to the studding with galvanized iron anchors and are capped by a cement water-table.

The cement blocks are all laid with raised bead

joints; and the stucco finishes out to the cornice, making a cove mold. The cornice has a projection of two feet six inches, which not only gives a pleasing appearance but also affords protection to the stucco plaster. The stucco is tinted a buff color and trimmed with popular strips which are painted a dark brown. The

The hall, living room and dining room are finished in a rich golden oak and laid with oak floors. All cap trim in these rooms as per detail herewith. The other rooms are finished in yellow pine, plain trim, and stained to match the oak.

The plumbing is all very compactly arranged and



○ FRONT ELEVATION ○

roof is stained a dark green shade and the sash are painted white. The terraced porch is built of the paneled blocks and is plastered on the inside. It is spanned by a six by eight timber which supports the porch roof. The three double-hung bedroom windows reach the four-inch sill course, and the other windows except the oriel and front casement windows, reach only to the water-table.

The living room has one, and the dining room two.

the piping should be installed so that connections to the furnace for hot water and to laundry tubs in the large apartment adjoining the furnace room can be easily made at any time, if desired.

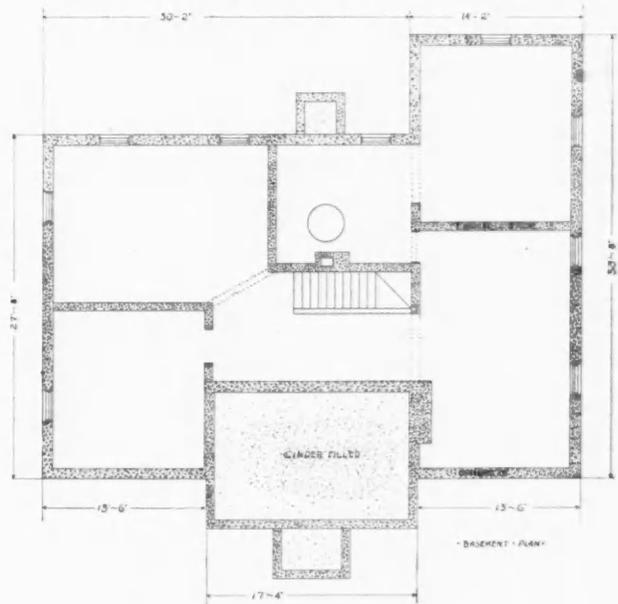
The basement is seven feet high in the clear and has a concrete floor three inches thick.

Estimate of Cost

Excavation, 148 yds., at 30c.....\$ 44.40



casement windows located three feet three inches from the floor. The large oriel window in the living room provides a roomy window seat; and the upper sash, which are of plain leaded glass and controlled by transom lifts, will afford plenty of ventilation.

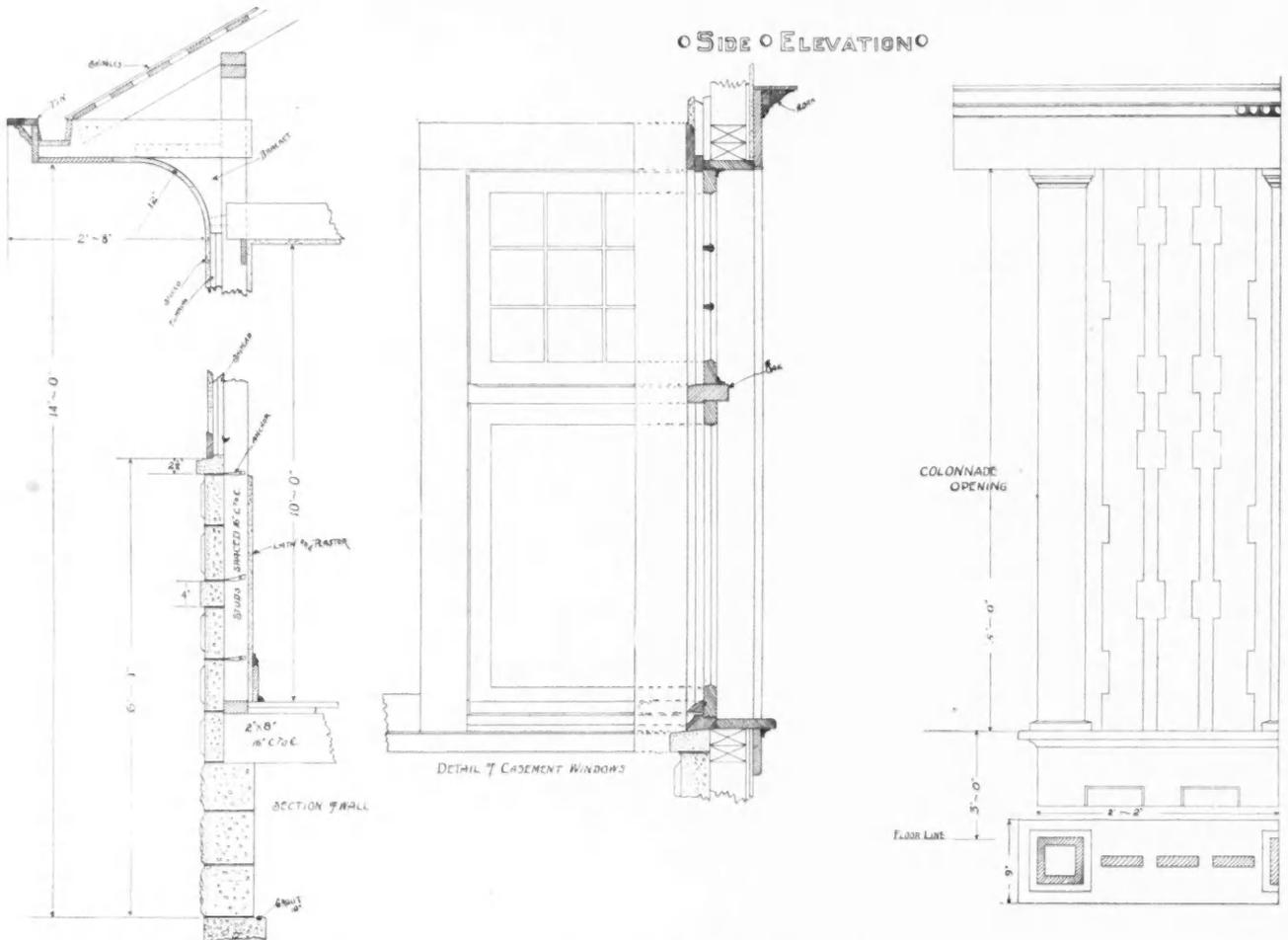
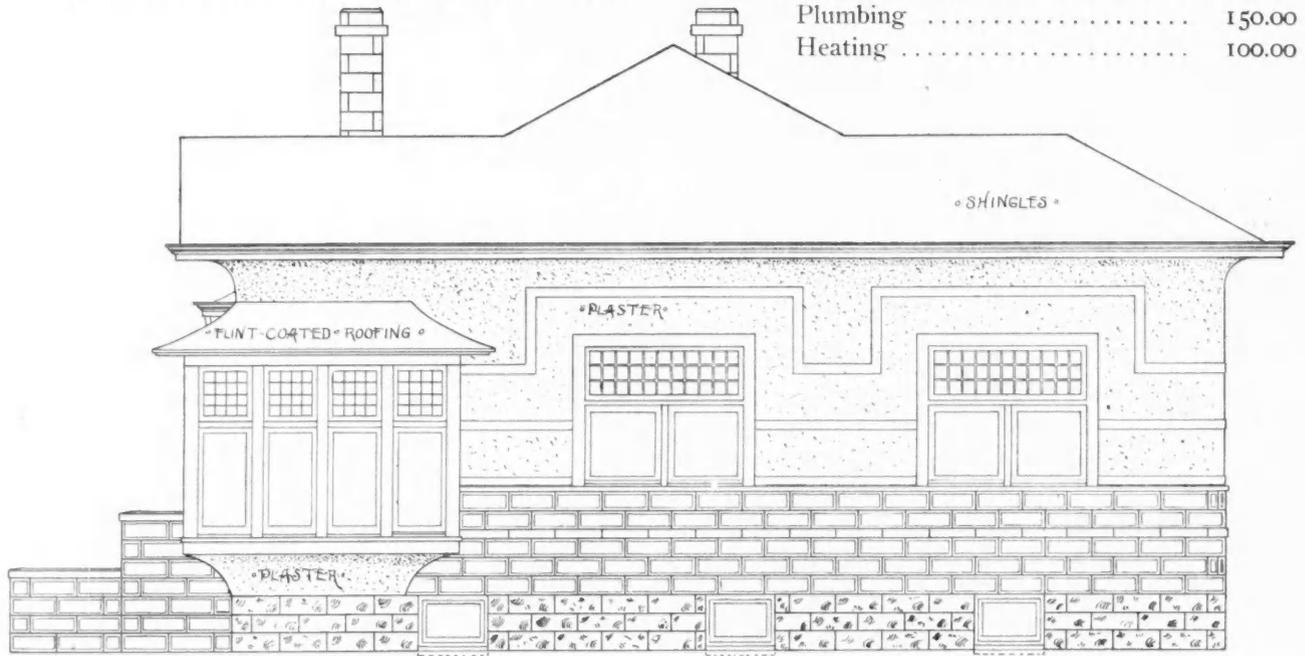


Cement work—

300 plain stone in basement, at 11c..... 33.00
 Labor on same, at 35c..... 11.90

35 yds. grout placed (labor, 17½c),
 at \$6\$ 210.00
 32 lineal feet of cement steps, at 40c... 12.80

Carpenter work, at 27½c, 40% of millwork..\$ 170.80
 Inside plastering, 458 yds., at 25c..... 114.50
 Exterior plastering, 200 yds., at 60c..... 120.00
 Plumbing 150.00
 Heating 100.00



176 sq. ft. porch floor, at 15c..... 26.40
 1,060 face stone in wall, at 13½c..... 143.10
 Labor on same, at 35c..... 47.60
 Frame, shingles, outside trim and chimneys. 311.38
 Millwork, mantel, sash and doors..... 427.60

Painting and staining 60.00
 Varnishing and finishing 40.00
 Hardware and nails 40.00
 Total net cost to contractor.....\$2,061.48

Third Prize—Bungalow to Cost \$3,000

Designed by W. H. Gard, Delavan, Ill.

THE basement will be 7 feet deep under entire house, with the outside walls of 8 by 8 by 16-inch concrete blocks, started from a solid concrete footing. All division walls will rest on solid concrete footings, those bearing joists to be studded with 2 by 6, set 16 inches o. c. The entire basement floor is to be of concrete.

The frame will be a balloon frame, using 2 by 6-inch studding, lined with No. 2 8-inch yellow pine shiplap for all outside walls. All joists, studs, etc., are to be set on 16 centers. The outside will be finished with 1 by 10 rough cypress, up to the sill course, or shingled as shown; sill course to extend across windows and to have tin flashings put on so as to allow the sub-sills of frames to be rebated and set down over flashings. Walls above sill course will be sided with 4-inch clear red cypress siding, put on to show not less than 2 3/4 inches. All walls to be first covered with layer of three-ply rosin-sized paper.

The veranda floors are to be of 7/8 by 3 1/4 fir floor-

The plaster will be left in medium sand finish for tinting.

Flues and fire place to be of good grade sand-faced brick where exposed, laid up with white mortar joints and provided with either cut stone or cement stone caps. Also provide stone sills for basement windows.

The roof will be covered with clear red cypress shingles laid 4 1/2 inches to weather with 3 1/2 penny double cut nails. All shingles to be dipped in moss green shingle stain before being laid.

The interior finish will be of yellow pine in chambers and rear part of house and plain red oak in dining room and living room.

The plumbing will include full bathroom outfit of iron, porcelain enameled ware. Kitchen plumbing and laundry tubs in basement all installed in latest approved sanitary manner.

The bungalow is to be heated with hot air furnace, put in with a cold air return flue from each room leading to central cold air boxes, provided with screens



FRONT ELEVATION

ing, primed before being laid; all cornice lumber, outside casings, etc., to be of clear, well-seasoned cypress. Porch columns to be of 10 by 10 rough columns, stained.

All veranda ceilings and soffit of cornice to be finished with 5/8 by 3 1/4 beaded yellow pine ceiling; or porch ceiling may be plastered if preferred.

Porch balustrade and colonial lattice shown on plans to be of 2 by 4 or 2 by 6 rough cypress lumber, suitable for staining.

The entire first story will have a sub-floor of No. 2 yellow pine 6-inch fencing, laid diagonally, and nailed with two nails to each bearing; finished floors as indicated on plans.

Attic is to be floored with No. 2 6-inch yellow pine flooring with defects cut out.

of coarse cloth or fine wire to catch lint and dust which usually collects in cold air boxes and is drawn through furnace and forced into the rooms with the heated air. All registers to be side wall registers.

Estimate of Cost

170 yds. excavating, at 25c.....	\$ 43.75
645 cu. ft. concrete blocks laid in wall, at 25c.....	161.25
Porch piers and step sides.....	28.00
100 lineal ft. footings, at 12c.....	12.00
28 ft. 9 by 13 flue, at \$1.....	28.00
Fireplace and flue complete.....	63.30
Stone sills and chimney caps.....	11.60
Basement floors, 140 yds., at 45c.....	63.00
Total mason work.....	\$ 410.90

Lumber Bill

	Ft. B. M.
78 pieces, 2 by 10 by 16, floor joists and sills	2,106
8 pieces, 2 by 10 by 14, sills and porch truss	184
4 pieces, 2 by 10 by 12, porch truss	80
135 pieces, 2 by 6 by 10, outside studs	1,350

4 pieces, 2 by 8 by 12, ceiling joists, porches	64
160 pieces, 2 by 4 by 10, studs	1,120
10 pieces, 2 by 4 by 16, plates	110
20 pieces, 2 by 4 by 14, plates	180
10 pieces, 2 by 4 by 12, plates	81

Ft. B. M.



LEFT SIDE ELEVATION

32 pieces, 2 by 6 by 16, plates	512
24 pieces, 2 by 6 by 16, basement studs	384
16 pieces, 2 by 6 by 14, plates	224
56 pieces, 2 by 6 by 22, rafters	1,236

15 pieces, 2 by 4 by 16, dormers	165
24 pieces, 2 by 4 by 12, studs in attic	192

Total	10,272
At 22c	\$225.99
2,200 ft. No. 2 8-in. y. p. shiplap lining, at \$20	44.00
2,700 ft. No. 2 6-in. y. p. fencing, sub-floor and roof sheathing	51.30
12 pieces, 1 by 12 by 14 cypress gable siding, at \$45.00	7.56
32 pieces, 1 by 12 by 12, cypress gable siding, at \$45.00	17.28
566 linear ft. battens	4.53
1,400 ft. No. 1 r. c. siding, at \$30.00	42.00
800 ft. No. 1 y. p. ceiling, at \$25.00	20.00
550 ft. clear and rough 1 by 8 in. cypress, at \$47.00	25.85
1,400 ft. No. 2 6-in. y. p. flooring, at \$20.00	28.00
1,000 ft. T. & G. y. p. flooring, 2 1/4-in. face, at \$40.00	40.00
675 ft. clear, 5/8 by 2 1/4, at \$52.00	35.10
475 ft. clear fir flooring, 7/8 by 3 1/4, at \$40.00	19.00
23 M. 5 by 2 clear r. c. shingles, at \$3.75	86.25



FLOOR PLAN

18 pieces, 2 by 6 by 18, rafters	324
76 pieces, 2 by 6 by 16, ceiling joists	1,286
36 pieces, 2 by 8 by 14, ceiling joists, porches	684

Total lumber bill..... \$647.13

Mill Bill

8 front porch columns, complete, at \$3.00	\$24.00
2 rear porch columns, complete, at \$2.60	5.20
32 ft. 4 by 8 porch rail, top	2.13
30 ft. 3 by 6 porch rail, bottom	1.35

10 basement window frames, at \$1.10.....	\$ 10.80
2 basement stairs, mill construction.....	8.00
4 basement doors, batten, at 80c.....	3.20
7 doors, 2-6 by 7-0, 1 3/8 y p., at \$2.80...	19.60
1 door, 2-8 by 7-0, 1 3/8 y. p., at \$2.85...	2.85
2 doors, 2-4 by 7-0, 1 3/8 y. p., at \$2.75...	5.50
2 doors, 2-0 by 7-0, 1 3/8 y. p., at \$2.60...	5.20
1 door, 2-8 by 7-0, 1 3/4 oak, at \$5.80....	5.80
1 door, 2-6 by 7-0, 1 3/4 oak, at \$5.80....	5.80
2 doors, 3-0 by 7-0, 1 3/4 oak, at \$6.20...	12.40
1 front door, oak, 1 3/4, at \$14.00.....	14.00
1 kitchen door, white pine, 1 3/4, at \$6.50...	6.50
1 storm door, white pine, 1 3/4, at \$3.20....	3.20
4 windows, 14 by 18, 2-lt., 1 3/4, at \$1.40...	5.60
6 windows, 12 by 20, 2-lt., 1 3/8, at \$1.30...	7.80
4 dormer windows, at \$1.00.....	4.00
3 windows, 48 by 34, 2-lt., top divided, 1 3/4, at \$6.50	19.50
5 windows, 30 by 34, 2-lt., top divided, 1 3/4, at \$3.40	17.00
2 windows, 30 by 24, 2-lt., plain, 1 3/4, at \$2.10	4.20
1 window, 34 by 24, 2-lt., plain, 1 3/4, at \$2.25	2.25
4 windows, 12 by 18, Dutch windows, 2-lt., leaded, at \$1.80.....	7.20
Window frames, complete.....	43.00
Door frames	5.20
Yellow pine trim, complete.....	32.84
Oak casings, base and seats, complete.....	41.25
China closets, pantry and kitchen cases.....	56.00

Total mill bill.....	\$380.37
Painting and inside finishing.....	\$145.00
Electric wiring	53.50
Furnace installed, complete.....	220.00

Plumbing

1 5-ft. enameled bath tub, with connections complete.	
1 syphon jet, low-down closet, with connections complete.	
1 18 by 24, 5-inch apron lavatory, with connections complete.	
1 20 by 30 porcelain enameled sink.	
1 30-gal. range boiler, connections and stand.	
1 40-gal. compression tank.	
1 Buckeye water lift.	
1 2-part laundry tub.	
All installed in first-class sanitary manner, using nickel-plated traps and supply pipes, lead pipe where not exposed and galvanized iron where exposed; complete in every respect	\$243.00
Hardware, including wrought bronze inside finish	120.00
Plastering, 630 yds., at 28c.....	176.40

Recapitulation

Mason and foundation work.....	\$410.90
Lumber bill	647.13
Mill bill	380.37
Painter's bill	145.00
Electric wiring	53.50
Furnace	220.00
Plumbing	243.00
Hardware	120.00
Plastering	176.40
Carpentry	520.00
Incidentals	70.00

Total cost	\$2,986.30
Labor figured on basis of \$1.75 to \$2.50 for common labor and 30 to 40 cents per hour for mechanics. Mason's labor 45 cents per hour and tender 20 cents.	

Fourth Prize—Bungalow to Cost \$1,700

Designed by Harry Hann, St. Louis, Mo.

THIS design is for a dwelling, or cottage, for lot 32 or more feet in width, built of good, sound materials of their respective kinds. Concrete walls and footing made of one part Portland cement, three parts sand and four parts gravel. Cellar floor of same, with one-fourth inch wearing coat of one cement and two parts sand. Concrete blocks made of one cement and four parts sand. Chimney to be of hard-burned red brick. French drain to consist of 4-inch drain tile and coarse broken stone.

All dimension lumber is to be of sound pine, free from knots and all joint, studding and rafters to be spaced 16-inch centers, well nailed. Exterior walls to be covered with sheathing and white pine, lap siding.

All flooring is to be No. 1 riff sawed surface yellow pine, and well surfaced again when laid.

All interior walls and ceiling to be covered with plaster board, and no plastering to be used.

Parlor, alcove, reception hall and dining room to be

finished in oak; balance of house in long leaf yellow pine.

Mantle in parlor, oak, with tile face and hearth and coal grate. Also bevel plate mirror, 16 by 48 inches.

Sliding door, 3 feet 6 inches by 7 feet 10 inches.

Front door, 3 by 7 feet, oak.

Closet and bathroom doors, 2 feet 6 inches by 6 feet 8 inches.

All other doors, 2 feet 8 inches by 6 feet 8 inches.

All doors to have transom with glass.

Alcove opening to have grille.

Parlor window bottom light, 48 by 50 inches.

Parlor window, top light, 48 by 22 inches.

Alcove, bath and reception hall windows to be single light, 20 by 40-inch glass, inside hinged sash.

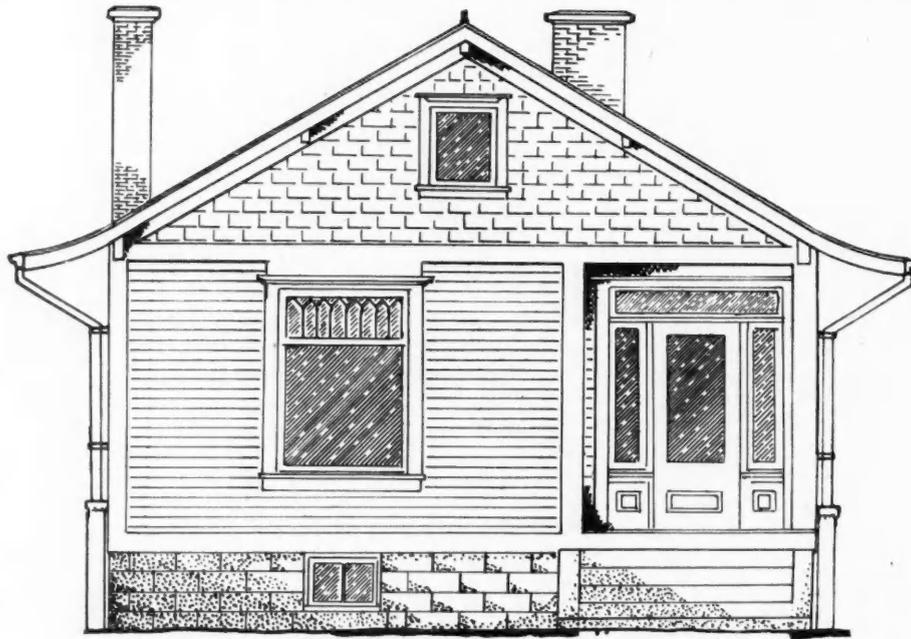
Side lights at front door to be 12 by 48-inch bevel glass, and all other windows to have 38 by 30-inch glass.

Attic windows to have 22 by 32-inch glass, and sash

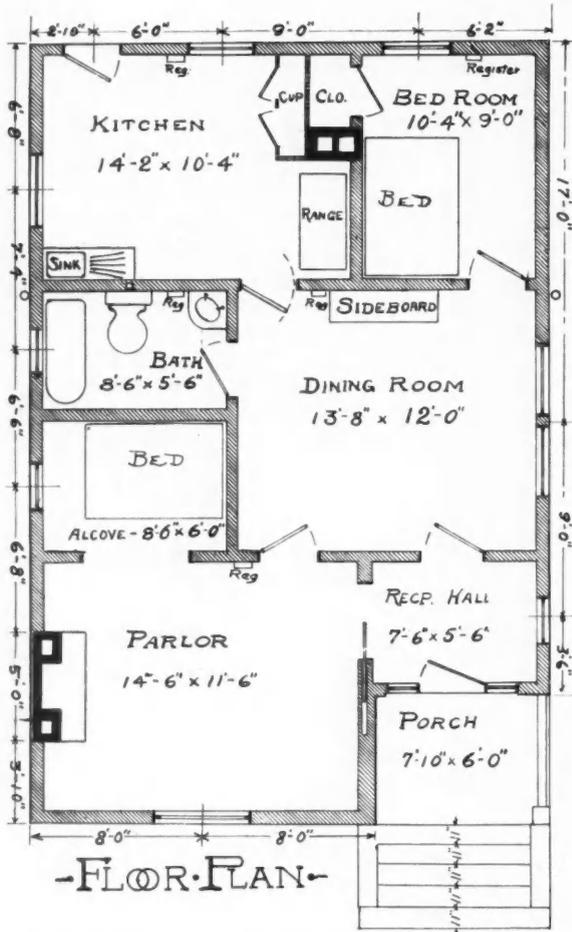
are bottom hinged. Roof to have asphalt shingles on sheathing and floor as shown respectively. Ridge, gutters, downspouts and chimney flashing to be old-style tin.

drain to concrete to sewer 5 or more feet from building.

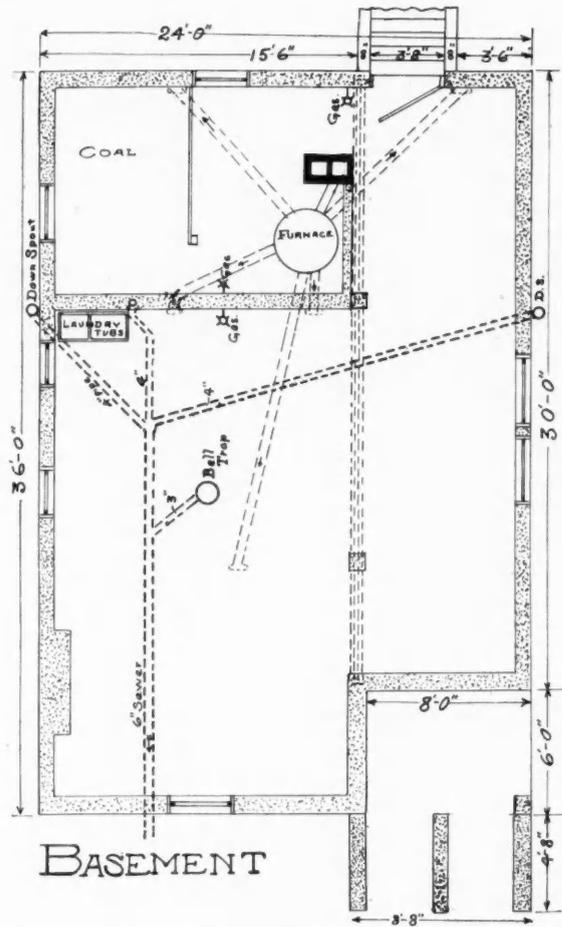
All lighting to be combination gas and electric, with



FRONT



-FLOOR PLAN-



BASEMENT

All plumbing to be as shown; with 5 ft. tub, low tank closet, iron washstand and sink, all white enamel finish with nicked brass fixtures; and all soil pipe to be cast iron, five feet beyond building, and French

approved type of fixtures, and gas connection to range.

All water supply lines to be galvanized iron.

Painting outside to have one filler and two coats body paint.

All interior to have one filler and two coats hard oil,
all natural finish.

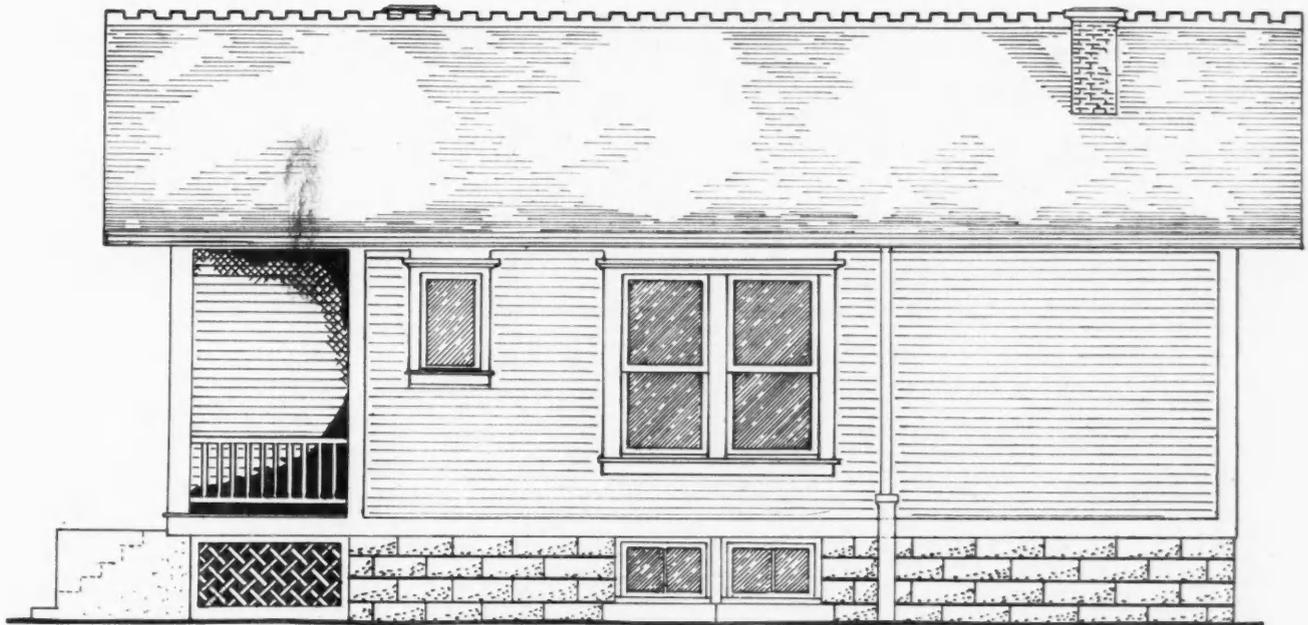
The bill of material is as follows:

- 2 by 8 by 12 ft., 20 pieces.
- 2 by 8 by 8 ft., 27 pieces. Joist.
- 2 by 8 by 16 ft., 27 pieces. Joist.
- 2 by 4 by 12 ft., 35 pieces.
- 2 by 12 by 12 ft., 1 piece. Girder.
- 2 by 12 by 20 ft., 1 piece. Girder.
- 2 by 4 by 9 ft., 140 pieces. Studding.
- 2 by 6 by 16 ft., 27 pieces. Attic joist.
- 2 by 6 by 9 ft., 27 pieces. Attic joist.

- 6 inside doors and frames.
- 1 inside door and frame rolling.
- 1 mantel for parlor.

Estimate of Cost

Excavating and grading.....	\$ 52.00
Walls, cellar floor, chimney and fireplaces....	125.00
Labor on same.....	70.00
Lumber	493.00
Mill work, doors and windows, including glass and mantel	198.00
Roofing, 14 squares.....	75.00
Labor on same.....	16.00



~ SIDE ELEVATION ~

- 2 by 6 by 12 ft., 62 pieces. Rafters.
- 2 by 10 by 8 ft., 62 pieces. Rafters.
- 1 by 8 by 12 ft., 20 pieces. Exterior trim.
- 1 by 8 by 9 ft., 12 pieces. Exterior trim.
- 1 by 10 by 9 ft., 4 pieces. Exterior trim.
- 850 ft. lap siding.
- 1½ sq. shingles for gables.
- 1,400 sq. ft. sheathing for roof.
- 200 sq. ft. of 1-inch board for concreting.
- 900 sq. ft. flooring.
- 200 sq. ft. 1 by 12 cutting pine.
- 4 pc. 3 by 12 by 16 ft. for projecting purlin.
- 218 lineal ft. interior base board (trim).
- Nails and screws and hardware.
- 1,000 ft. sheathing.
- 7 cellar windows with frames.
- 5 one light windows with frames.
- 1 large leaded window with frames.
- 1 double window with frames (Dining Room).
- 3-4 light window with frames.
- 1-1 light transit window.
- 2-1 light Colonial window.
- 1-1 light door for front.
- 1 outside kitchen door and frame.

Plaster board, 2,800 sq. ft.....	104.00
Hardware, etc.	38.00
Carpenter work	127.00
Tin	32.00
Tinning	20.00
Painting materials	24.00
Painting labor	34.00
Plumbing	138.00
Labor on same.....	42.00
Wall paper and papering.....	48.00
Total cost	\$1,636.00

To Harden Cast Iron

To one gallon or a little more of water add one pound of strong concentrated sulphuric acid and one ounce of nitric acid; heat the cast iron to a cherry heat and place in the solution.

A grocery journal says the first pretzels were made in America in 1810. This statement is readily accepted, and we also believe that some of them are still in circulation.



A Bungalow by the Sea

By M. H. Northend

UPON the estate of Mr. John Hays Hammond, at Fresh Water Cove, Gloucester, Mass., is a most interesting bungalow, which was planned by his eldest son, Mr. Harris Hammond, as a retreat for himself, his brothers, and their guests. His ideas were successfully worked out by Messrs. Wheelwright and Haven, of Boston, and the result is a bungalow in every respect suited to its rugged surroundings.

It stands upon the crest of a rocky headland, which projects into the sea, and commands a view of Gloucester harbor and the quaint old seaport colony of Cape Ann, as well as Eastern point and the sea which lies beyond. It is built close to a cliff, which slopes at one side, and is partially surrounded by a high sea wall, constructed of stones picked up on the estate.

At the front, rear and one side of the bungalow are stretches of turf-covered lawn, brightened at intervals by beds of flowers. A semi-circular wall outlines the end of the side lawn, and it connects with a short flight of stone steps which lead down to the rocks below.

The exterior finish of the bungalow is of unstained shingles, whose wood tint will deepen from year to year into harmony with the surrounding cliffs. The hip roof is also covered with shingles. Across the front of the dwelling and a portion of either side extends a veranda, about ten feet in width, outlined by a low balustrade of fieldstone, and shaded by a rustic pergola, constructed of heavy, dark brown, hewn timbers, over which creepers twine. The veranda is furnished with hammocks, comfortable green willow chairs and Mission tables. Above this veranda is a balcony, entered from the gallery within the house, and furnished for the enjoyment of the superb sea view.

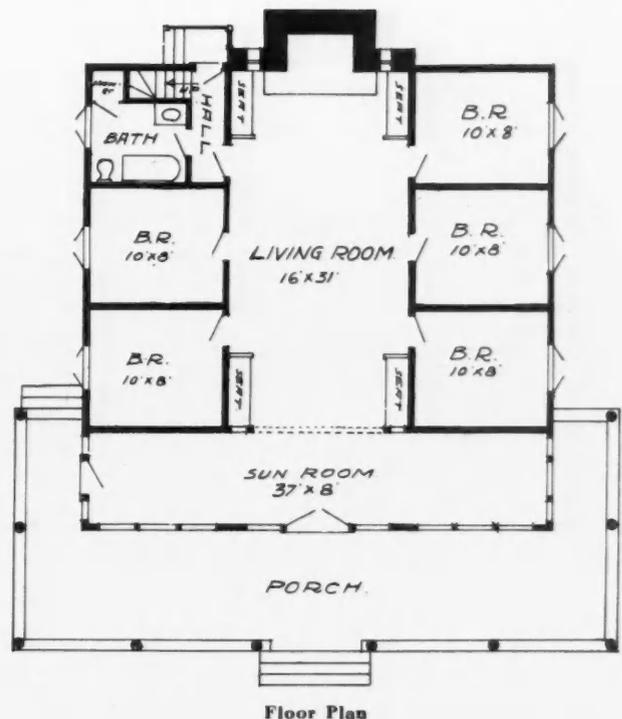


The Sun Room

The great chimney at the rear of the bungalow is an interesting feature. It is constructed of seventy-five tons of hewn rock and stones, and extends high above the eaves. On each side of the chimney, at about ten feet from the ground, are two narrow leaded windows, and eight feet above each of these are two double windows built directly under the eaves. In addition, three low, broad, small-paned windows extend on the sides of the building and furnish light to the sleeping apartments.

To the right of the chimney is the entrance door. It opens upon a small entry, seven feet in width, which opens into the hall, or living room, a spacious apartment, occupying practically the entire center of the bungalow. It is thirty feet long by sixteen feet wide, and is open to the rafters to a height of twenty-five feet. It is finished, as is the entire interior, in pine sheathing stained moss-green, and the floor is of polished hardwood. Around three sides of the room, about ten feet above the floor, extends a gallery, its balustrade ornamented with Navajo blankets, Indian baskets, Zulu shields, and other trophies of far-off lands. This gallery is three feet wide, and the walls above are hung with water-colors. Two doors open from it to a camphor closet and a store room.

The entire western end of the living room is occupied by the fireplace, its stone work extending up to



The Living Room, Showing the Remarkable "Smokeless" Fireplace

the roof. The fireplace proper is six feet wide, four and one-half feet deep and four feet eight inches high. The stones composing it are two feet thick and the chimney has never been known to smoke—the most remarkable feature of this fireplace is its splendid draught. No andirons are used, the logs burning freely by simply being thrown upon the hearth. This hearth is five feet wide, and is constructed of red Dutch tiles, one of which is removable, so that the ashes of the fire may be swept down into an iron barrel below.

Two feet above the fireplace is a broad, granite

nishings of the room are of the Mission type. Book-cases, glassed in with small panes set in lead, extend along either side of the room. Doors lead off at each side of the apartment to the five sleeping rooms, the lavatory and entrance hall.

Extending across the seaward side of the bungalow and connecting with the living room is the sun parlor, an interesting apartment thirty-seven feet long by eight wide. The entire front of this room, and the ends, including the doors which directly face the fireplace, have plate-glass windows. Long settees, stained green and



Veranda of the Hammond Bungalow and the Sea View

mantel which serves to display cups and other trophies, and just above, about halfway up the chimney breast, is a magnificent moose head. The fireplace is flanked on either side by a high-back settle, stained green and cushioned in dark red. The pelt of a polar bear made into a rug, copper bottomed and riveted throughout, lies in front of the fire, and a rib of some old ship, wrecked off the Gloucester coast, answers the purpose of a footrest.

Overhead are heavy 6 by 8 hewn rafters, from the central one of which a large electric lamp is suspended upon an iron chain directly over the table. The fur-

nishings of the room are of the Mission type. Book-cases, glassed in with small panes set in lead, extend along each side of the room, and invite one to lounge and contemplate the ever-changing beauty of the sea.

A gas burner in the basement of the house is connected with the coil, and supplies hot water at all times. This basement is now used as the storehouse, but it is so arranged that it can be fitted up as a kitchen, at small expense, if so desired, later on. The bungalow is fully equipped with electricity.

It is truly a charming retreat, ideal in location and equipment. Its cost complete was \$3,500.

STEEL SQUARE

ALFRED W. WOODS

Possibilities of the Steel Square

HOW TO USE THE STEEL SQUARE IN THE SQUARING OF FOUNDATIONS AND FOR MEASURING INACCESSIBLE DISTANCES

GREAT are the possibilities of the steel square in solving problems from the simplest to the most intricate; from squaring off the end of a board to the solving of problems in higher mathematics. There is no doubt about that; it goes without question; yet, strange to say, it is the one instrument whose capabilities are the least understood of all the tools that are found on the hardware dealer's shelves. A universal instrument, confined to no one trade in particular, it may be found in the hands of all mechanical tradesmen, from the humblest laborer to the most skilled mechanic, each finding it a useful tool so far as he is capable of using it. Its own uses, those to which it may best be applied, are seemingly unmeasured. Our talk for this and the next few numbers will be somewhat out of the ordinary of the common run of work for which the steel square is used and for which the ordinary calculations are made.

To begin with, we will take the operation of squaring a building for masonry or other work. Every mechanic knows that a triangle whose sides measure 6, 8 and 10 forms a true right angle, and is the method commonly used

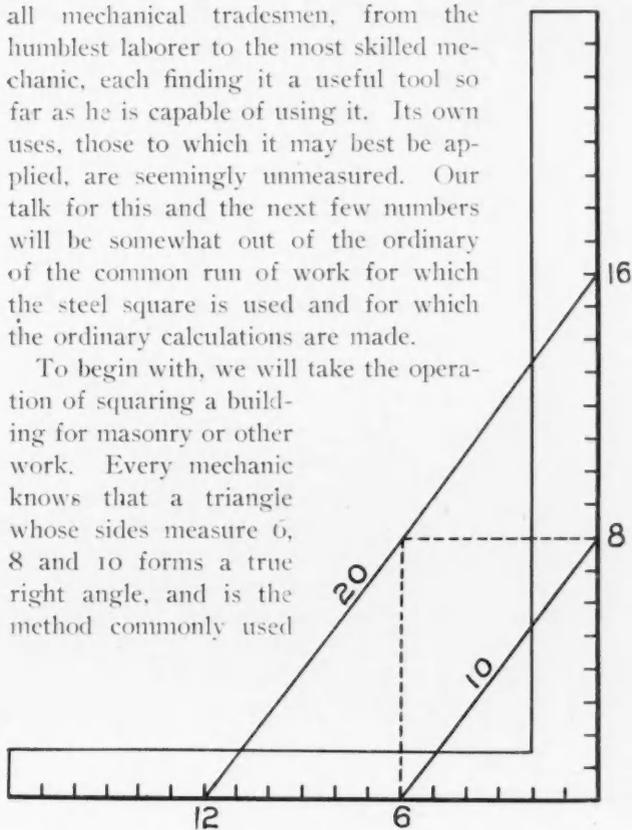


FIG. 240.

in squaring foundations. But how many ever stopped to think what other figures on the square will give the same results? By the use of trigonometry we find only three places, using 12 on the tongue as a basis and measuring to the inches on the blade, that do not give fractions of one inch for the hypotenuse side. These three are as follows:

From 12 to 5 gives 13; 12 to 9 gives 15 and 12 to

16 gives 20. Now, as a 10-foot pole is usually used to square a right-angled corner, it is found that all of the above numbers contain lengths greater than the pole, so that it is necessary to take their proportions. The first set, 12, 5 and 13, contains numbers not divisible without fractions, consequently we will pass on to the next.

In this, 12, 9 and 15, we find that 3 is the only number that will equally divide all of the numbers with quotients, as follows:

Four, 3 and 5, but these are too small to be used with the best results. Now let us examine 12, 16 and 20. They are even numbers and are divisible by 2,

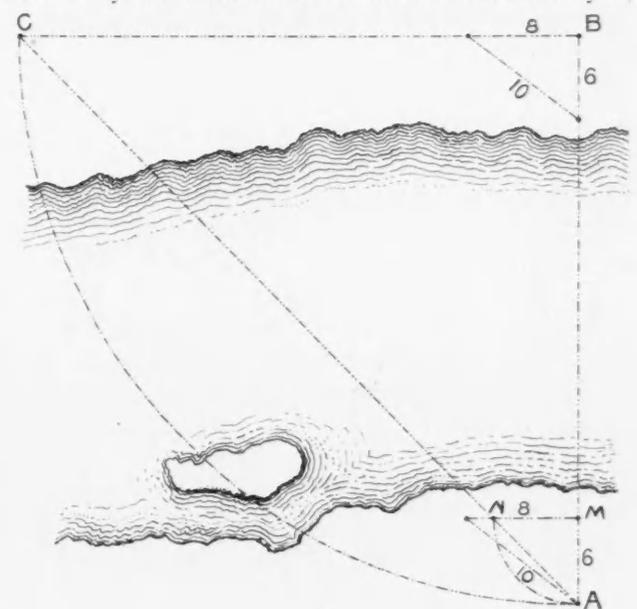


FIG. 241.

viz.: 6, 8 and 10, as shown in Fig. 240. These being convenient lengths and easily remembered, custom has long since settled on these figures.

There are other places that the 6, 8 and 10 rule can be used to advantage. Suppose for some reason we want to know the distance across a body of water. We cannot wade it, neither can we depend on a line stretched across, because when it is re-stretched on an accessible place of measurement, we have no way of determining when it is drawn to the same tension.

Now, referring to Fig. 241, we want to find the distance from A to B. We know that in a right-angled

triangle, whose hypotenuse rests at 45 degrees, the two sides are of equal length. So if we can construct such a triangle, as A B C, the side B C will be the same length as the distance A B, and can be measured for it. Lay off the angle of 6, 8 and 10, at both A and B, as shown. From the stake, M, measure out 6 feet to N, which will be the point to sight to from A, giving the 45-degree hypotenuse to C. With a man sighting from both A and B, a third man sets the

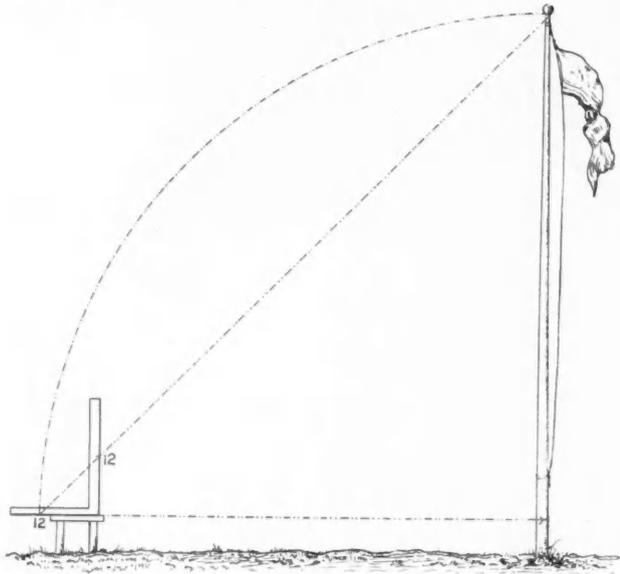


FIG. 242.

stake at C. Then B-C must be the same length as A-B. (The arc is shown in connection with the drawing to prove the accuracy of the work.) Measuring from A and B to the water's edge and subtracting the amounts from B-C will give the width of the water.

Fig. 242 illustrates how a flag pole or other inaccessible height can be measured on the same principle with the aid of a steel square. Take a straight-edge and fasten at any of the equal figures on the tongue and blade. Level and set as shown, and the base line will be equal to the perpendicular distance.

There are many other examples along this line, in the solution of which the principles above described may be employed to advantage; they will readily suggest themselves as the occasion demands.

Short Cuts in Stair Work

Thinking what interests me might interest others—that is, short cuts and simple methods of laying out different kinds of work—I am herewith sending you a rough sketch of my way of laying out strings for a plain, straight flight of stairs. I think it will not require much explanation, as the sketch will show at a glance how I get the lengths and cuts; that is, by using the plumb and level at each end of the string, as shown in Fig. 1, and scribing as at a and b. Then by changing the string end for end it will be found to fit as shown in Fig. 2.

I next find what rise I want; this depends on the

space that I have. If there is sufficient room I like to lay out the steps with 7 or 7½ inch rise. We will consider the height between the floors to be 9 feet 2 inches, or 110 inches. Dividing this by 7, we have 15 5/7 or 15 spaces, and by dividing 110 by 15 will give the exact rise, which is 7 1/3 inches. Since there is plenty of room on the floor for the run, the tread can be made any chosen width. Suppose 9 inches is the desired width. By multiplying 15 by 9 I get the run on the floor, 11 feet 3 inches, at which point it will be seen that I have placed the lower end of the string, as shown in Fig. 1. Then I proceed, as already stated, with plumb and level.

After obtaining these cuts, I next lay the string off into 15 equal spaces with my dividers, and again use

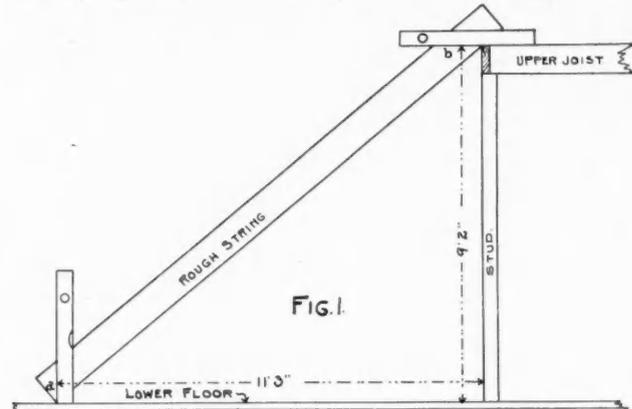


FIG. 1.

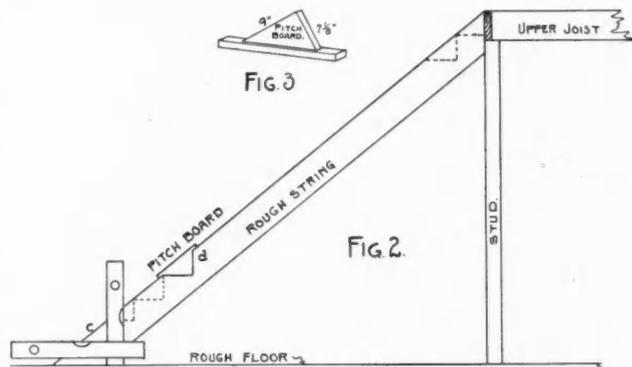


FIG. 2.

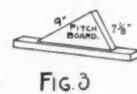


FIG. 3.

the plumb and level in laying off the first notch, as shown at C in Fig. 2. Then I carefully cut this out and use the piece for the pitch board, shown in Fig. 3, from which to lay off the rest of the string, as shown at d. M. A. J.

Device for Lathers

Among the recent inventions is a lath holder which has been invented by two brothers who reside in Colorado. It is designed with the idea of saving lathers from the necessity of stooping over to the floor or platform whenever they want laths. This device is made to fit over the shoulders—the shoulder pieces being padded underneath—and buckle around the body. In the back are two supporting arms capable of holding a bundle of laths and projecting far enough in the rear to be out of the way of the workman.

PRACTICAL CARPENTRY

Diagonal or Horizontal Sheathing—Which?

By Dwight L. Stoddard

WE OFTEN hear it said that to sheathe a house horizontally, makes a bum job, while to put the same lumber on diagonally makes a first-class job; that it is no wonder the balloon frames are being brought into discredit—allowing so much rapid work of horizontal sheathing, etc.

Now I am not condemning diagonal sheathing, never did and never expect to; for if it's well done it makes a good job and in some respects is much better than it would have been if put on horizontally.

Some put it on diagonally at each corner until they come to an opening and then put the rest on horizontally, as in Fig. 1. Some claim that makes a good job, while others claim it makes a very poor one.

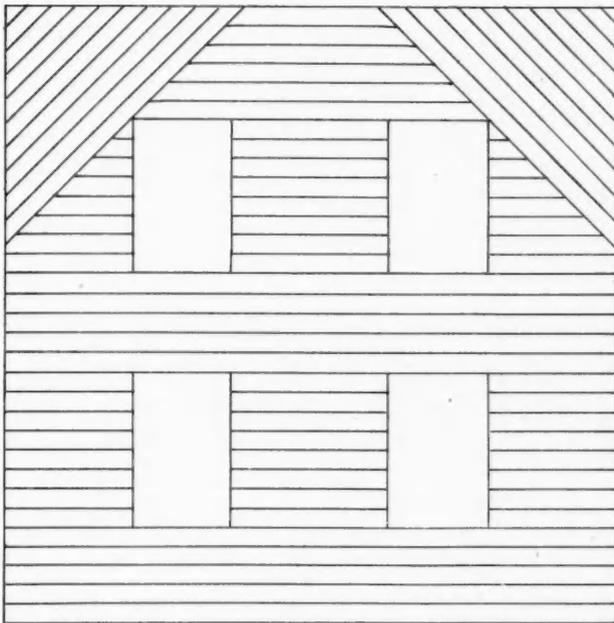


Fig. 1. Horizontal Sheathing—Diagonal at Corners

Now, if bracing the house is what they want, I will admit that this arrangement does it, to some extent at least, though unless the joint is reinforced with a two by four—which I am sorry to say is not often done—it makes a weak and bad job where the diagonal and horizontal work come together.

The real way, as I understand it, is to make both corners braced and then come together in the middle the best you can, similar to the way I have illustrated,

Fig. 2. And yet some might truthfully say that is somewhat of a poor job, as it looks quite weak in the center. I am afraid if anyone should put down a diagonal floor like that he would be called a very poor mechanic indeed. Yet who ever saw one put on diagonal sheathing starting at one bottom corner and

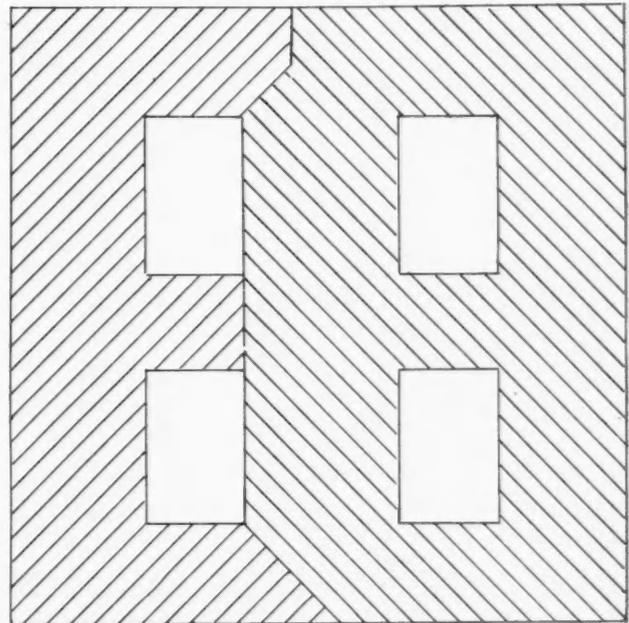


Fig. 2. Suggestion for Diagonal Sheathing

going clear across the side of the house and finishing at the top of the opposite corner, as illustrated in Fig. 3? But unless we put it on that way we cannot make a very good job of it. Yet, after all, is this or any of these styles really much better than the horizontal? Let's stop and consider a few minutes. We say the diagonal is much the stoutest and strongest; will stand more strain than horizontal work; but if so, why is it that we don't build all heavy boxes that way? They have to be knocked around and carry heavy material from one end of the country to the other. Surely they should be built as strong as possible. Yet if you would investigate you would find, I think, a very small number of them that are built diagonally.

Now isn't it a fact that, while the first board put up diagonally forms a brace, after all, if the whole house is nailed together, it matters not which way or how,

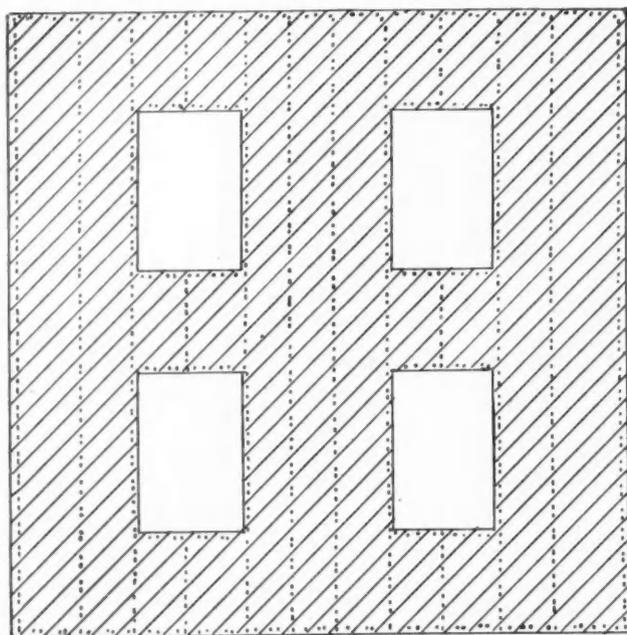


Fig. 3. Diagonal Sheathing—Nailed

it becomes strong, depending mainly on the number of nails that you have put in securely. You will notice, if you will go to the bother of comparing the nails in Figs. 3 and 4, that the diagonal has about fifty nails to each studding, while the horizontal has over seventy. So you see you generally drive more nails and therefore in a way make the horizontal job the best. Again, you are in a better position to do good work, and generally get the work driven closer together when you put it on horizontally; while often, putting it on in a hurry diagonally, you are liable to leave the top end to nail later, and by the time you get to it there are some such big cracks that even if it is diagonal it looks very bad. No, I do not believe there is as much more strength in the diagonal as

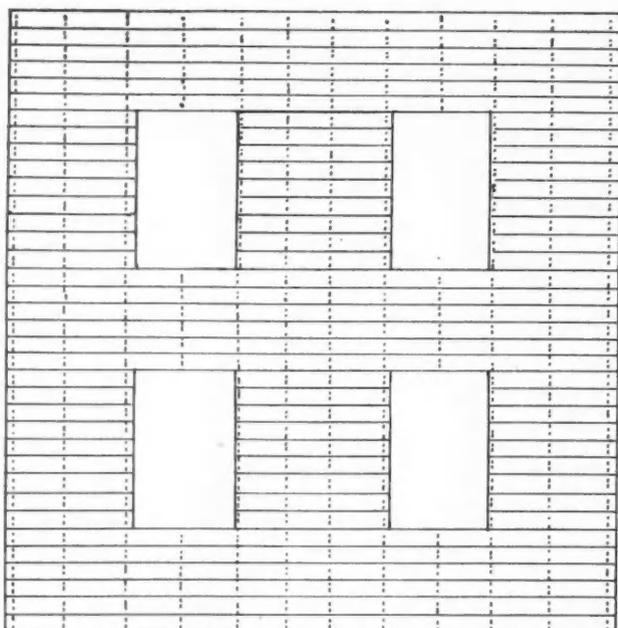


Fig. 4. Horizontal Sheathing—Nailed

many would try to make one believe. In fact, in my whole life as a builder and observer, although I have seen the work of many severe storms, I have never yet

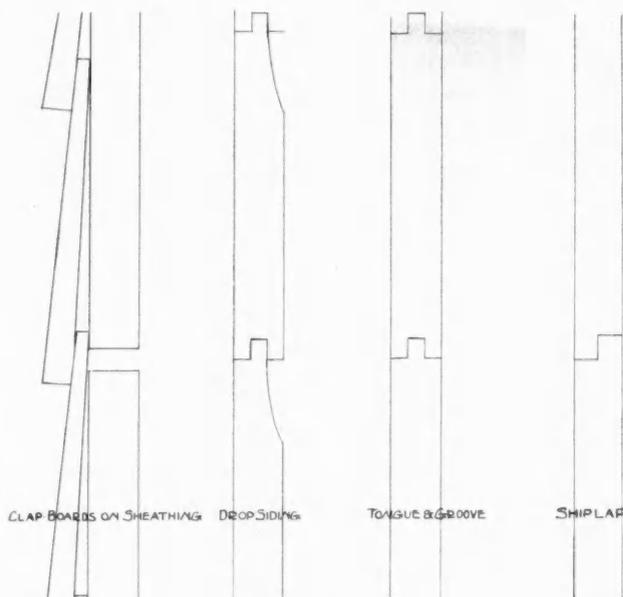


Fig. 5. Common Types of Siding

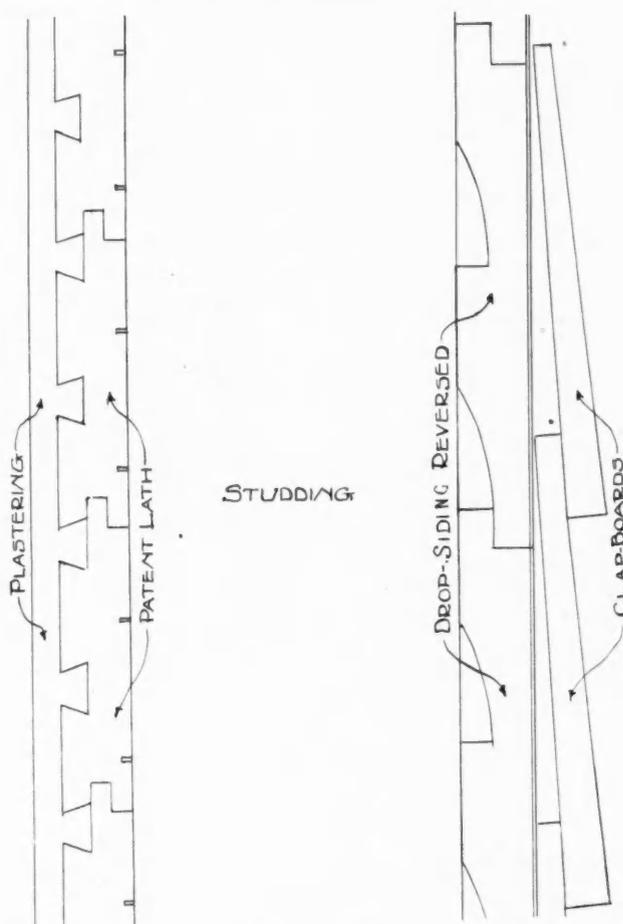


Fig. 6. Wall Section

seen a house blown down because it was horizontally sheathed.

The only advantage I have ever been able to find in diagonal sheathing is in case of wet lumber that

will shrink a great deal, or even in poor lumber that is not all exactly of a thickness. With this the siding goes on over the diagonal and makes a better job. Where the siding is put on before the sheathing has time to dry out and shrinks, as illustrated in Fig. 5, it not only makes the siding show where it draws away from the paint, if the paint is put on as it often is in these days of rapidity before the shrinkage has taken place, but sometimes it even splits the siding from one end to the other. Of course that is only in very rare cases, and when it happens it surely is a bum job indeed. In fact, any house that is sheathed with wet lumber, or even common sheathing, is a bum job any way you put it on. The little difference in the expense of making a good job by putting on dry matched lumber is so small that no one can afford to sheathe a house with common sheathing any way.

Some would try to make you believe that horizontal sheathing is so poor that the house will hardly stand if built that way, yet if these same people were going to build and not put on any sheathing at all they would not expect you to put on the siding, be it beveled or

drop siding, diagonally. Common 6-inch flooring, or even 8-inch shiplap, makes a good lining for a house; and, if well put on, even horizontally, is a better job than common sheathing, I care not how it is put on.

When I built the house I am living in now the yard where I got my lumber did not have any shiplap at the time, so they sent me drop siding. By putting it on inside out, putting on paper and then siding it on the outside, and with patent lath and good plaster on the inside, as shown in Fig. 6, I made a good job of it. From without there is no way of knowing that the lining was put on horizontally, and it can not be told on the inside either, for the plaster stands there perfect—the walls are tinted and show the plastering perfectly; there is no white coat or paper to cover up the real plastering itself, which has stood there for years to prove that the horizontal lining was not so very bad after all. My own house, and many that I have built for others, show me that there are many other things that make a bum job of a house, far more than whether the sheathing is diagonal or horizontal.

Mechanic's Tool Chest of Novel Design

A TOOL CHEST RATHER OUT OF THE ORDINARY IN DESIGN, BUT POSSESSING MANY DESIRABLE FEATURES—HOW IT IS MADE—SIZES OF STOCK REQUIRED

By I. G. Bayley

THIS chest is different in several ways from the kind we are used to seeing in the mechanic's workshop, the most novel feature being the drop front. To make the chest the following material will be required, made from one-inch stuff, planed down to seven-eighths:

Two pieces $13\frac{1}{2}$ by 33 inches—top and bottom.

One piece 12 by $31\frac{1}{4}$ inches—front.

One piece 12 by 33 inches—back.

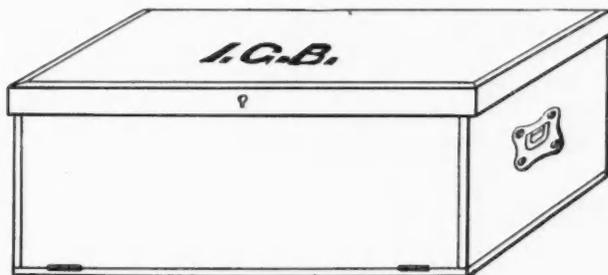
Two pieces 12 by $13\frac{1}{2}$ inches—ends.

One piece $2\frac{1}{4}$ by 35 inches—front rim.

Two pieces $2\frac{1}{4}$ by $14\frac{1}{2}$ inches—side rims.

The back and two sides are mitered, as also are the rims; otherwise the material will be a little different in length.

The nail box and nest of drawers and the tool rack



can be made of spare material and the general design changed to suit the whim of each individual's taste.

The nest of drawers can be a discarded sewing machine set or made to order.

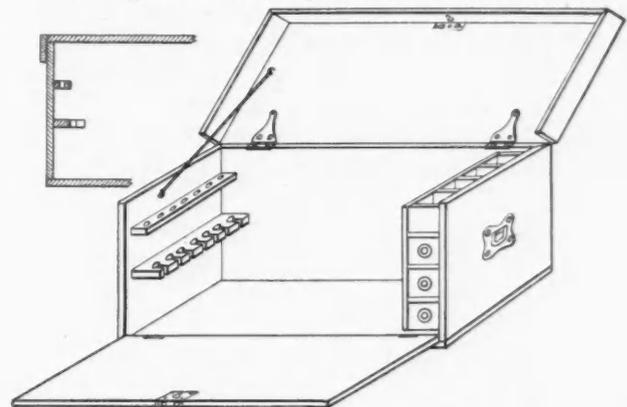
The tool racks are placed one above the other, the top one being for small tools, the lower one being

for chisels, and such like, slots being cut to allow of their being put in place.

The lower rack is wider than the other, to enable the chisels, etc., being dropped into place.

The nest of drawers and the tool rack are set back one inch, or the thickness of the front, allowing it to close up flush.

The hinges should be placed on the inside, other-



wise there will be little use for the lock and key. The keyhole is cut through the rim and front, as indicated.

A cord or wire should be connected to staples, or screw eyes, in the lid and the inside of the chest, to prevent the former falling too far back.

Care must be taken to set the screw eyes in the lid far enough back to miss the top of the chest when closed.

The whole can be stained or varnished and the initials of the mechanic placed upon the lid.

Flush drop handles are secured to the sides.



How to Make an Arm Chair and Table

COMPLETE DETAILED DESCRIPTION WITH WORKING DRAWINGS SHOWING HOW TO MAKE TWO VERY DESIRABLE PIECES OF LIBRARY FURNITURE

THE chair, Fig. 1, is of very substantial design and construction, as is also the table, Fig. 2.

We have chosen to give all the important dimensions so that the amateur as well as the experienced furniture designer may not be placed at a disadvantage when he begins to work. Nothing is more exasperating and discouraging to a worker than to find that some important dimension has been omitted so that he must hazard a guess as to what it ought to be. Experience has probably shown him that a variation of an inch or oftentimes even a fraction of an inch means the change of the appearance of a proportion of a design, generally for the worse, inasmuch as the original designer has usually given considerable study to his proportions. He would much prefer to

and sand-papered on four surfaces to the sizes specified below.

Plain sawed red oak will finish nicely and is very appropriate for a mission design and finish. Quarter-sawed white oak makes a rich appearance.

The stock bill for the chair is as follows: Width and thickness are specified exact, except rear posts; but to the lengths enough surplus has been added to allow for squaring the ends.



Thick, Wide, Long,
In. In. In.

Front posts 2 pieces	1 3/4	1 3/4	27
Back posts 1 piece	6 1/2	1 3/4	38
Front horizontal . 1 piece	3/4	2 1/2	20 3/4
Front horizontal . 1 piece	5/8	3 1/2	20 3/4
Back horizontal . 1 piece	3/4	4 1/2	20 1/2
Back horizontal . 1 piece	3/4	2	20 1/2
Back horizontal . 1 piece	3/4	2 1/2	19 3/4
Back horizontal . 1 piece	5/8	3 1/2	19 3/4
Side horizontal . . 2 pieces	3/4	2 1/2	17 1/4
Side horizontal . . 2 pieces	3/4	2 1/4	17 1/8
Side horizontal . . 2 pieces	3/4	2 1/4	17 1/2
Back slats 5 pieces	3/8	2 1/4	12 1/4
Arms 2 pieces	7/8	4 1/2	20
Braces 2 pieces	1 1/8	2 1/4	6 1/2
Braces 4 pieces	7/8	3	3

Begin work on the posts first. The front posts should have one end of each squared, after which they can be cut to exact length. It will be noticed that there is a tenon on the upper end of each which is to extend slightly above the top surface of the arm, to which it is to be pinned from the inside with a 3/8-inch wooden dowel.

The rear posts, according to the stock bill, are specified for the exact width. By exercising forethought both may be got from the piece ordered.

The tops and bottoms of these posts should have their edges slightly chamfered to prevent their slivering.

The shape of the arm is a little out of the ordinary but the drawing indicates quite clearly what it is to be. It is fastened to the rear post by means of dowels and glue after the other parts have been put together.

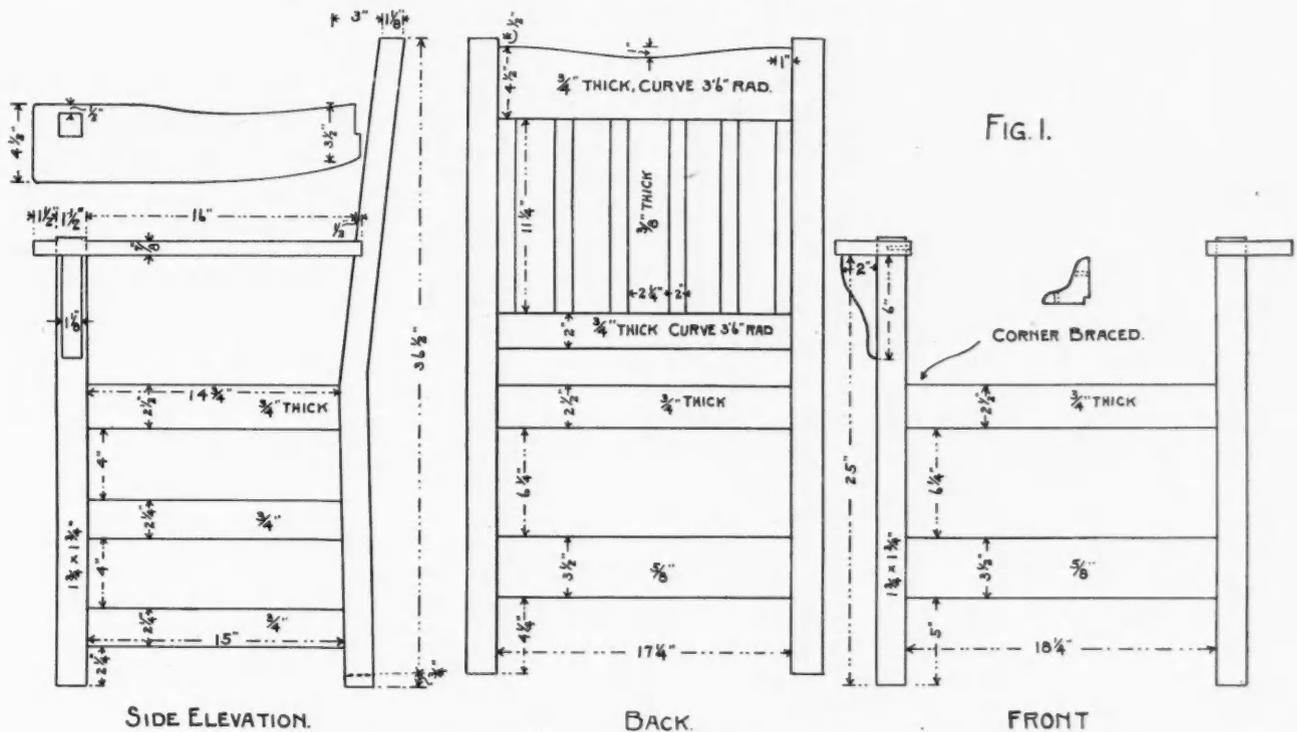
Next prepare the curved parts of the back. These parts are worked to size, after which they are placed in a box and thoroughly steamed.

have this uncertainty removed by seeing sure figures for the parts. We have aimed to accommodate him.

In furniture construction such as this, nothing is gained by trying to plane up the stock out of the rough. This is mere drudgery and can be more cheaply and easily done at the mill on the mill's machines. There will be plenty to do to cut and fit all of the different parts. Order the pieces mill-planed

If nothing better is at hand, nail four boards together and close one end, leaving room for the end of a rubber hose to enter. Place the boards in the

Along the side of the rails and near the bottom a row of ornamental headed nails will give an added touch of permanency.



box, stuff rags in the other end and connect the hose with the spout of a boiling tea kettle.

When the wood is pliable take out the pieces and clamp them to a curved form, previously prepared, which shall have a surface curve of 3 feet 6 inches radius. While these are "setting" go ahead with the laying out of the mortises and tenons of posts and rails.

Inasmuch as the width of the front exceeds that of the back by 1 inch, allowance must be made for "slant" either in the tenons of the side rails or in their mortises.

It will also be noted that the top side rail is 1/4 inch shorter than bottom side rail, which means that the shoulders of the tenon entering the back post must be laid off with bevel and not try-square.

Put the back and front together and when the glue on them has dried put the side rails in place and then the arms.

The frame is stiffened by fastening with screws four braces to the inside of the seat, one at each post.

The brackets under the arms are to be doweled and glued fast to posts and arms.

The surplus glue should now be scraped off and any irregularities scraped and sanded smooth.

The chair is now ready for whatever finish is to be applied.

The seat for this chair is made as follows: First stretch over and around the seat rails and tack on their under side, a canvas. On this cross weave and fasten underneath upholsterer's webbing. On this place a stuffing of hair or elastic felt. A piece of muslin draws this in place, and on top of the muslin comes the final covering of Spanish leather.

The table we describe this month is rather out of the ordinary, and for that reason will appeal strongly to some, while to others it may seem too great a

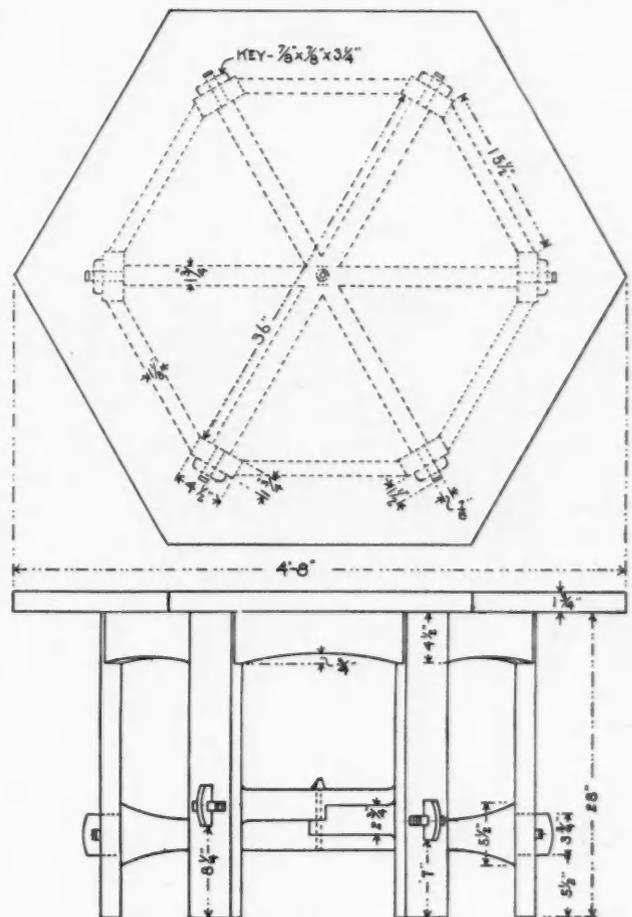


FIG. 2.

departure from the conventional. To the latter we shall offer a more conventional table in another number. Personally, an unconventional piece of furniture make an effective appeal, provided, of course, that it have merit and does not partake of the bizarre.

The stock bill for the table is as follows:

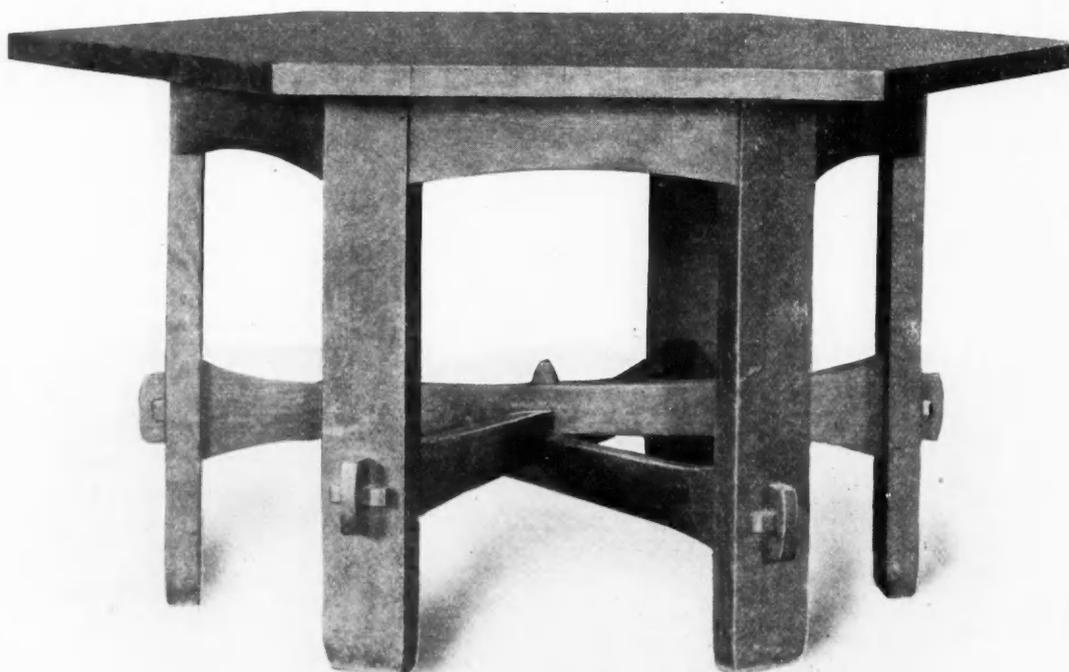
	Thick,	Wide,	Long,
	In.	In.	In.
Top	1 3/4	51	60
Legs	1 3/4	4 1/2	29
Stretcher	1 3/4	5 1/2	44
Rails	1 1/8	4 1/2	16 1/2
Keys	7/8	7/8	3 1/4

All pieces will be mill-planed and sanded on four surfaces.

1 1/2 inches up the sides. The mortises necessitate working the legs in pairs.

Next work the tenons on the stretchers and shape them as shown in the drawing. The joints where the stretchers cross are made by cutting one-fourth the width out of top and bottom stretchers and one-fourth out of each side of the middle one. The angle at which to set the bevel is the same as that of the hexagonal top. The angle for the top rails, too, can be obtained from a line connecting the corners of the top, together with a side. The exact length of these top rails can be got by locating the positions of the posts in pencil on the under side of the top, then measuring the distance between.

These rails are to be doweled and glued to the posts



It will be seen by the accompanying drawing that the top is hexagonal or six-sided. To lay out the sides of this hexagon, drive two brads in a stick so that they shall be 2 feet 4 inches apart. With this "strike" put on a circle—or those parts of a circle which will go on—placing one of the brads at the center of the board. With this same strike, begin on the circle at the end grain of the wood and mark off, on the circle, points for chords that shall equal the radius of the circle. Connect these six points and the hexagon is formed.

Of course, a hexagon could be formed by beginning to mark off at any point on the circle, but by beginning at that part which is near the end grain none of the corners have grain running across them in such a way as to make them likely to break off.

First shape the six legs. The lower ends are rounded off about 1/4 inch back on the bottom and

and the top fastened to them by means of two small angle irons to each rail.

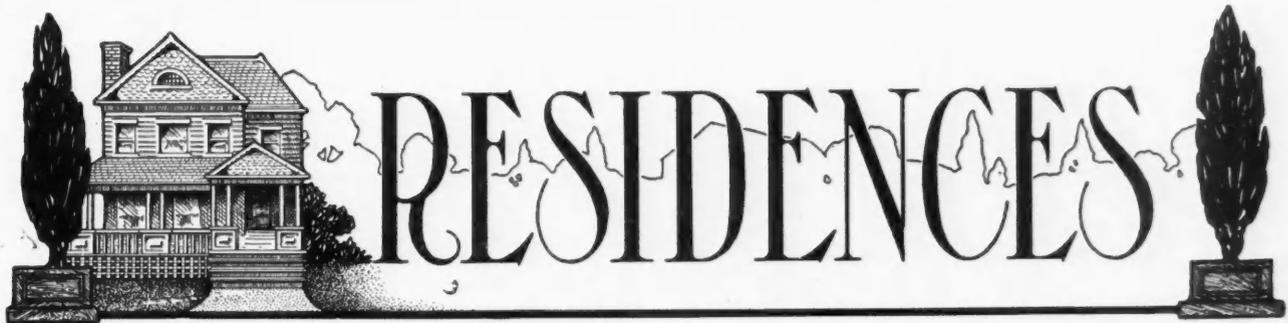
The pin for the center cross of the stretchers is of 1/2-inch diameter with a top shaped square or hexagonal as desired.



Some Stack This

Great Falls, Mont., has the distinction of having the highest concrete smokestack in the world, even though the work was done by a German firm. The stack is 506 feet in height, and weighs 34,000,000 pounds, or 17,000 tons. It rests on a concrete foundation 25 feet deep and 103 feet in diameter. The diameter of the stack at the base is 78 feet 6 inches, and at the top 53 feet.

The stack is also claimed to be the largest piece of concrete masonry of any kind ever constructed.



RESIDENCES

Bungalow and Cottage Designs

PERSPECTIVES WITH FLOOR PLANS OF FOUR PRACTICAL YET ARTISTIC BUNGALOWS, SELECTED AS BEING TYPICAL OF THE LATEST BUNGALOW DESIGNS

EVERY sign and indication of the building season now begun points to a continuation and an increase of the popularity of the bungalow style of house building. The bungalow idea, originating in

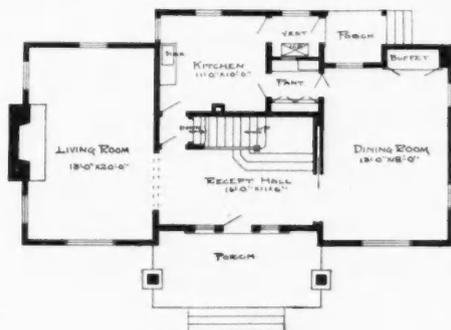
informed, regarded it merely as a fad and thought it could not last; others considered the bungalow as sort of a "rich man's" toy, or as suited only for summer use; others thought the style pretty but impractical.



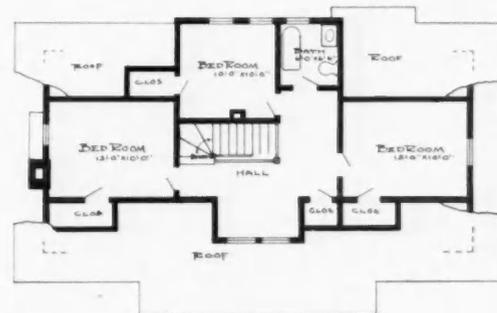
A Very Attractive Story-and-a-Half Bungalow of Six Rooms—Estimated Cost, \$2,300

southern California, developed with such marvelous rapidity that a good many builders, not being fully

These false notions seem now to be pretty generally dispelled. The original California bungalow idea,



First Floor Plan



Second Floor Plan

acting as a leaven or ferment, has aroused the whole family of architects and house planners all over the country to study anew the problems of designing and arranging the smallish residence to the best advantage. The result has been that the old-time conventional lay-out—which had been handed down from father to son without thought since “before the war”—suddenly found itself out of favor. The progressive architects of every locality, north, west and east, bestirred themselves to adapt the southern bungalow to the conditions of their climate.

A large number of very notable designs have been

on one floor. That is not necessarily so, although a great many, perhaps the majority, are of the cottage type. This design embodies the best bungalow features both as to exterior appearance and interior arrangement, yet three nice bed rooms with closets and bath room are provided for on the second floor—under the roof. The cost is estimated at \$2,300, but would doubtless run a little more than that in a good many localities.

A Summer Bungalow

Located on a slightly elevated site, sheltered by the trees and rising land in back, a picturesque setting is



A Summer Bungalow by the Lake

produced, designs which in outward appearance and in atmosphere are in perfect accord with the spirit of the California bungalows, yet which are thoroughly practical and substantial for permanent residence in northern climates.

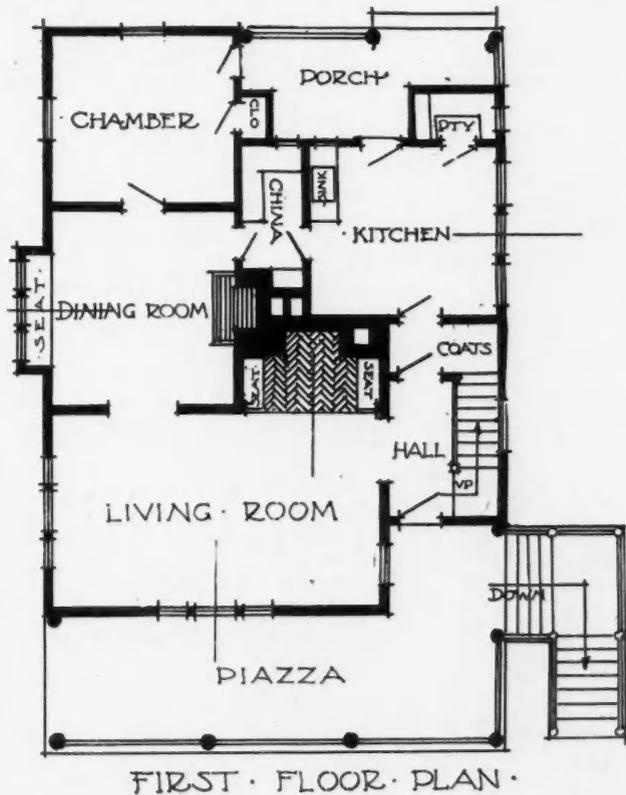
The first design, that shown on the preceding page, is one of these. A glance at the floor plans will show the very commodious, convenient arrangement of rooms on the first floor. It would be difficult to imagine a residence of this size that would be any more homelike than this.

Some have considered that a bungalow must be all

given this bungalow. From the broad piazza a fine view is obtained of lake and hillside. Inside a small hall leads direct to the kitchen. On the left a large living room is placed. The dining room just beyond has close connections with the kitchen, facilitating the household duties. One chimney is made to serve the whole house, giving a fine large fireplace in the living room, with a cozy seat at each side slightly recessed. A smaller fireplace in the dining room would remove the chill for the morning meal in the fall or early spring. An extra chamber or studio adjoins the dining room and opens onto the rear porch.

Spacious and economical, this plan would meet the requirements of an all-the-year-round house. The floors are of hard pine and the walls are sheathed in hard pine, matched and beaded, stained a Mission brown. A beamed ceiling is formed by permitting the second floor joist to be exposed, chamfered and stained same color as the walls.

The second floor contains four good chambers, closets and bath room. A tank above the second floor ceiling beams collects and filters the rain water into



the pipes for the bath room. Of course, at some seasons of the year other provisions will have to be made. The floors above are spruce and the walls are sheathed, same as in the first story. The exterior walls of first story are of 10-inch lapped cypress-placed directly on the 2 by 4 studding. Cedar logs are peeled and used for the piazza posts and a rustic balustrade formed between. The foundation is formed of cedar posts, about 6 or 8 feet apart. A shingled roof and brick chimney to top off with completes the bungalow.

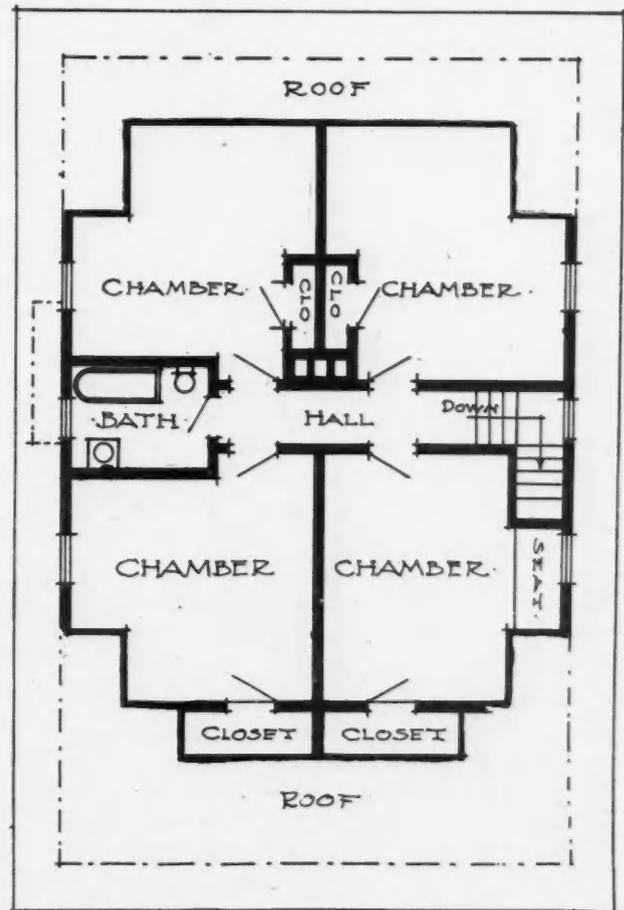
A Comfortable Six-room House

Although it may not be evident at first glance, the stimulating effects of the bungalow idea are to be found in the house design on the next page. The exterior has escaped, retaining the simple, conservative lines that are always satisfactory, and that will always remain to a certain extent popular. Within, however, the house has been modeled on the modern lines of the bungalow awakening. The size and shape of the rooms and the absence of partitions is the keynote of this. The architect, A. W. Woods, of Lincoln, Neb., is to be congratulated on the many desirable features

of the design. Three rooms are provided on the first floor; three bed rooms with closets and bath on the second.

An Artistic Six-room Bungalow

The design shown in connection with this on page 56 has been selected as being typical of the very best modern thought in bungalow planning. It is a bungalow of the larger size—six rooms besides hall and bath—yet it is all on one floor and all parts of it are well lighted. The arrangement secures for the three bed rooms a maximum degree of privacy. The kitchen and dining room are arranged for convenience in serving. The paneled ceiling in the forepart of the house is a



special feature. The cost of this artistic and satisfactory bungalow is estimated from \$2,800 to \$3,000.

The editor desires to call attention to a slight error made in this department of the March number in the printing of the perspective of the Colonial house design, page 634. Probably most of the readers have noticed it, that the perspective is shown reversed and so does not fit the floor plans. This is a good example of what every builder knows—that some details do go wrong, sometimes, in spite of eternal vigilance! The seemingly trivial act in the process of engraving the half-tone plate of turning over the glass plate before applying it to the sensitized copper caused all the trouble.

A Classic

"When I get to heaven I am going to ask Shakespeare whether or not he wrote those plays."

The husband chuckled.

"Maybe he won't be there," he said.

"Then you ask him," said the lady.



A Word to Plumbers

The journeyman plumber sometimes prides himself in dodging the regulations because in doing so he fools the inspector. In doing this he makes several

he filled up the hub until a thin ring of lead filled the hub approximately flush. This took rather more time than putting in the ordinary quantity of oakum. The thin ring of lead required very careful caulking and sometimes had to be taken out and poured a second time. But in the end he effected a saving of 1, 2 or 3 pounds of lead, according to the size of the joint. This gave him great satisfaction.

On one occasion where work of this kind had been done it was brought to the attention of the boss plumber who happened to be of the type known as a "skin." He had no love for inspectors or rules, but



A Comfortable and Satisfactory Six-Room House

mistakes. The regulations in regard to the weight of pipe, methods of making joints, repairing leaky and cracked pipes, and many other things relating to practical details of work, were all made by practical men, by experienced plumbers who were first-class. The rules were formed so as to insure first-class work, and as they were making the rules for themselves they did not make them in such a way as to increase the cost of workmanship.

In olden times, when plumbing rules were new, the journeyman said to himself that there was no reason for putting $\frac{3}{4}$ -pound of lead per inch diameter into the hub of an extra heavy pipe, so with some old newspapers in the bottom and oakum on top of that,

he remarked in regard to the work: "Didn't the fool know that while he was saving 12 cents worth of lead he wasted 25 cents worth of time?" There are a great many such economies in plumbing. Savings can be made in the expenditure of material, but they cost more than they are worth. With a thin ring of lead, unless unusual care has been taken with the oakum, the lead will sink in places, being driven down before it expands so as to fill the joints. Where a line is subject to a water test, a few such joints will cost perhaps twice as much in time as if it had been made in the regulation way.

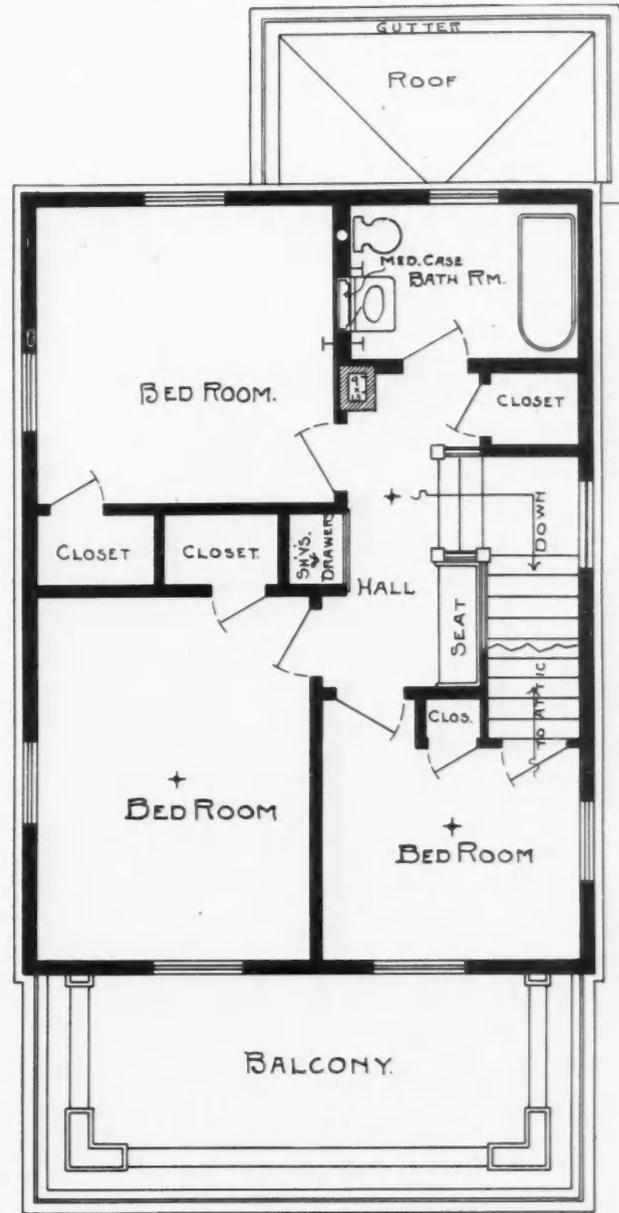
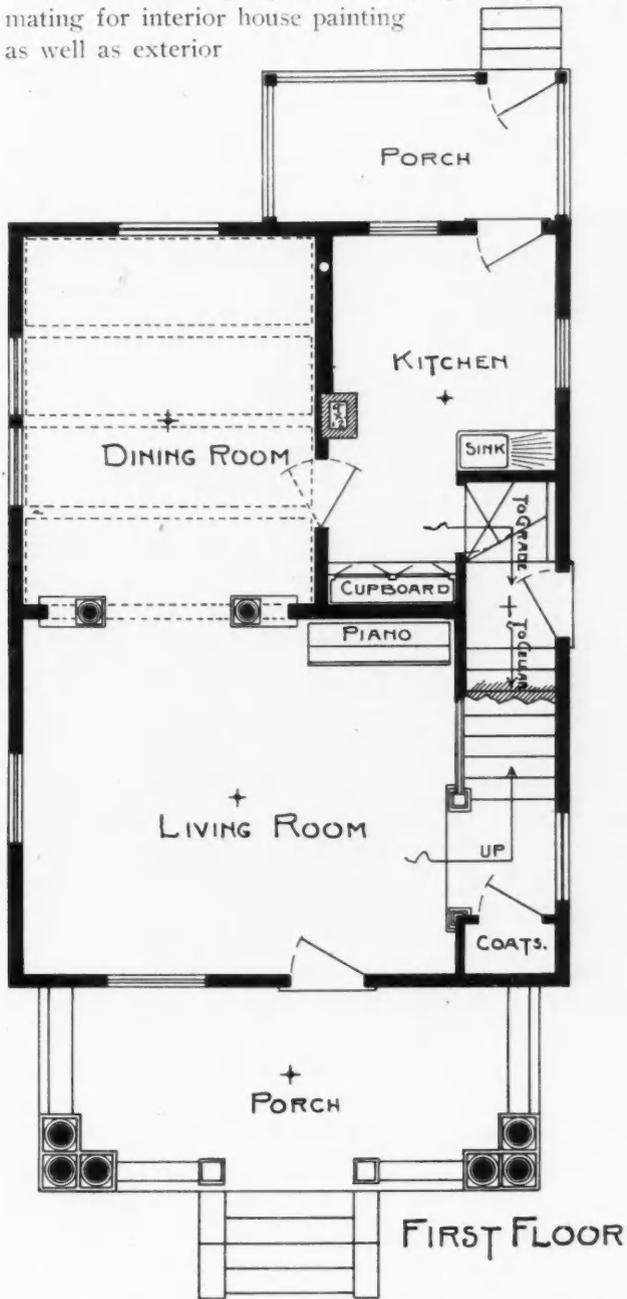
Cracked lengths, cracked hubs, blow-holes that cannot be plugged, and other similar defects are often

put in place with the hope of getting them passed by the inspector. If they are found, the usual song is, "We didn't see them," or "We hadn't noticed them." Such an answer would pass muster if the blow-holes were not always carefully turned so as to bring them out of sight. It is far better for the master plumber frankly to condemn such a pipe and refuse to put it into the job than it is to run the risk of having to take the defective pieces out.

any deductions for windows and doors. Figure on square yards of surface and set your price accordingly. If the rooms are papered, and only the woodwork is to be painted, measure the base boards, window

Estimating Interior and Exterior Painting

In answer to a query as to the proper way of estimating for interior house painting as well as exterior



SECOND FLOOR

work on frame buildings and on painting and lining brick fronts, the *Painters' Magazine* lays down the following principles:

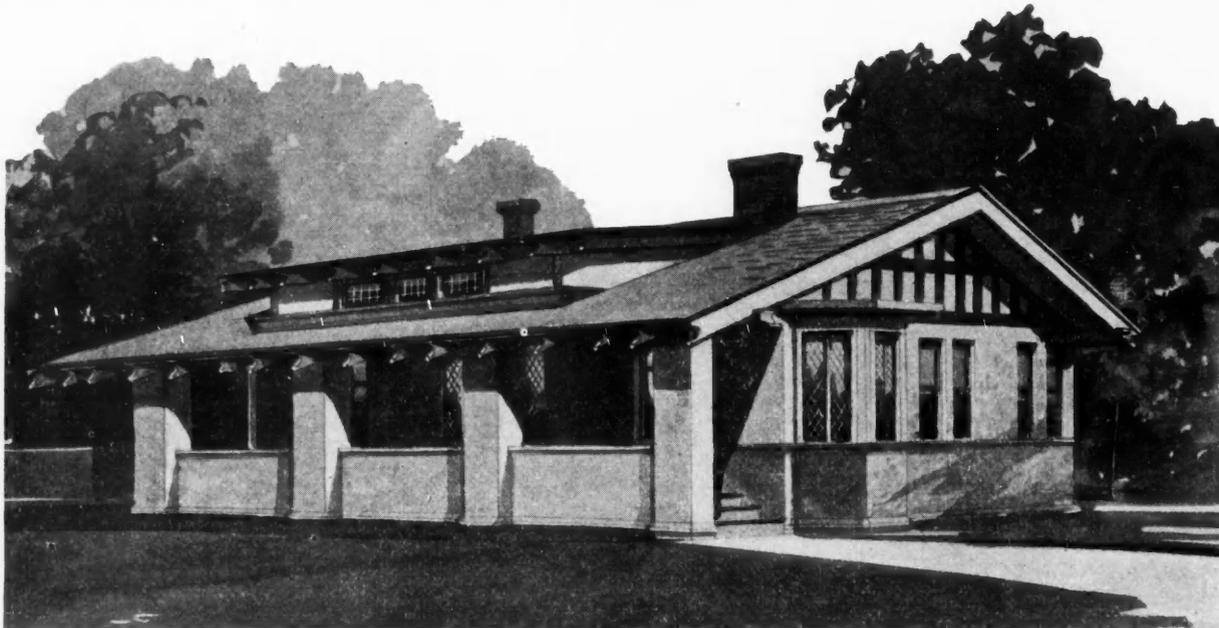
On interior work measure the size of the rooms, if walls and ceilings are to be painted, but do not make

frames, doors and door frames, and figure the sash as if solid. For interior work on walls and ceiling, new work, three coats; the price should not be less than 30 cents per square yard; for old work, two coats, 24 cents. If only the woodwork is to be painted, new work, three coats, 35 cents to 40 cents per yard, while on old work, two coats, 28 to 32 cents will be none too much, according to condition of surface. For outside work, use the tape line and measure carefully the cornices, moldings, etc., following hollows, rounds and edges. Add 20 per cent for ordinary weatherboarding and edges of door and window frames. Also make allowance for parts difficult to reach. Prices should be figured as follows:

New work, one coat, per square yard, 10 to 12 cents.

New work, two coats, per square yard, 22 cents.
 New work, three coats, per square yard, 28 cents.
 Old work, one coat, per square yard, 15 to 18 cents.
 Old work, two coats, per square yard, 22 to 25 cents.

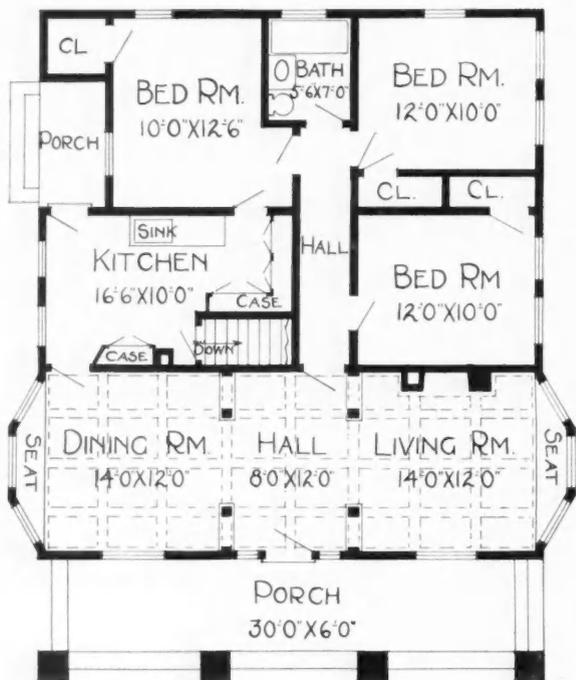
ful to test the old paint, no matter how well and solid it may look, because it very often happens that the old paint is loose from lack of binder in the original priming, and the new paint, on drying in contracting,



Artistic Bungalow of Six Rooms—Estimated Cost, \$2,800

Brick walls, new, three coats, per square yard, 28 to 35 cents.
 Brick walls, old, two coats, per square yard, 20 to 30 cents.
 Brick penciling, per square yard, 12 to 15 cents.

loosens the old coating, causing scaling, and then the new paint is blamed for the trouble. When the old paint has cracked, scaled or blistered, take this into consideration and figure on its removal. Also examine window sash to see how the putty is, and blind slats to see whether they are stuck fast and difficult to paint.



Floor Plan

Where scaffolding is necessary, or the work is otherwise difficult of reach, or where color of higher cost than the ordinary is in demand, you must exercise your own judgment in figuring the extra time and expense. Also in the case of repainting be very care-

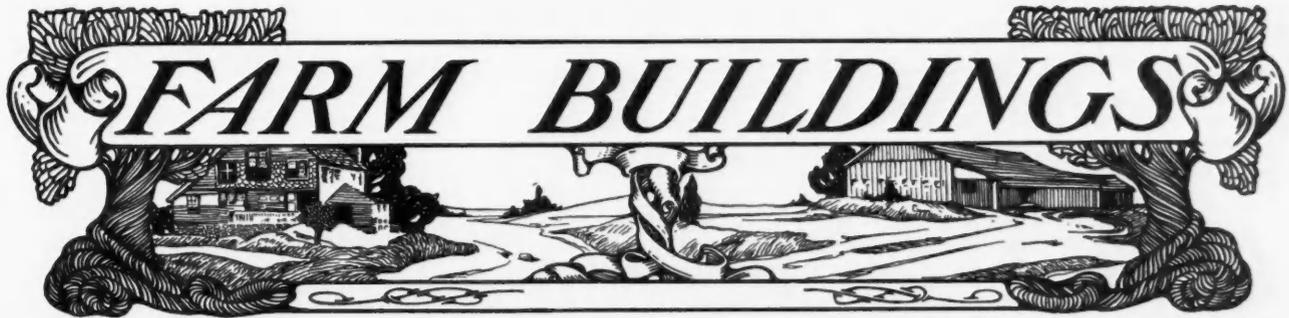
Cost to Rebuild the Pyramids

In a paper read by Mr. E. S. Wheeler, at a recent meeting of the Society of Engineers, an interesting calculation was made as to what it would cost today to duplicate the Great Pyramid of Gizeh.

This structure, one of the wonders of the world, is founded on solid rock at a depth of about 120 feet below surface level, and rises to a height of 454 feet. Its base covers an area of almost fifteen acres.

Mr. Wheeler's scheme for the reproduction of this pyramid contemplates, first, the setting of a base of concrete. This would represent about 2,600,000 cubic yards of material, and would cost at least \$10,000,000. The estimate for the superstructure is about \$38,000,000, and it would contain 3,313,000 cubic yards of backing stone and 142,000 cubic yards of facing stone. Mr. Wheeler's estimate of labor is 24,000,000 days.

These figures are cited to show the great engineering skill of the Egyptians, and the fact that no task in construction appeared to be too large for a people whose extant monuments showed their patience and ability to overcome obstacles that would daunt even the modern engineer.

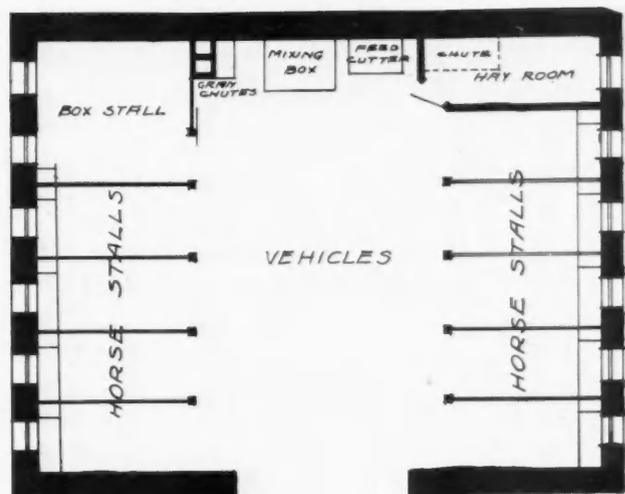
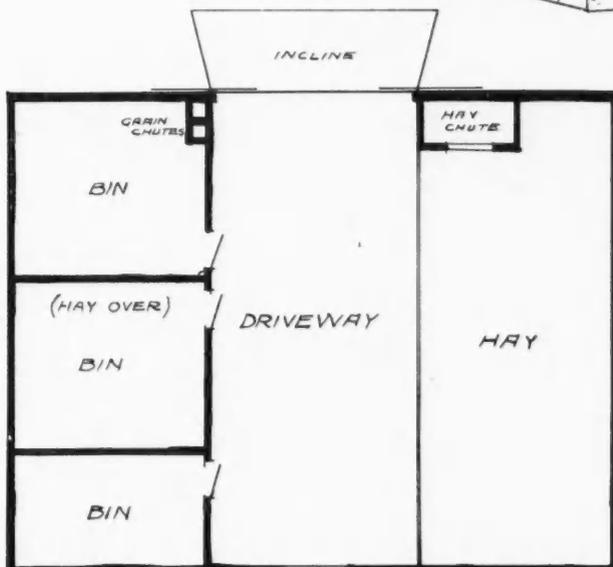
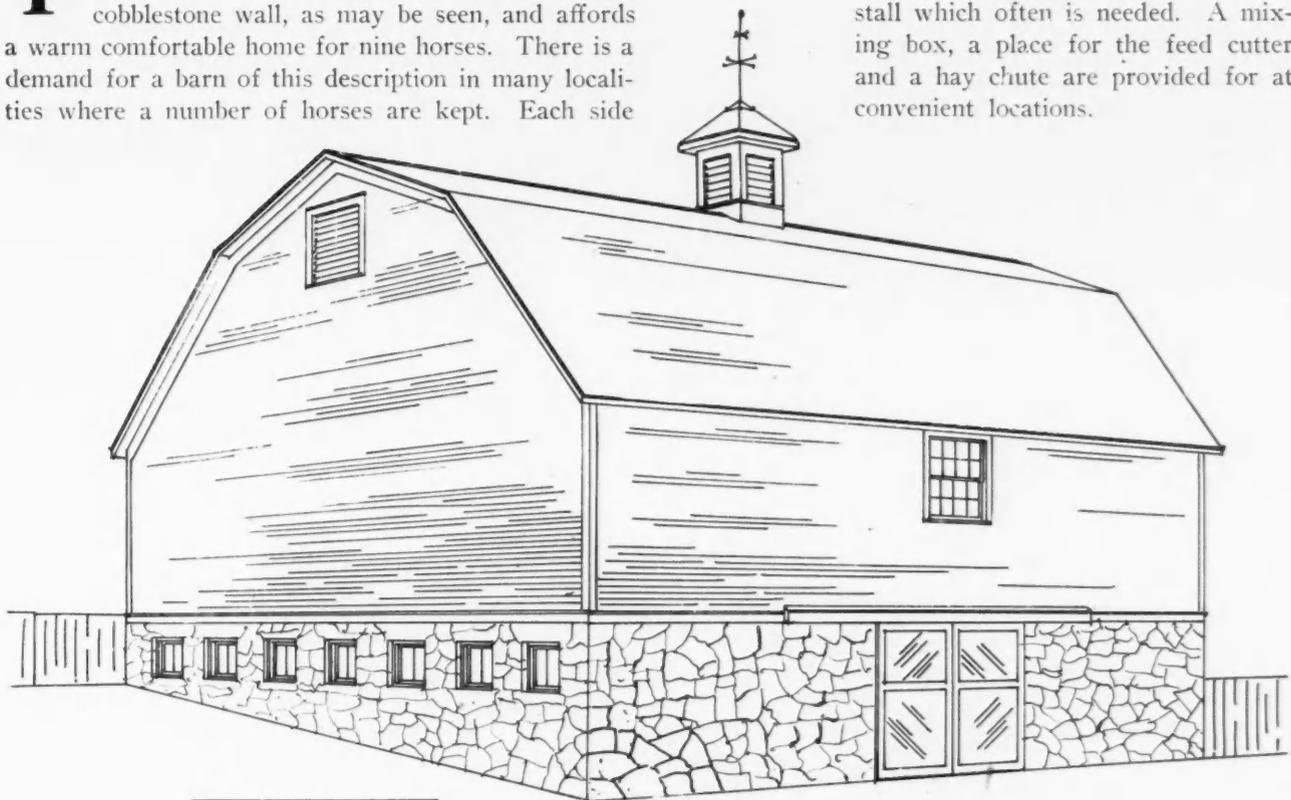


A Desirable Horse Barn

PERSPECTIVE AND FLOOR PLANS OF A VERY CONVENIENTLY ARRANGED BARN, DESIGNED TO HOUSE NINE HORSES—DESIRABLE FEATURES MENTIONED

THE barn shown in this connection is designed for the exclusive use of horses. It has a heavy cobblestone wall, as may be seen, and affords a warm comfortable home for nine horses. There is a demand for a barn of this description in many localities where a number of horses are kept. Each side

of the entrance on the ground floor the stalls are arranged, and at one corner is a box stall which often is needed. A mixing box, a place for the feed cutter and a hay chute are provided for at convenient locations.



Sewage Disposal by Septic Tank

A DISCUSSION OF THE SEPTIC TANK METHOD OF SEWAGE PURIFICATION—HOW TO CONSTRUCT A SMALL SYSTEM FOR A DWELLING HOUSE

By T. B. Kidner

A SUBSCRIBER to this magazine, Mr. W. H. Benson, of Laingsbury, Mich., has written asking for the details and particulars of the construction of a septic tank for his dwelling house. He says, "I have read your article on drainage in the February number with much interest. We have no sewage system in this village and I want to ask your advice in constructing a septic tank, and also to ask if they are perfectly sanitary. I have never seen a working drawing of a septic tank except in a farm paper, and although it looked O. K., I would not want to make an experiment on that authority. The drain from my cellar is a 6-inch tile and has a fall of not over 4 inches in 15 feet, so I would not think it fell enough to put in an ordinary closet."

The question of sanitation is very much to the front today and is becoming of increasing importance everywhere as the population becomes greater. In fact, this magazine believes it to be one of the three most essential things to be considered in building; namely, light, air and good drainage. In our larger cities and towns, sanitation is, of course, in the hands of experts who have made a life-long study of the matter, but the small towns and villages are also rapidly becoming alive to the serious menace to the health of the individual, and of the community, arising from a neglect of sanitary precautions. Thousands of houses over the land, tastefully designed, well built and beautifully furnished, are marred by primitive sanitary arrangements such as outdoor privies over a common half open cesspool. This is a condition which it is largely in the hands of the readers of the *AMERICAN CARPENTER AND BUILDER* to improve and one of the best remedies is the installation of a septic-tank system about which this correspondent inquires.

The word "septic" is taken from a Greek word meaning to putrefy or cause putrefaction, and a septic tank is one in which the sewage is allowed to putrefy by means of minute organisms or germs which are contained in the sewage itself. The septic tank system aims to encourage the growth of these organisms, which multiply with extraordinary rapidity under favorable conditions, and soon consume all the dangerous portions of the sewage, themselves included. Some harmless liquid and solid portions remain; the liquid being allowed to run into a stream or soak away into the land, and the solid matter, termed "sludge," left behind, can be carted onto waste land without causing any nuisance to the surrounding country.

The credit of devising the system belongs to the city surveyor of Exeter, England, an inland town situated on the banks of the river Exe which was being ruined for fishing, boating, etc., by the discharge of the city's crude, untreated sewage into it. In the

Exeter system, the first stage of treatment consists of a closed chamber, partially filled with large stones through which the sewage slowly passes. The spaces between the stones form dwelling places for colonies of myriads of germs which attach the sewage during its passage through the chamber and hasten the action of the putrefactive organic matter in the sewage. The effect of complete putrefaction is to liquefy this organic matter and to precipitate the harmless solid portions to the bottom of the chamber, or upon screens provided for the purpose. All the work of this stage can go on in a closed chamber, as the germs necessary to putrefaction can exist without oxygen; or, as the biological chemist would say, they are "anaerobic."

The second stage consists of the purifying of the liquid effluent by another set of germs which are termed by the scientists "aerobic"; that is, they require oxygen to live. This is accomplished by means of a series of filters arranged on an intermittent plan. These filters are, usually, simply shallow tanks arranged one above the other in series, the liquid overflows from tank to tank in a heavy dropping rain; the edge of each tank forming a sort of weir. The liquid thus comes into thorough contact with the air and the purifying organisms or germs are enabled to deal with it in a very favorable form. The liquid finally resulting is quite free from organic matter, being mineralized by the action of these useful organisms, and may be run into a stream or outfall with perfect safety.

This is, in brief, the whole system, but it will be evident that the plant for a large town would need considerable attention continually. The city of Exeter, mentioned above as being the pioneer in this method of sewage treatment, has over fifty thousand inhabitants and the plan adopted there was to construct several large tanks; each one capable of holding one day's crude sewage from the city. In each tank are quantities of loose stones among which the liquefying organisms may form their colonies. As soon as a tank is filled, the supply of crude sewage from the city sewers is turned into another tank and, after a suitable time has elapsed to allow of the germs doing their work, the liquid portion is run off from the first tank into the series of filter tanks. The harmless solid sludge left is removed by mechanical means and hauled away, being sometimes spread upon agricultural land where, according to some authorities, it is of value to the soil. This, however, is doubted by other authorities, and sometimes the sludge is dried and disposed of by burning instead.

But it is clear that for the ordinary dwelling house any system requiring frequent attention cannot be considered. In fact, it is a well-known axiom with all

sanitary engineers and manufacturers that sanitary appliances of all descriptions should be as nearly as possible automatic in action.

There have been, however, numerous modifications of the septic tank idea designed with this in mind and to provide for single installations, based upon the principle of purification by means of the putrefactive germs or organisms contained in the sewage itself.

Our illustrations show such a plant, which was planned by a sanitary expert in a northern city to provide for scattered suburban houses out of the reach of the city sewers.

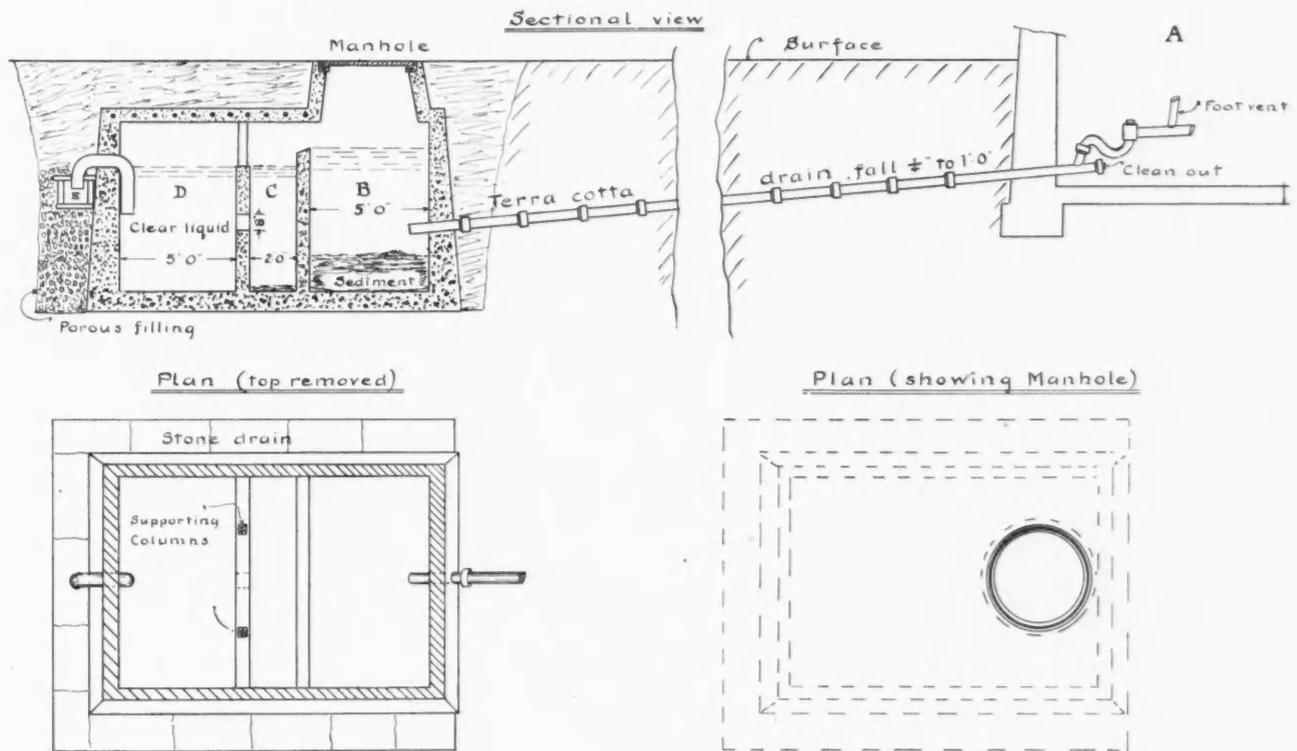
Fig. 1 is a sectional elevation of the entire system. At A is shown the usual arrangement for the piping inside the house wall, but it may be noted that the foot

perfectly level from end to end, but is sloped off rapidly towards C to form a weir-like edge over which the liquid trickles in a very thin stream into the tank C. From C it passes as clear liquid through a hole halfway up in the wall into the final tank, D, any slight sediment still remaining as it enters C from B being deposited in the tank C below the outlet.

From D the clear liquid flows out through a terra cotta invert, extending well down into the tank, into a stone drain, E, built with open joints. As will be seen from the plan, this drain extends round three sides of the whole structure, the liquid escaping from it into the mass of porous material which is packed into the excavation below the stone drain.

The manhole is placed over the first chamber to

A SIMPLE SEPTIC TANK FOR A DWELLING HOUSE



vent is not in its usual position on the top of the running trap. In districts where excessive cold is experienced it has been found the cold air is liable to descend through the vent pipe and freeze the water in the trap, and hence in the colder portions of the continent it is customary and advisable to place the foot vent some distance back from the trap so as to obviate the possibility of such an occurrence. The clean out must not be omitted, as an obstruction may occur in the terra cotta pipe, which is easily cleared by a rod operated through the clean-out hole. It is also important, in this connection, that the terra cotta pipe have a fairly good fall; certainly not less than 1/4 inch to 1 foot, as indicated in the drawing.

B is the first chamber and receives the crude sewage, which enters at a point rather less than halfway from the bottom. The edge of the concrete wall or partition between this tank and the next one, C, is

allow of the removal of the heavy sediment left there. For the ordinary household of five or six persons, a tank of the size shown would probably not require to be emptied oftener than once in two years.

After a good many years' use it would be advisable to excavate and renew the porous filling material under the stone drain, but the designer of the tank here shown estimates that in porous soils this would not be necessary oftener than at intervals of from ten to fifteen years. A better plan still, and a perfectly safe one, would be, if the lay of the land permitted, to lead the waste liquid from the final tank D into an open ditch or drain, or even into a brook or stream. No possible harm could result from this, which would be by far the best way of disposing of the liquid residue.

The construction of the concrete tank should not be difficult for anyone who has followed the articles on concrete work, which have been published in this

magazine. It might be well to reinforce the top with $\frac{5}{8}$ -inch iron rods at about 9 inches centers and a concrete pillar or two from the top of the partition between the tanks C and D might be advisable.

The cost of constructing such a septic tank as is here described, or, to be more accurate, a cesspool with septic action, should not exceed \$300 at the outside, and would be probably less in many localities.

Its position should be not less than thirty feet nor more than one hundred feet from the dwelling house, although if the ground allows of a rapid fall for the drain so as to minimize the chance of an obstruction

occurring in the long run of terra cotta piping, this maximum distance could be exceeded considerably.

In conclusion it may be said that, as mentioned earlier in this article, many sanitary engineers have devised septic tank systems for individual dwelling houses and made regulations to meet the special needs of their localities, and where such exist builders would naturally be guided by them. But in the absence of expert advice, any builder of ordinary intelligence can construct a system which will meet all the requirements for the average dwelling house and be perfectly safe and sanitary if built on the lines indicated here.

Perspective Drawing Simplified

THE SECOND OF A SERIES OF ARTICLES GIVING THE PRINCIPLES OF MECHANICAL PERSPECTIVE AND TELLING HOW THEY SHOULD BE APPLIED

By Edwin V. Lawrence

THE first line to be established in any perspective drawing is the first horizon or eye level. The height of this line above the bottom of the picture plane or ground line (G. L.) will give the height of the spectator's eye above the ground, whether he be standing on the ground or above so as to see the roof. In Fig. 1 it will be noticed that the eye,

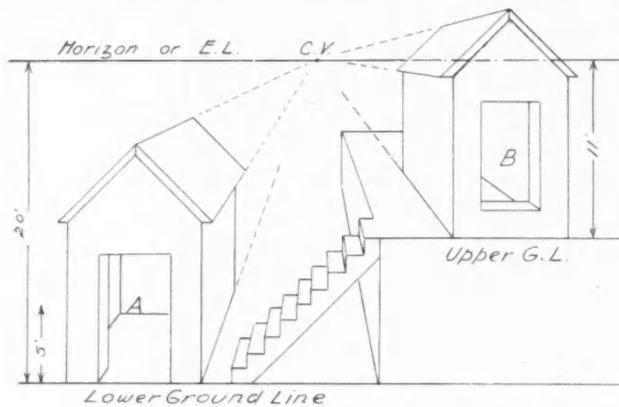


Fig. 1. To Establish the Eye Level

in A, is 20 feet above the ground line, while in B it is 11 feet.

To establish the distance of the spectator's position away from the picture plane, revolve the plane of the eye level (Fig. 2) down upon the horizon as an axis, so that the top view of the spectator's position will be superimposed upon the picture plane, and then, by measuring the central visual ray, the exact distance may be found. In other words, the (S. P.) for the perspective drawing should be placed on the (C. V. R.) as far below the horizon or eye level, to scale, as the seeing eye is distant from the object. This process is shown in Fig. 2, while in Fig. 2A the diagram is shown on the paper. Inversely, any distance from the picture plane to the spectator's position may be established by taking the top view of the central visual ray, the required length.

To find the distance back from the picture plane on a line that is at right angles to the picture plane, as

A Y, Fig. 3, draw a line, X Z, at an angle of 45 degrees to the central visual ray from the spectator's position until it meets the eye level. This line will be the diagonal of a square, W X Y Z, and one-half of the square will form a triangle whose sides, Y Z and Y X, are equal. In geometry, if three sides of one triangle are parallel respectively to three sides of another triangle, the two triangles are similar. Thus the triangle A B C must be similar to X Y Z, because the side A B is parallel to X Y (lines parallel vanish at the same vanishing point) and B C is parallel to X Z for the same reason. As A C is the ground line and Z Y is the eye level they must be parallel to each other, because the eye level and the ground line are always parallel. Since Y Z and Y X are the equal sides of the triangle X Y Z, therefore, the sides A C and A B must be equal, being the sides respectively parallel, each to each, in the similar triangles.

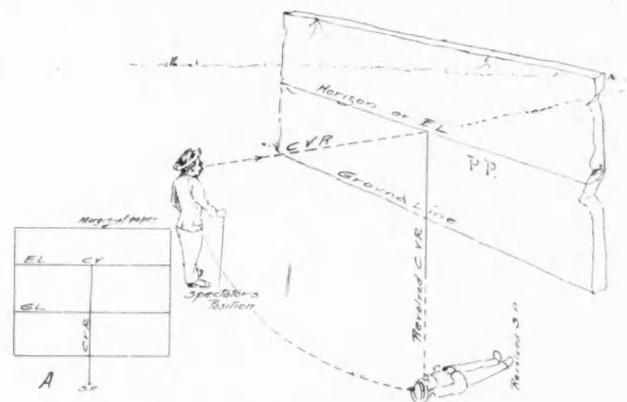


Fig. 2. To Determine the Spectator's Distance

From this it may be deduced that, by using a point, Z, on the eye level, equal to the distance the spectator is from the picture plane as a measuring point, any distance on a line parallel to the central visual ray, such as A B, may be laid off by drawing a measuring line from the end, C, of the required distance, A C, to the measuring point, Z. The measuring point may be taken on either side of the center of vision.

To find a vertical distance, or the height of a line, take the required distance on the picture plane in some convenient point, and by means of two lines vanishing

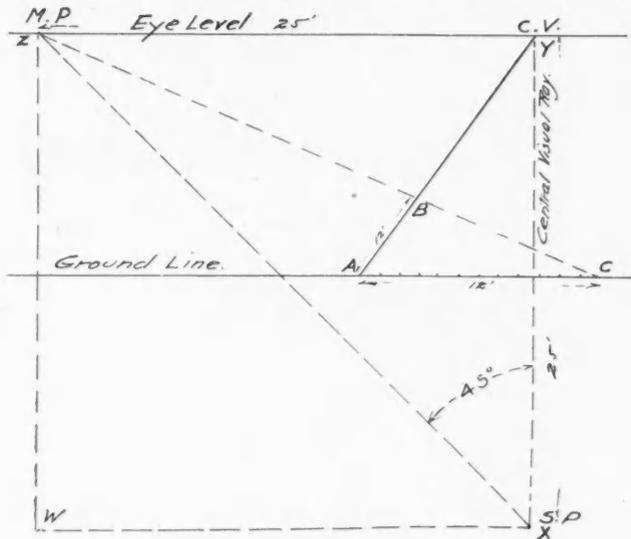


Fig. 3. Distances on 45° Line

on the eye level, cut off the required height, Fig. 4.

In the problem, Fig. 5, after the eye level has been put in, the next thing to decide upon is the height of the spectator's eye, and if 10 feet is the desired height, make the distance between the eye level and the ground line scale 10 feet. Assume the spectator's position to be in the center of the paper, 20 feet out from the picture plane, and place the center of vision also at the center. A roadway 14 feet wide is 2 feet to the left of the spectator's position and runs parallel to the central visual ray. Ten feet back of the picture plane and 6 feet to the right of the spectator's position is the corner of a house, or shed, 10 feet by 14 feet and 7 feet high to the eaves, whose roof has a 45-degree pitch. The shed has a small L on one side.

The spectator's position is 20 feet away from the

back into the picture. The height of the corner of the house having been found as explained in Fig. 4, other subordinate heights may be drawn, without the need of projecting each to the picture plane, by using this corner height as a scale.

Parallel perspective is seldom used except in a case where it is desired to show some part in absolute shape, as in the face of this shed. This to a greater or less extent distorts all objects; however, if it becomes necessary to show the face of a row of houses parallel to the picture plane, parallel perspective will be the most satisfactory rendering because it will not give the curved effect shown by a panorama camera.

The most common view, where the object is at an angle to the picture plane, depends to a great extent,

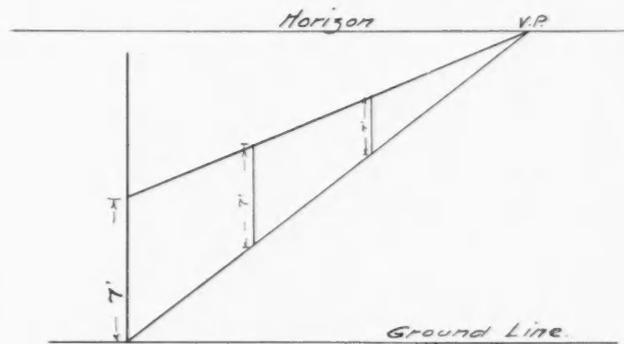


Fig. 4. To Find a Vertical Distance

upon parallel perspective, and will be taken up in a later issue.

The suggested problem for this article is shown in Fig. 5. Make a careful location of all points and add doors and windows.



Uncle Jerry Sees Through 'Em

"I see," remarked Uncle Jerry Peebles, "the life insurance companies have laid down a set of rules for

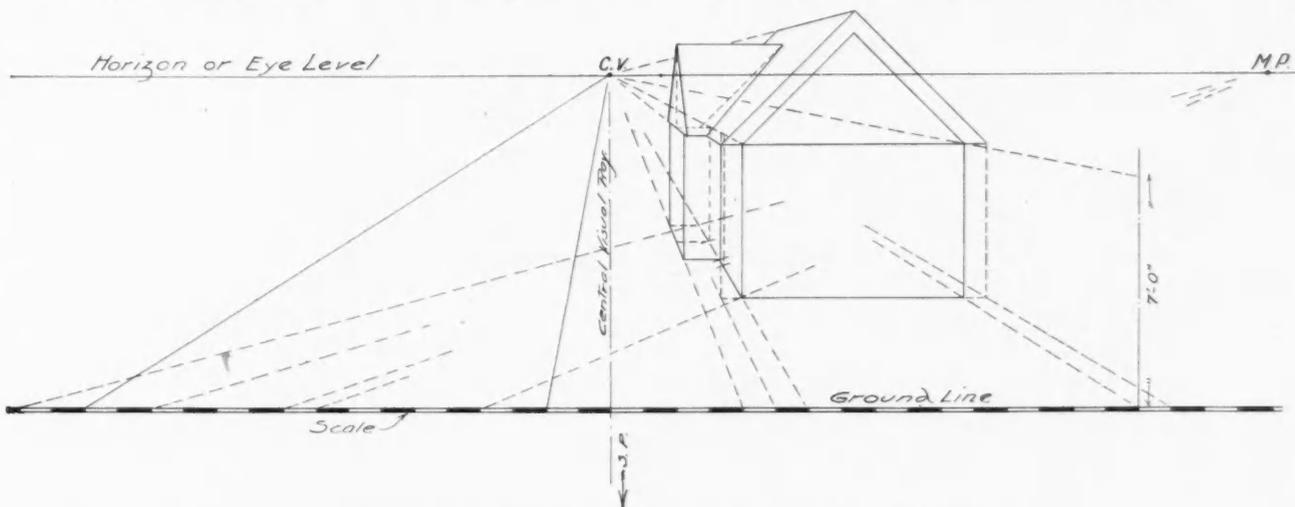
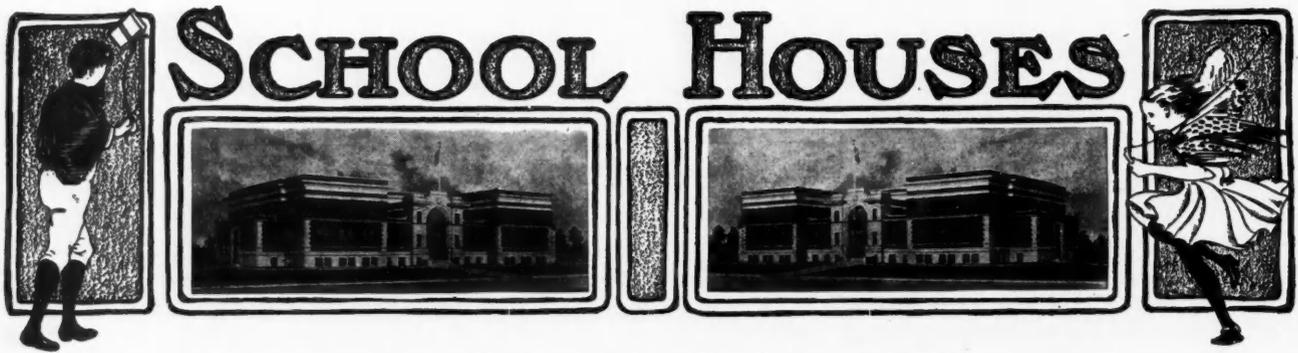


Fig. 5. Suggested Problem in Perspective Drawing to Be Solved

picture plane, so the required measuring point is 20 feet from the center of vision, and using this measuring point, the required distances can be found on lines

making people live fifteen years longer. I ain't going to pay any attention to 'em. The life insurance companies have got a good enough thing as it is."



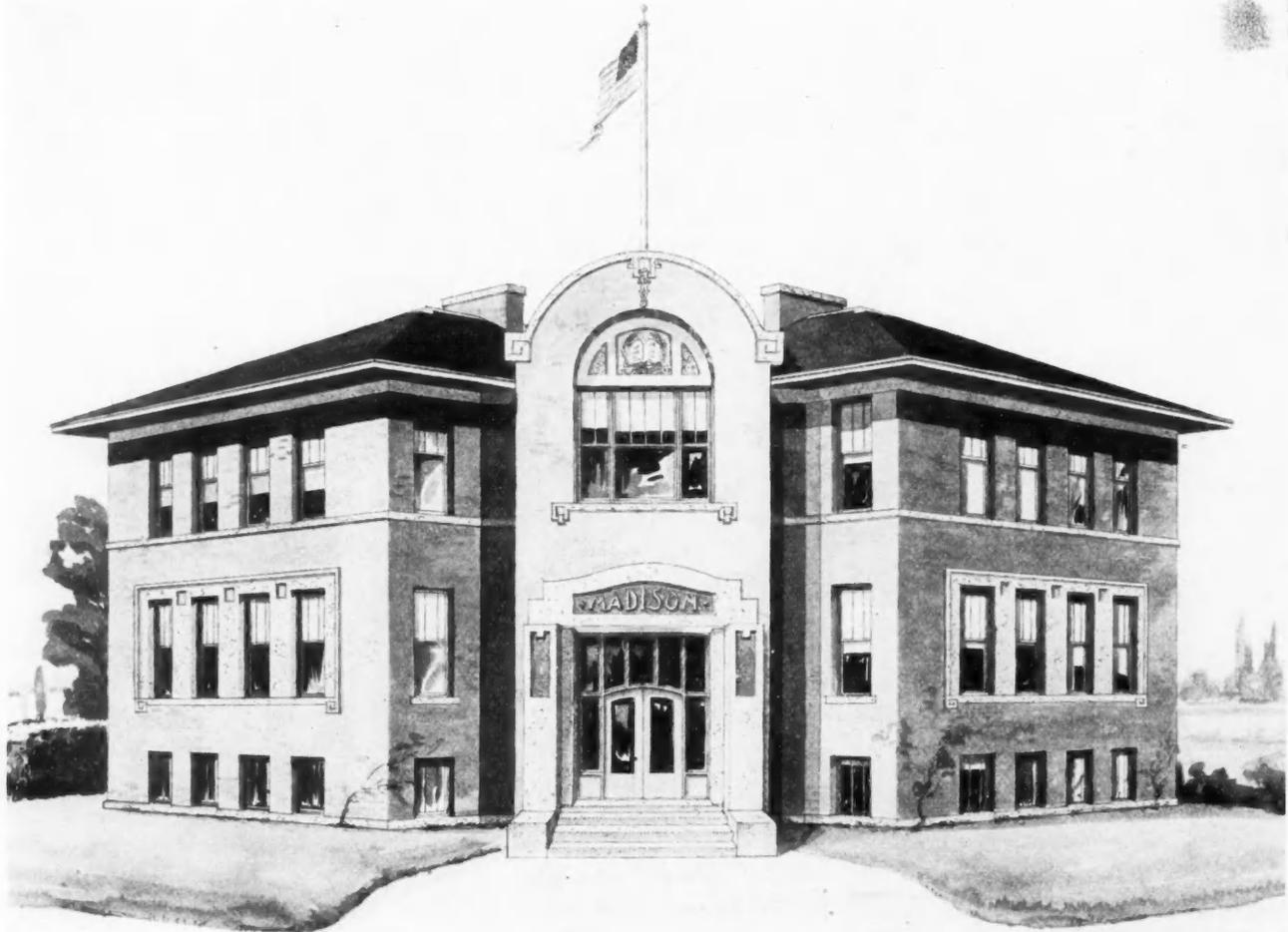
Six-room School of Novel Design

PERSPECTIVE AND FLOOR PLANS OF A MODERN SIX-ROOM SCHOOL BUILDING, ESPECIALLY DESIGNED TO OCCUPY A CORNER LOT

A SCHOOL building of very satisfactory arrangement and design is shown on this and the next page. It was designed by Geo. W. Ashby, architect, the special requirements of the site on which it was to be located being borne in mind.

The exterior treatment is good, making of the whole a very attractive building. The walls are brick, the rather elaborate trimmings stone.

The basement contains the heater room, fuel room, boys' and girls' play rooms and toilet rooms. The



The building grounds, situated upon a corner, were rather restricted; full advantage from the frontage on both streets was desired; yet only one main entrance could be had. The floor plans given on the next page show how well these conditions were complied with.

This or a similar arrangement is desirable in many instances. The corner entrance seems to be especially desirable for a six-room building as it makes possible a very convenient and economical disposition of space.

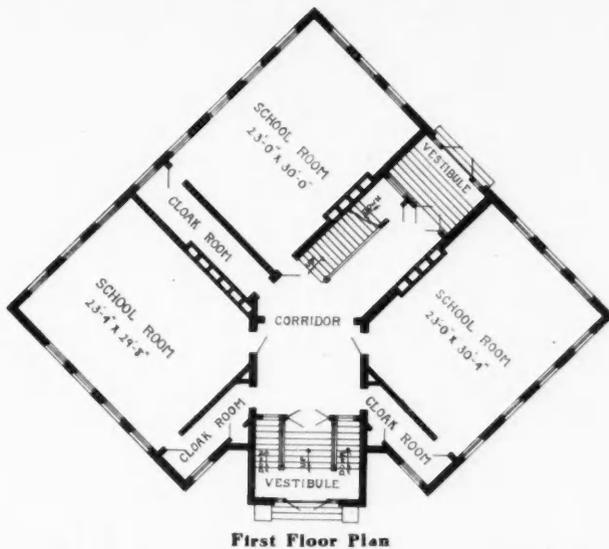
first and second stories contain six school rooms, with cloak rooms, a teachers' room, library and large halls with wide stairways and exits.

Wood Displaces Steel for Building

The San Francisco underwriters have adopted a new type of building construction for one of their own buildings, and construction is in progress. The new building is creating much interest among real estate

men, builders and architects, especially as the underwriters have looked favorably upon it. The architect, John Cotter Pelton, who originated this type of building, says he has an assurance that it will receive a fire insurance rating higher than Class C buildings, and next to Class A. He estimates the cost at about 15 per cent greater than ordinary frame buildings, and at least 5 per cent less than the common brick structure.

The building consists of a heavy frame of wood en-



First Floor Plan

cased in reinforced concrete walls of four inches thickness, anchored to the frame at each story. It is in fact a wood frame in place of a steel frame, and the heavy timbers support the floors and roof independently of the walls, which are merely "curtain walls." There are wood columns and girders, and upon the girders, after they are covered with fireproof material, the wood joists are laid sixteen inches on centers. Instead of board flooring, blocks composed of cement, plaster of paris and cinders, are set upon the joists, so that the floors are fireproof. The partition walls are made of similar blocks, made of staff and held in place by reinforcing rods.

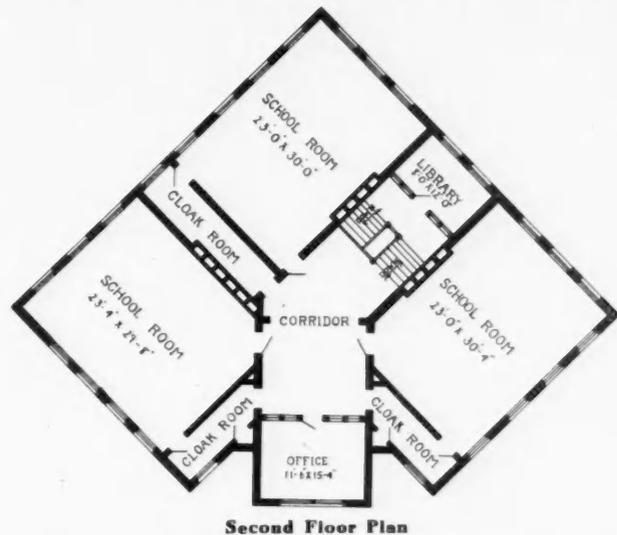
In no place does wood touch wood in the building. The frame may be erected as steel frames are put up, and later the walls are built, and the floors set in. The principle is the same as that of the steel-frame building, in which the floors are supported by the frame, independently of the walls. The inventor believes that the favorable attitude of the underwriters may result in allowing this type of construction to be used within the fire limits.



Luminous Paint

In answer to the question: "What is luminous paint, and where can it be bought, or how made?" the *Master Painter* says: Luminous paint, sulphide of calcium, has been frequently described. It is practical enough, but seems to have but a limited use. It is useful in theatrical scenery for diffusing light,

but it is not useful for signs, etc., that are exposed to artificial light at night. It must be used where it is entirely dark, for in an artificial light it will not show luminosity. In the dark, however, it can be seen at quite a distance. The match-box on the wall, in a dark room, the placing of a patch of it on a post in a road or any place where there is danger to the traveler, it works all right. In these latter cases, and similar ones, it is visible for several hundred feet away. If it is exposed during the day to the light it



Second Floor Plan

will absorb light enough to give it out all the following night, and in the daytime it appears like ordinary white paint. What is known as Balmain's luminous paint is made in England, and may be bought, we presume, at any large drug or chemical house, or be ordered through them. We do not know the cost, but it was fifty cents per pound some years ago. It is simply oyster shells and sulphur, roasted together. You could hardly make it successfully.



Metallizing Wood

Metal Industry describes the metallizing or copper-plating of wood as follows:

The wood is first coated with two or three very thin coats of orange shellac, prepared by dissolving two ounces of shellac in one pint of wood or denatured alcohol. This coating protects the wood from the action of the solution used in the process.

When the shellac is thoroughly dry apply a very thin coat of turpentine, copal varnish or hard oil finish. Allow to dry for a short time; when "tacky," dust over a coat of copper bronze powder with a camel's-hair brush, care being taken to completely cover the wood with the powder. A second application should be made with a stiffer brush, so that the coat becomes perfectly smooth.

The wood, when perfectly dry, is then ready for plating. Make up a solution of sulphate of copper, two pounds; sulphuric acid, four ounces, and water, gallon. Dissolve in hot water and allow to cool. Use anodes of pure copper.



The Versatility of the Buzz-saw

MANY USES TO WHICH THE BUZZ OR TABLE SAW MAY BE PUT WITH PRACTICAL SUCCESS—SOME USEFUL JIGS AND GUIDES DESCRIBED

By W. D. Graves

IT IS unlikely that Paddy with his wheelbarrow, and the Yankee with his jack-knife, would be able to find many jobs at which they would be equally adept, yet each with his chosen implement is capable of a surprisingly wide range of work. Indeed, it sometimes seems that the simpler the tool the wider the range of work to which it is practically applicable. Certain it is that the buzz-saw, about the simplest of

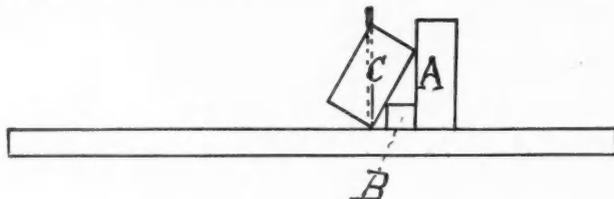


Fig. 1

power-driven machines, is capable of a great deal of work other than ripping up stock.

As in any wood-working plant it is generally the first and most essential machine, it is well to give thought to the range of work to which it is adapted; such consideration having much bearing on the number and nature of other machines required.

Time was when one who wanted a buzz-saw rig bought only the arbor and saws, of a machine dealer, and made the bench himself. Such procedure is rarely economical nowadays; for, while improved forms and iron tables have scarce increased the range of work possible, they have materially lessened the time re-

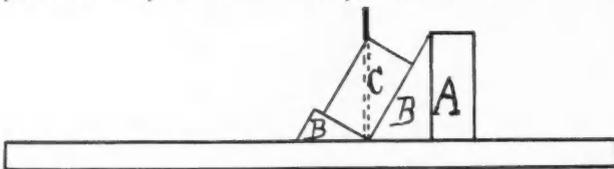


Fig. 2

quired to make the necessary adjustments and have added much in the way of accuracy and durability. Also, the time is past when a wood-worker figures that his "time isn't work anything"; it is *cheaper* to buy the complete machine.

Saw machines are now made capable of quick adjustment to all the various purposes for which a small circular saw can be used; but, as each added

capability of this sort means some added complication and cost, it is a question of practicability, which each must answer for himself, as to how far he can go in the matter. The first and essential requirement of the tool, which is usually ripping, must be kept in mind; and the strength and rigidity requisite to the efficient performance of this duty should never be sacrificed for the sake of "handy" adjustments.

A bench capable of being raised and lowered (though it raise only at one end and be held up by

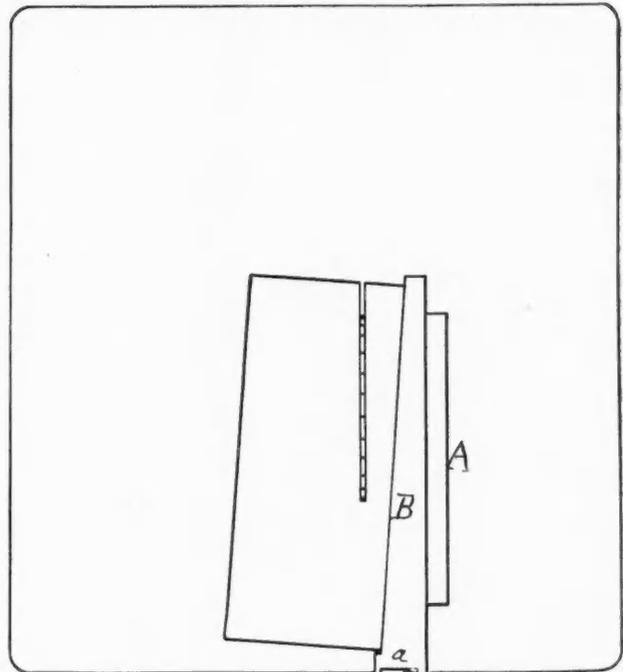


Fig. 3

putting chunks under it) can be made to answer every purpose. Whether or no the time lost in making adjustments with such a rig will eat up all the profit depends upon the amount of work to be done. If one has only an occasional small job of bevel sawing to do, the purchase of an expensive tilting table would doubtless be ill-advised; but it requires no great percentage of this class of work to make such investment profitable. Where one's machine has not the desired adjustments he can generally devise some makeshift that will answer the purpose; but it must be borne in

mind that the time and material used in making such makeshifts must be charged to the individual jobs to which they appertain, and that the cost of but a few such will pay for a handier arrangement. It is far from the writer's intent to advise the indiscriminate purchase of the most expensive "new fangled" machines; but it is a safe assertion that the inexperienced buyer will generally err in the way of buying a too cheap one. It is no "bull" to say that a cheap machine is apt to be dear at any price.

In writing of the various jigs and devices which

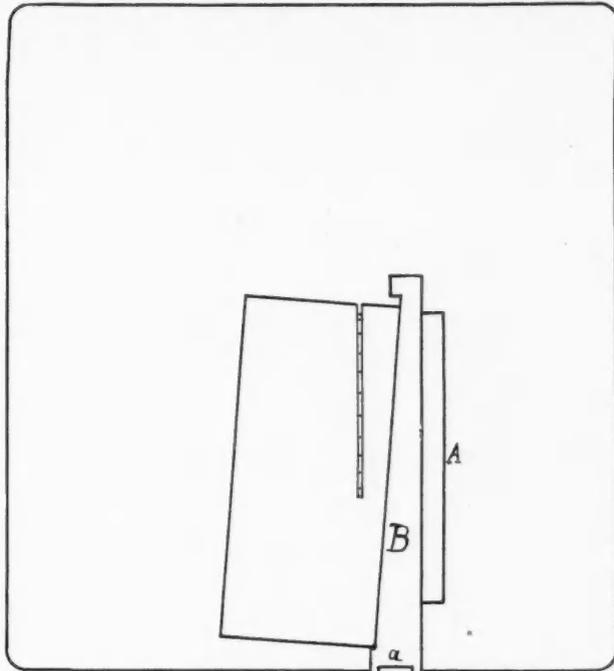


Fig. 4

follow it is assumed, in each instance, that the reader has a machine lacking special adjustment for the purpose. As there are but few machines having *all* adjustments, each of these devices stands a chance of being useful to some one.

Let it be said at the start that any device for guiding stuff to be sawed should end in such manner as to let the stock fall away from the saw teeth as soon as possible after the cutting is done. In no case should it extend beyond the back of the saw, for the most fruitful source of accident, on such machines, is from the catching of stuff by the back teeth. A stick so caught is even more deadly than a bullet, and one had as well stand in front of a loaded rifle, with a maniac at the trigger, as to stand before a bench saw whereon the gauge or guide extends beyond the back side of the blade.

After straight ripping, perhaps the most common requirement for the builder is to rip stuff diagonally. This may be accomplished by tacking or clamping a strip against the gauge, as shown in end view in Fig. 1. Here A is the gauge, C the stick being sawed, and B the jig. A much better way to accomplish the result is similarly illustrated in Fig. 2. Two pieces are gotten out of such bevel that, when placed together as at B, B, they will form a trough of such shape as to hold the stock in the desired position. It will

usually pay to keep on hand such pieces of the correct bevel for ripping two by fours and squares; and to have a convenient method of fastening them to the table.

Another quite common requirement is for stuff ripped tapering, lengthwise. For this purpose a jig like the piece B, Fig. 3, is used. The figure shows a top view of the saw table and jig, instead of an end view as in the preceding figures. The jig should always be made with the narrow end ahead, as shown, so that when the cut is completed a quick forward thrust will throw the work clear of the saw. Some sort of handle, attached near the end of the jig, as at a, is almost a necessity, in order that it may be readily and surely controlled. Of course, the stock will have to be turned end for end at each cut. Never undertake to accomplish the result by turning the jig, for the least effect of such method is apt to be excessive ventilation of the building, while the life of the operator is in no small jeopardy.

If the piece sawn is very short, not more than ten inches or a foot long, it is sometimes advisable to make the jig as shown in Fig. 4. In this case the notch should always be made a little longer than the stuff being worked, so that when the jig and stock are drawn back the loose piece will have a chance to fall

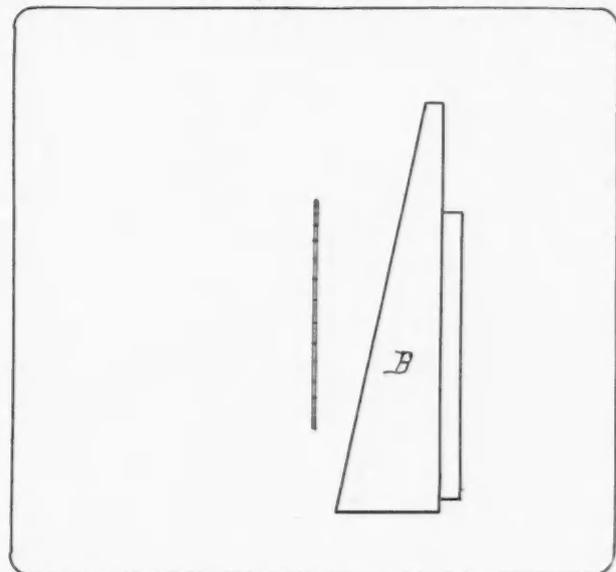


Fig. 5

a trifle away from the saw, avoiding scratches and danger of catching.

While one of the many dado and grooving heads is far preferable for the purpose, any ordinary groove may be made with a common circular saw by using wedge-shaped collars to give it "wabble."

These collars may be made of wood, even soft pine will do very well, and any saw will do, but as it has a tendency to spring and to make the groove narrower in the hard places, it is better to have a stiff one, no larger than necessary, for this work. One should have, anyway, something of a variety of saws. For the average run of ripping one wants a saw large enough for the heaviest work within the range of his machine. This he wants as thin as is compatible with

its size and the nature of the work, and somewhat coarse—for a coarse saw will cut faster with the same expenditure of power than a fine one. For specially smooth work one wants a somewhat stiff blade with fine teeth, and preferably not larger than is necessary in order to reach through the stock. In making a groove of such width that the saw has to be much tilted it will be found necessary to elongate the eye a trifle, so it is better to have a blade specially for this purpose—better still to buy a dado head to fit the saw arbor.

That the circular saw may be advantageously used for cutting an approximately semi-circular groove, for gutters and the like, is a fact with which many operators of considerable experience are unacquainted. It is a "trick" worth knowing. This feat is accomplished by running the stuff diagonally over the top of the saw, making the angle greater according as the groove is to be wider in proportion to its depth.

A jig for this job, shown in plan in Fig. 5, consists simply of a triangular piece of board affixed to the gauge. For the first cut the saw teeth are allowed to project only an eighth of an inch, or such a matter, above the table. The saw is then raised (or the table

lowered) another eighth of an inch, and the stuff run over again, the operation being repeated till the desired depth is attained. The groove will not be of the exact form of a segment of a circle—rather parabolic in contour—but, with a saw the greatest projection of which above the table is about the required depth of the groove, a very close approximation to a semicircle can be cut. To get the required bevel for the jig one may set the saw so that it projects above the table to the required depth of groove. Then place a straight-edge close to the back, and another close to the front teeth, keeping these parallel and swinging them till they are as far apart as the desired width of groove. They will then lie on the table at the angle at which the stuff must be run over the saw.

These are but a few of the many purposes for which a buzz-saw may be used, and their enumeration will have been of scant value if it fails to suggest others. An ingenious mechanic, even with the smallest plant, will usually find a "way out" of the problems which frequently confront him, but it should be considered that the finding of these ways takes time—and time is money. It takes but little special work to pay interest on the slight extra cost of special machines.

A Box with Secret Drawer and Recess

AN INGENUOUSLY CONTRIVED ANTIQUE BOX WITH SECRET COMPARTMENTS—HOW IT MAY BE FASHIONED AND PUT TOGETHER

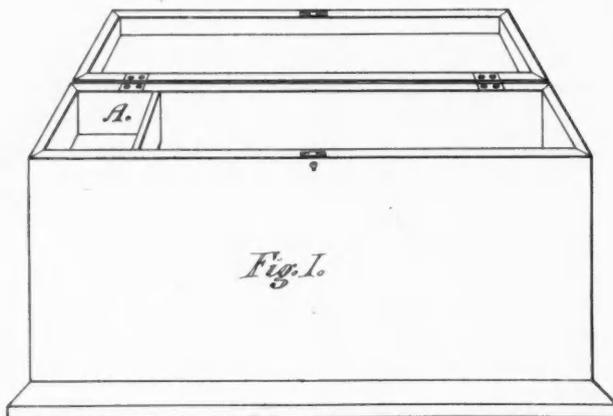
THIS box was made by an old carpenter, many years ago, in which he kept private papers and money.

Fig. I shows a general view, and Fig. II an inside view of the box, the lid and front being removed. Both views are shown in perspective.

The material from which the box is made is $\frac{1}{4}$ inch thick for the top, bottom and sides, and $\frac{1}{8}$ inch thick for the drawer, false bottom and lidless box to the left, marked A.

The sizes are 6 inches deep, 6 inches wide, by 12 inches long, outside dimensions.

The box was made in the usual manner, by nailing

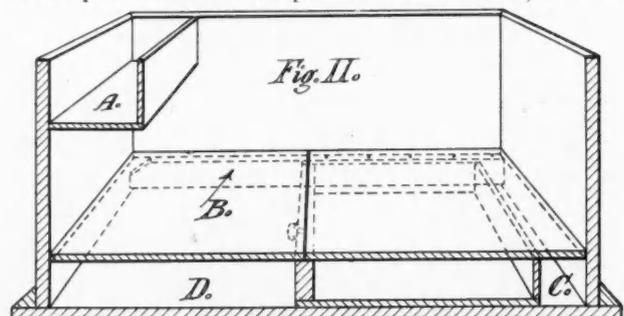


up solid and then cutting out the lid one inch from the top.

Referring to the sectional view, Fig. II, the false bottom is made in two parts, one of which is nailed

to the two strips of wood marked B (one of them not shown).

The other half of the false bottom is loose, and rests upon these two strips. As will be seen, one end



of them is chamfered so that when pressure is brought to bear upon the end of the false bottom under the box A, it will tilt up and can be taken out.

The drawer is made of such a size that it will just clear the opening thus made, without the knob, which must of necessity be removed, this being one of the secrets to get at the recess C. The knob is an ordinary screw knob. The front of the drawer is made of three-eighths stuff.

A piece of felt, or cloth, the exact size of the inside of the box, is glued down to the fixed half of the false bottom, and left loose over the other half.

The bottom of the box, D, is 7 inches wide, 13 inches long, by $\frac{1}{8}$ inch thick, the corner pieces, of molding, being $\frac{1}{2}$ inch.

The box is furnished with lock and hinges, and was nicely varnished inside and out.



A Good Suggestion

To the Editor:

Ellis, Kan.

I am a charter member of your magazine and I always enjoy reading it. It contains much valuable information. I have noted the different comments on "The Proper Care of Tools," which leads me to make a suggestion which I got from a brother carpenter several years ago. I used to use a piece of oily waste, which keeps the tools nice but makes an awfully dirty, oily place in the tool chest where it is kept, unless kept in a box.

Procure a small round tin can with a tight cover, about 1½ inches deep and from 1 to 1½ inches in diameter, or larger if desired. Then procure a strip of soft flannel and roll it up as tightly as possible, and twist it into the can so that it will be so tight in the can that it will not come out easily. When in the can it should project above the can about ¼ or ½ inch (not so much as to interfere with cover); then saturate with a good light oil. When this is rubbed over the tools it will feed just enough to keep them in good shape. In oiling bits and uneven surfaces, rub the fingers over sponge and apply to tools with fingers. After using put on cover and place in chest, which will take but little room, will keep clean and free from grit, and will not make dirty place in chest.

M. R. RAYNESFORD.

In Real Estate Circles

To the Editor:

Denver, Col.

Enclosed find order for a renewal of my subscription. Just to show you what we of the Gates Bros. Realty Company

think of the AMERICAN CARPENTER AND BUILDER I want to say that the publications for the years 1905, 1906, 1907 and 1908 I have had bound into four volumes with the year of publication on each one. In the first volume, and as a fly leaf, I have had bound in my certificate of charter membership. I would not do without the volumes for twice what it cost to bind them. Am sending you an idea of how they look on my desk—1908 happened to be on my drafting table when the picture was taken.

CHAS. M. GATES, Secretary.

He Wants to Build a Barn

To the Editor:

Monroe, Ohio.

I wish to ask for some information through the AMERICAN CARPENTER AND BUILDER. I expect to build a barn for myself this spring on fifty acres of land I just purchased. My question is this: Which is the best way to build a barn 26 by 46 feet in size and 18 feet to plate? Will have solid concrete wall under entire barn. Would you advise using big timbers mortised and tenoned together or a balloon frame with 2 by 4's placed on 2-foot centers and sided with patented siding? How should it be tied together? Would 2 by 8 inches 26 feet long be all right with tight mow floor over all except driveway? Will 2 by 6 inch rafters be all right for that width? I want to use shingle roof. I hope to hear through your next issue.

GEO. VOGEL.

Answer: As the size of this barn is not large, would not advise using heavy timbers, except for the sills, and for this not more than 6 by 8 inch, properly framed and anchored to the concrete with bolts. Two by four studding set on



A Real Estate Man Who Keeps His Bound Volumes Close at Hand

editor wants us to answer him a question. May I pass my hand? Like two Germans: One says, "Will you tell me the answer of something?" The other replied, "I will if I don't know it; what's the answer?"

But I will try Mr. Liffingwell and Mr. Hays' stickers. Looks like it requires a magician to solve them, though. Let's see. To find the area of a circle, radius times radius times 3.1416 equals 7,854 square feet. Area building, 25² equals 625. Building occupies 625 square feet. The cow has access to every foot of the 7,854 minus 625 equals 7,229 square feet to graze on.

(Editor's Note: Look at the problem again, brother.)

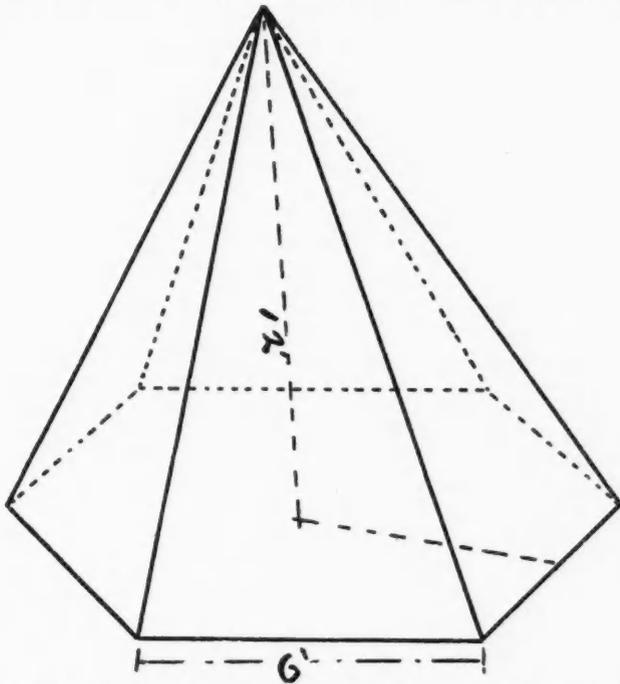
Mr. Hays' problem is somewhat perplexing also. I could not decide whether he wanted so many boards or merely wanted to know how much could be gotten out of the stick. However, I will get the cubical contents and pass the stick to the sawyer:

$$\sqrt{144 \times 36} = 72$$

$$144 + 36 + 72 = 252$$

$$\frac{252}{1} \times \frac{144}{3} = 12,096 \text{ cu. in. or } 7 \text{ cu. feet or } 84 \text{ ft. B.M.}$$

The sticker I am submitting is to find the lateral area of



a hexagonal pyramid, each side of whose base is 6 feet and altitude 12 feet.

B. P. TUREAUD.

Board Feet in Timber

To the Editor:

Minto, Iowa.

I am a new subscriber to the AMERICAN CARPENTER AND BUILDER, but will take the liberty of sending solution to problem submitted by S. W. Hays, in March number of AMERICAN CARPENTER AND BUILDER. As stated, the timber is 12 feet long, 12 inches square at one end and 6 inches square at the other. The timber is in the form of a frustrum of a pyramid, but will not figure it as such. In squaring the timber up by ripping off a 3-inch piece at the large end and tapering to feather edge at other, and reversing two of the pieces, he will have a stick of timber 12 feet long, 12 inches wide and 6 inches thick, or 72 board feet; but will have left 4 pieces in the shape of a pyramid, each piece being 3 inches square at bottom and 12 feet long, tapering to point. Square of base times one-third of height will give the volume: 3 times 3

times 48 equals 432 cubic inches, or 3 feet board measure, times 4 equals 12 board feet; 12 plus 72 equals 84, which is 84 board feet in stick of timber.

J. E. McCLARY.

Others

A similar result is found by:

- C. P. Colvin.....Avon, N. Y.
- A. W. Funk.....Allentown, Pa.
- Harry A. Lovett.....Harrington, Me.
- F. O. Buchanan.....Abbott, Texas
- O. E. Whitney.....Spokane, Wash.
- A. L. Lake.....Los Angeles, Calif.

Another Method

To the Editor:

Huron, S. D.

I cut the timber 6 inches square, and as it is 12 feet long it will hold 36 feet. Now I have 4 pieces in the form of a wedge; 2 of them holding 9 feet apiece, equal 18; the other 2 holding 27 feet. The total is 36 plus 18 plus 27, equals 81 feet board measure.

E. SWEEN.

Others

This result, 81 feet board measure, is found by:

- A. O. Stien.....Fossum, Minn.
- C. T. L. Hickman.....Dalton, Ga.
- J. S. McMillan.....Republic, Mo.
- Burr Gunsallus, Baldwin, Kan., makes it 75.58 feet board measure.

Werner A. Richter, Topeka, Kan., cuts the timber most economically of any, so it would seem, for he gets out of it 126 board feet.

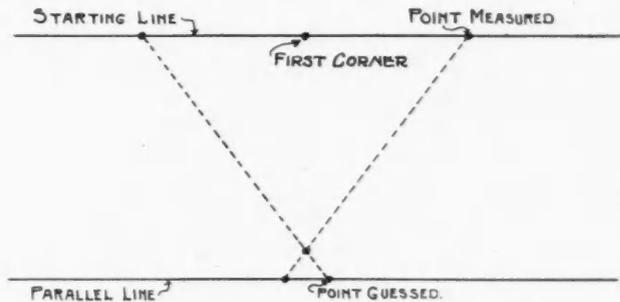


Squaring a Foundation

To the Editor:

Linden, Ind.

I am a charter member of your paper. I like it very much, and have received many helps from it. Herewith I am sending you my plan of "squaring" a foundation. The 6, 8 and 10 rule is often not convenient to get all points at once; and a given hypotenuse takes time to figure out. I draw a line parallel to my starting line at opposite side or where there is to be an angle. Now, stick a pin in line at corner stake and measure a given distance each way on the line; usually about



as far as the parallel line is distance away. A steel tape is most convenient for measuring. Now from one of the points measured, draw a tape to as nearly square across from the corner, as can be guessed at, and place a pin there. Then measure the same distance from the other measured point and stick another pin. Divide distance between these two pins and you are "squared" across from first corner, and the rest is easy.

JOHN K. PARKER.



Roof Truss for a Skating Rink

To the Editor:

Freeport, N. Y.

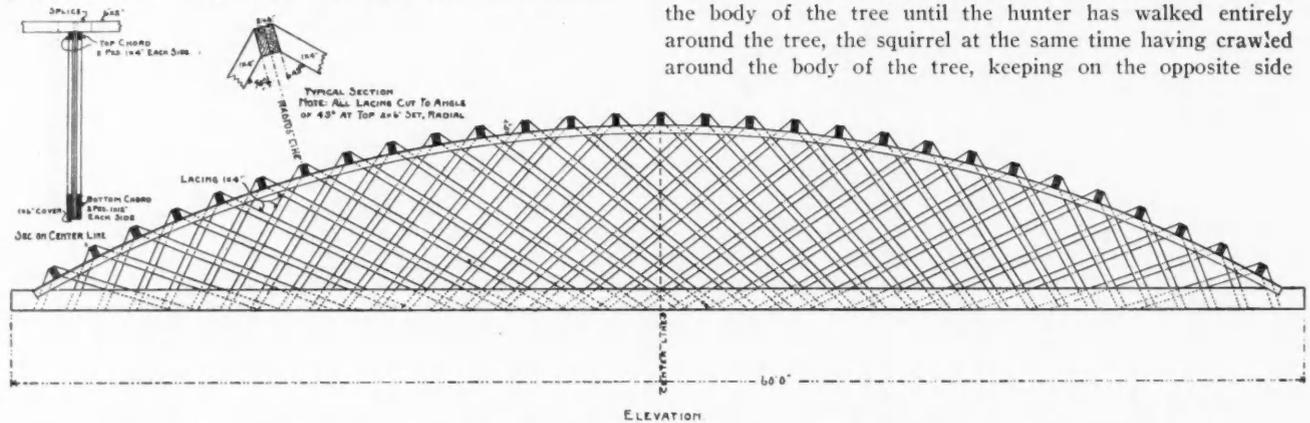
Would you kindly tell me what you would consider the best and cheapest way of framing a roof for a skating rink and dancing hall, as I have one to build. The building is 68 by

82 feet. Enclosed you will find my idea, but I do not want to have the iron rods showing, and I cannot see any way out of it.
HENRY RANDALL.

Answer: The sketch furnished, as above mentioned, is not practical for so wide a span as called for. A better form

have decided to leave it to the readers of the AMERICAN CARPENTER AND BUILDER:

There is a squirrel on the body of a tree; we will say about three feet from the ground. A hunter wants to get a shot at the squirrel, but the squirrel keeps moving around the body of the tree until the hunter has walked entirely around the tree, the squirrel at the same time having crawled around the body of the tree, keeping on the opposite side



of truss for this class of work is like that published and described on page 488 of the July number of this magazine. It is constructed of light timbers, which can be had in any lumber yard and is easily constructed. The illustration with that article is herewith reproduced. No unsightly rods are required to keep the side walls from spreading as in this form of truss; the truss itself acts as a tie and when properly anchored, there can be no tendency to crowd the walls out. Six trusses, exclusive of the ends, will be sufficient for the length above mentioned, which would be a little less than 12 feet from centers. The covering for this form of roof can be of most any of the roofing materials, aside from the gravel-coated, as the inclines at the sides are too steep to stand the wind and wash that it would be subject to for a very long period of time.
A. W. WOODS.

from the hunter. Now, has the hunter walked around the squirrel?

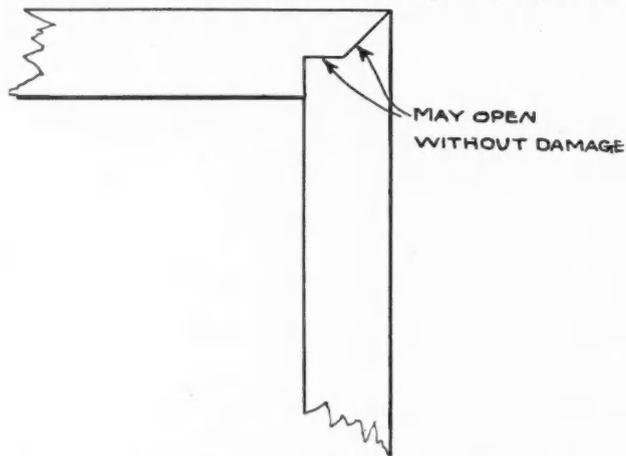
The above may be old to you and seem rather foolish, but it will settle the dispute between us as we have both agreed to abide your decision.

Here is one more little favor I would like to ask. I have bought a four-room cottage and small tract of land near the Platte river, a stream running near our town. If some of the readers should see fit I would like for them to place in your journal a model or working drawing showing how to build a row boat. I expect to spend what leisure time I may have this summer fishing. The drawing may be of benefit to others also besides myself.
H. M. THOMAS.

A Good Miter Joint

To the Editor: Linden, Ind.
I like very much your exchange of ideas in the columns of the AMERICAN CARPENTER AND BUILDER.

Here is how I get over a miter in solid porch plate, or other



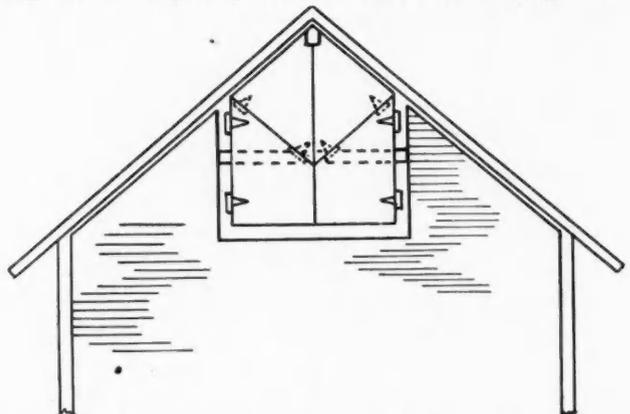
places where it is desired that the mitered sides show and where the edge cut is not exposed. The timbers are often crooked and this joint will allow for considerable variation from the square.
JOHN K. PARKER.

Squirrels and Row Boats

To the Editor: Cosby, Mo.
One of our Brother Chips and myself have been having an argument on a very simple little question, and to settle it I

Convenient Hay Mow Door

To the Editor: El Reno, Okla.
Replying to the request of A. Landphere, Cleveland, Ohio, I submit a rough sketch of "double hay doors" for a barn. This is one that I have seen used and have had occasion to make use of myself and is one that I think is very satisfactory. In the way of general instructions for making, I will



say: Lay off the door in halves to fill the opening clear up to the track. Next begin at the outer upper corner and lay a downward line towards the center of the door at the same angle as the pitch of the roof. Cleat and saw on this line and put hinges on the inside. This top "leaf" will then fold down as the door opens and all will swing under the cornice and lie flat against the wall. To fasten the doors open, make a double-ended spiked pole with which press the "outer" or "top" fold of the door up firmly against the fascia, seating the lower end of spike pole near the bottom of the door. There should be a 2 by 4 or 2 by 6 bar across the opening to hook the doors to, as well as for safety, while opening or closing.

Trust that the sketch and explanation will be sufficiently plain and that this plan may be helpful to others besides Bro. Landphere.

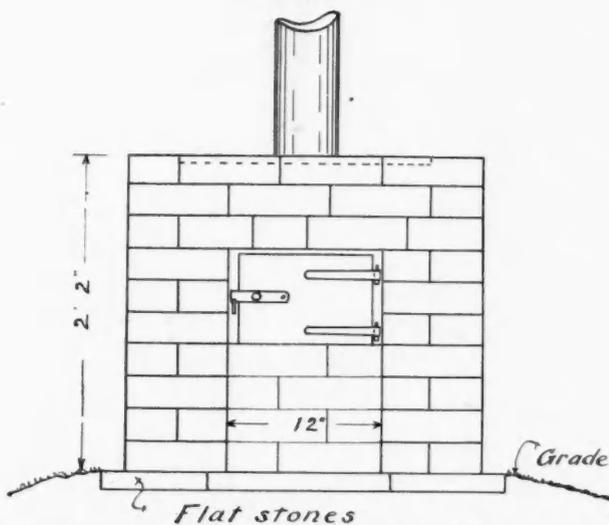
H. E. McCREIGHT.

Disposal of Kitchen Waste

To the Editor: Chicago, Ill.
On reading the article beginning on page 514 of your February issue, I am constrained to ask if you can give me any information regarding sanitary disposition of kitchen garbage under such conditions as are referred to by Mr. Marrs.

I am building a summer cottage or bungalow in Michigan, and we have been more or less concerned as to what we would do with the kitchen garbage, for instance, egg shells, coffee grounds, potato parings, refuse from the table, etc. We cannot throw it in the lake, and using gasoline for cooking, we cannot burn it as we might if we used a coal or wood

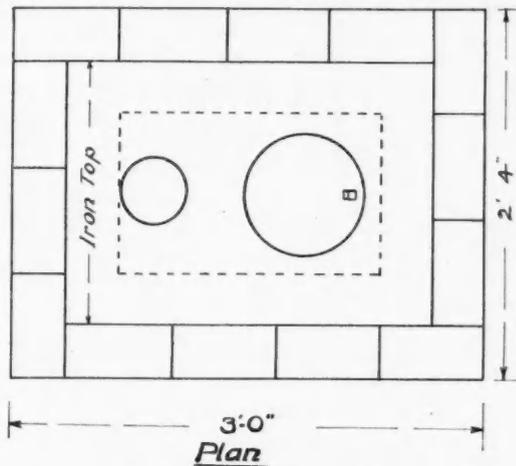
Elevation



range. I have thought I might construct some form of home-made crematory for the purpose. Could you give me any suggestions on the subject, or if not, can you refer me to anyone from whom I can obtain the information.

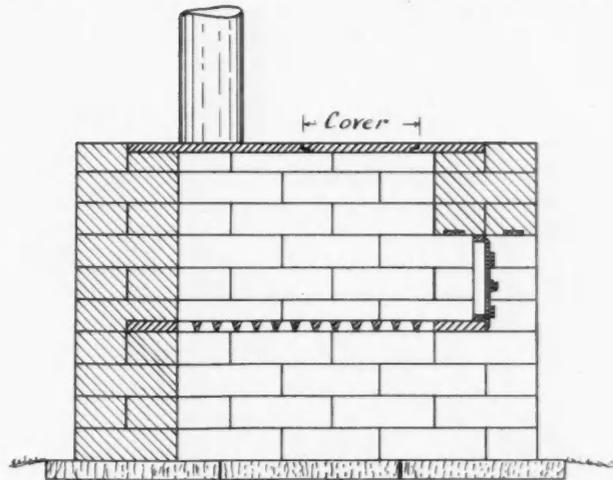
J. F. HURD.

Answer: A simple "destructor," as the great plants used in the cities for burning up house refuse and garbage are termed, can be built for a few dollars for your summer cot-



tage. The sketches here given show the construction, the body being of common bricks. It would pay to line it with fire brick probably, although good ordinary brick would last a long time, as the fire would not burn for long periods. The grate would be a simple affair with bars and frame cast in one piece, and something suitable could most likely be picked

up from any jobbing iron foundry. The door at the side is useful for putting in a few pieces of wood to start a fire, and also for cleaning out the resulting clinkers and ashes. The top is a plain plate with a hole and a cover like an ordinary kitchen range and a neck at back to allow for a



Sectional side elevation

few feet of sheet iron being attached to form a chimney. The fire would be lit from the door and when well alight, the refuse put in through the hole in the top, the cover being taken off with the usual "lifter." As the draught would be rather fierce, it might be as well to cover the upper end of the chimney with a piece of wire netting to serve as a spark arrester and prevent risk of fire in the surrounding bushes or trees.

Incidentally, our correspondent's question raises an interesting point as to the disposal of house refuse, a matter which has not yet been taken up seriously in many American cities. The writer was speaking to a leading American sanitary engineer recently on this question and he stated that while from a health standpoint it would pay even the smallest towns to burn their domestic refuse in a public destructor, for towns of 20,000 and over it was an actual paying proposition in dollars and cents. He instanced cities in Great Britain and Germany which obtain power for electric light stations, and warm water for public baths, from the burning of house garbage, and then grind up the clinkers and residue for concrete, cement paving, etc., afterwards.

T. B. KIDNER.

To Find the Angle with Steel Square

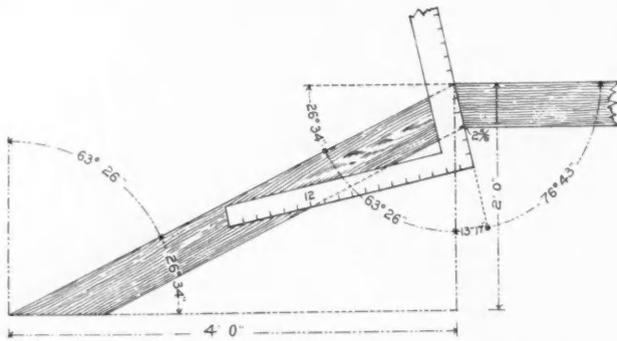
To the Editor: Leominster, Mass.
Being a charter member, I venture to ask a question, or rather have one explained. Enclosed you will find a sketch of a bay window angle; and I would like you to explain a rule showing how to get the miter with the aid of the steel square.

In the June, 1908, number there is an answer to a question of Mr. Woodson, for finding the miter for a truss, which is on the same plan; but I fail to make that rule work even with the example given. According to the rule, 12 and 6 should give the octagon miter, yet we know it to be 12 and 5.

Kindly explain and oblige, FRED G. NYE.

Answer: The question to which Mr. Nye refers as being published in a previous number of this magazine, was answered by one of our readers; looking it up, we find that the answer given, while approximately so, is not correct. The more acute the angle, the greater the error will be. This problem to solve with the steel square is rather a difficult one to explain, unless one is familiar with the laws of degrees and how to apply the steel square in connection with

them. Since the angles in degrees are not given on the steel squares, it requires a mathematical problem of no small proportions or resort to the use of a protractor to find the angle on the square. As this all takes time and still leaves the matter in the form of an example to be solved, it is simpler and more quickly done by making a diagram of the angle desired, obtaining the miter from that and thus avoid the chances of an error in a mathematical problem rather than to try to solve the problem with the steel square. However, as Mr. Nye has asked for a square deal, we submit the following:



Taking the example in question, the bay has a projection of two feet in four. This is the same as 12 and 6 on the square and, as will be seen, falls in fractions of degrees, 26 degrees and 34 minutes. This amount, taken from 180 degrees, leaves 153 degrees and 26 minutes and represents the angle of the corner. Now, as the juncture of the two pieces, or miter, should rest at one-half of the above angle, it would be at 76 degrees and 43 minutes, which is the angle that the miter rests from either side of the frame. The next thing to know is what are the figures to use on the steel square to obtain this angle. By using 12 on the tongue as a starting point, we find that 76 degrees and 43 minutes would pass an extended line on the blade at 50 5/6 inches and the cut would be on the tongue. This being beyond the limits of the square, it is necessary that other figures be substituted, such as one-fourth of the above, which would be 3 and 12 17/24. Or by taking the complement of 76 degrees and 43 minutes to 90 degrees, which is 13 degrees and 17 minutes, we have an angle given by 12 and 2 5/6 inches on the square, as shown in the illustration. This is giving the angle by a mathematical calculation; but as we said at first it would be better in most cases to lay off the angle of the desired corner and then bisect it for the miter; this may be done either by the aid of the square or compass. The result will be near enough for all practical purposes.

A. W. Woods.

Cheap Way to Deafen Walls

To the Editor:

Dover, N. Y.

Which is the best and cheapest way to deafen a center wall in a double house, so that the occupants of one side cannot hear the other?

What is your opinion of back plaster or brick for this purpose?

ROBERT J. PHILIPS.

Answer: A very good way is to set a double row of

studding, as shown in the accompanying illustration. The studs are of 2 by 4 inch stuff, set in the usual way, but set staggered, so that the face lines will be 6 inches apart. This will leave a space of 2 inches between the studs and the plastering. Then on the inner edges of the studs, heavy felt paper or hair insulator quilt should be stretched and made secure by nailing a lath over the stud, as shown in the section. Two by six inch plate can be used at the top and bottom. The floors should be deafened, and this can be done very satisfactorily by putting down a rough floor of shiplap, and after all rough work is done, cover this with felt or hair cloth and lay the finished floor.

As to back plastering of the wall to deaden the sound, we doubt if it will be as effective as the above method. As for brick, while it will be better than either of the above, it will cost more, but would not advise it unless all of the walls are of same material.

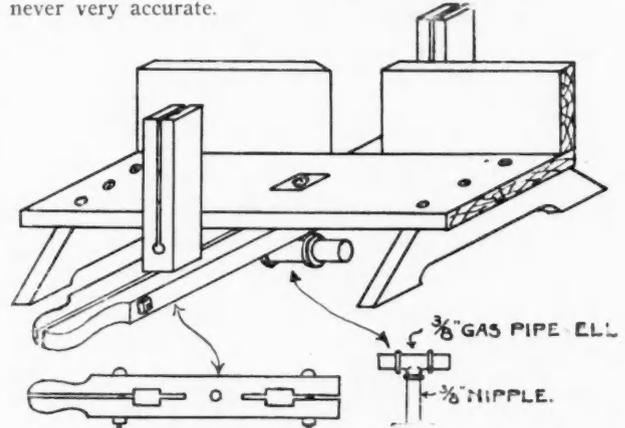
A. W. Woods.

A Home-made Miter Box

To the Editor:

Lima, Ohio.

I herewith enclose a sketch of a miter box that I made at one time to work up some moldings into frames. I find that a common box with two sides soon wears out, and is never very accurate.



In the sketch, it will be seen, that it is adjustable from forty-five to square cut. It will outlast a dozen common boxes, as the saw guides are made so that the saw runs in them, the same as in ripping.

L. D. BOND.

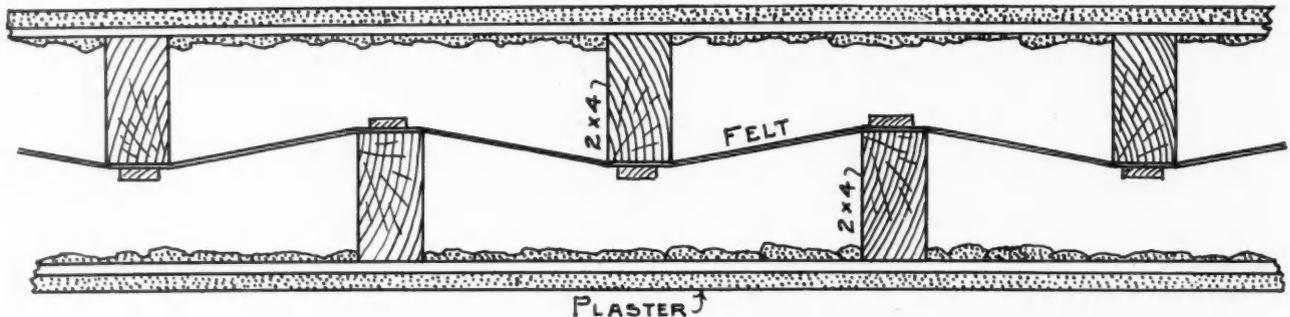
Fireplace Suggestions

To the Editor:

Herculaneum, Mo.

In reply to Mr. Tom Jones' request for proper openings for fireplaces, will give the following, which I find to answer all purposes: Size of hearth can be 18 by 60 inches or 21 by 60 inches; size of opening in front 24 inches wide, 30 inches high; depth of fireplace can be either 12 inches or 18 inches--I prefer 12 inches. A good size for throat or flue is 8 1/2 by 13 inches. I always use 8 1/2 by 13 inches fire clay flue lining for fireplaces. The first joint above fireplace should be tilted backward at top about 2 inches. I find this keeps the fireplace from smoking.

J. W. DUGAN.



A House on Wheels

To the Editor:

Sand Run, Ohio.

I am sending you a sketch of a portable or traveling house, which may interest some of my brother carpenters.

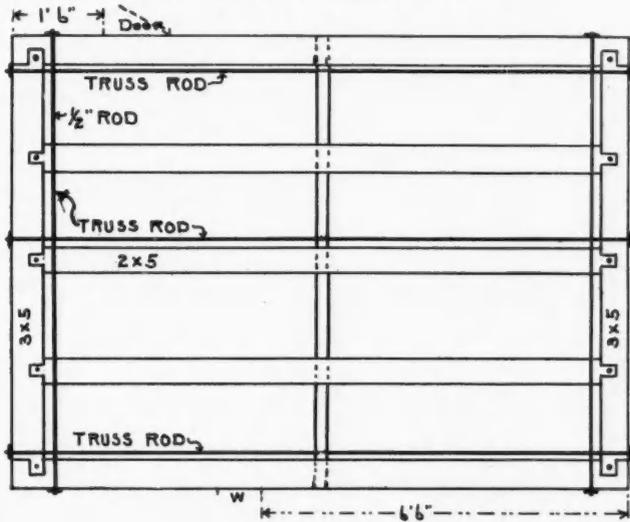


FIG. 1.

First let us see about the carriage; an ordinary two-horse wagon will be O. K. with wheels not too large, rear wheels 3 feet 6 inches, front 3 feet. The rear axle should be made longer, about 7-foot track, to guard against upsetting.

The bolsters should be built so that they will pass over the wheels, as shown in Fig. 2. The front bolster to be so that it can rock considerable to keep it from twisting the house in going over uneven roads. See Fig. 3.

Figs. 4 and 5 represent a side and end view. Fig. 6 represents a 5-inch angle made from 1/8 by 3 inch strap iron bolted with 3/8-inch bolts to top and center corners, catching plates

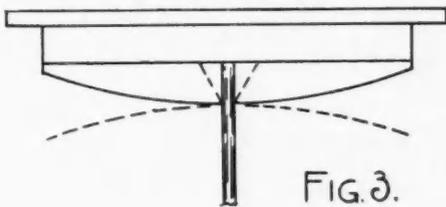


FIG. 3.

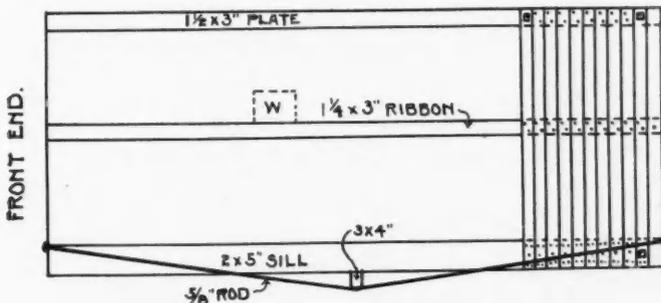
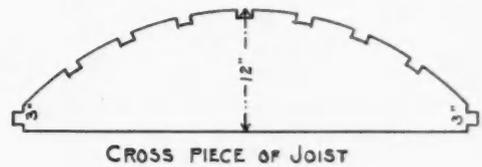


FIG. 4.

and ribbons. The tie rod can catch one end at the top. The sills should be made out of some light and tough wood, such as red elm, except the ends, which should be of oak. The siding should be 1/2-inch ceiling, unless the weight is not to be considered.

The joist, roof crosspieces, or carlines, should be set about 3 feet apart and made out of 1-inch lumber, except for the ends, which should be thicker—about 1 1/4-inch or better. The roof supports or purlines should be about 12-inch centers and made of 1 1/4 by 1 1/2 inch stuff, and should run the full length of the house without splicing.

The roof should be of common 3/8-inch matched ceiling, free from knots and thoroughly dry. These boards will conform to the shape of the roof and should be thoroughly nailed. Use battens about 2 1/2 inches wide. All parts should be put together in thick white lead paint; and then give the whole



CROSS PIECE OF JOIST

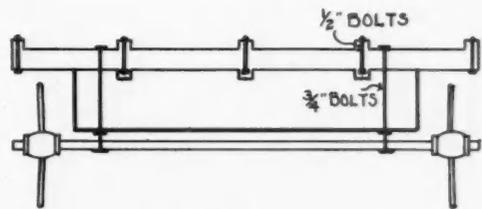
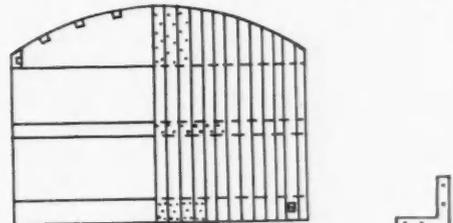


FIG. 5.

a good coat of paint. The roof can be covered with any good water-proofing material.

Now a few words about the inside. Fig. 7 represents a convenient way for inside furniture. The beds and table are hung on hinges so that they may be turned up against



END VIEW
FIG. 5.

FIG. 6.

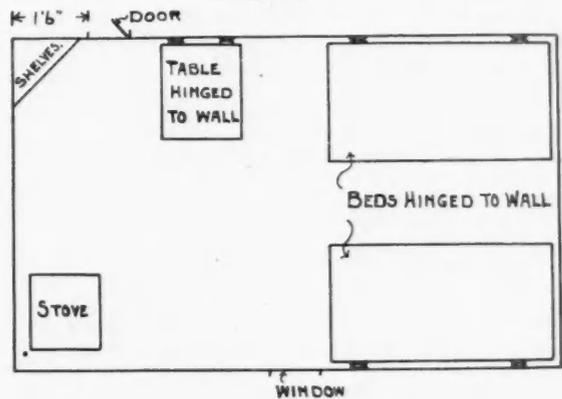


FIG. 7.

the wall and fastened with a hook when not in use. The legs are fastened on with small hinges, which allows them to swing in place when the furniture is let down.

W. A. DONALDSON.



To Lay a Tight Barn Floor

To the Editor:

Herculaneum, Mo.

In reply to Mr. J. F. Houchins' letter about his barn floor, I will agree with him that his method is all right, but I think it would prove to be expensive in the course of a few years.

I would recommend that he lay a rough floor on his joists, and put on this floor 4 or 5 inches of good concrete, well put down, not leaving more than 25 square feet in one block, using 1-inch expansion joint filled with pitch. This will keep the floor from cracking and will also be water-tight. There should be a gutter just behind the horses, and the floor to have at least 1/2-inch fall to each foot. The floor should not be troweled smooth, but left rough, except gutter; put on this concrete (after it has been down six or seven days) about 2 inches of clay. Wet it thoroughly and tamp lightly into place. Clay is the best material that I know of to stand horses on.

J. W. DUGAN.

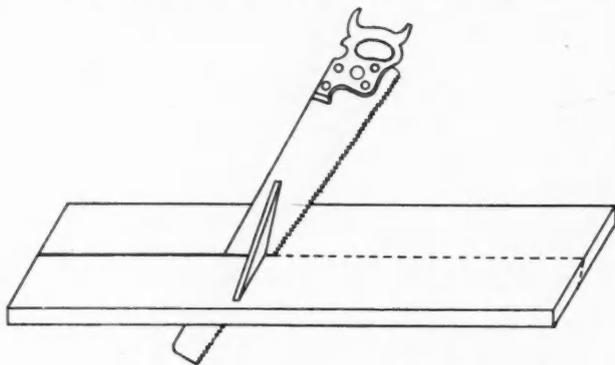
Device for Bevel Ripping

To the Editor:

Martinez, Cal.

Enclosed you will find an illustration of a little trick that I happened onto while at work. As it works very well and saves lots of unnecessary work when beveled ripping is wanted, I would be glad to have some of my fellow workmen and readers of the AMERICAN CARPENTER AND BUILDER profit by this simple idea.

I have found it hard to rip a long board perfectly true to bevel, but with this little arrangement, I find it very easy. The device required is simply a little block cut on the re-



quired bevel that the board is to be ripped. By holding the block against the saw, as a guide, an even slant or bevel can be had the full length of the board. This comes in very handy for ripping saddle boards or hip boards for a roof; and by running over with a jointer, the bevel is perfectly and easily retained.

FRED H. UPHAM.

Plan for a Trussed Roof Garage

To the Editor:

Deland, Ill.

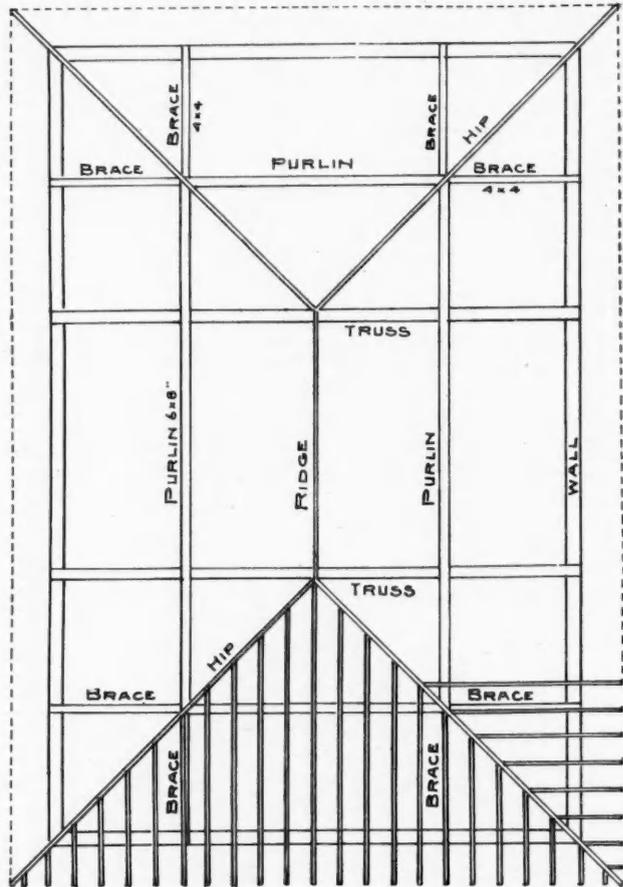
Will some one of your staff who is a good roof framer, submit an idea of the following building? A garage, 40 by 60 feet, made of concrete blocks and to have a hip roof. What we want is to have a hip roof trussed so as to do away with supports through the building and yet be as light and inexpensive as possible. Would like to see a drawing of proposed plan.

R. O. COPELAND.

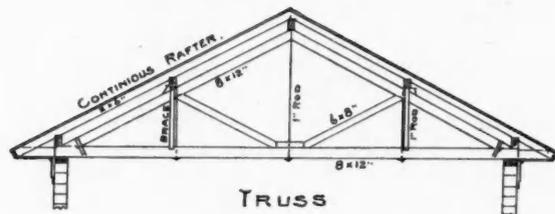
Answer: The size of the building, as suggested, is a very convenient size to roof up nicely, as will be seen in the accompanying roof plan. Being 60 feet in length, it will require but two trusses through the middle, which will place them at 20 feet from each end so that the hips will catch the peak of the trusses, as shown. Purlins can be run at the central point of the rafter lengths and braced from the chord of the main trusses and from the walls, as shown in the section.

We note that cement blocks are wanted for the outer walls, and herewith we submit an elevation as a suggestion of treatment. The window frames are made to work to the size of the blocks rather than the blocks to the frames. In this the blocks are supposed to lie 12 and 24 inches. The large door

is planned for 10 feet wide, including the frames; and the windows are 3 feet wide, with frames included. This would leave 3 feet between the openings, thus avoiding all unsightly fitting of the blocks to the frames where they have to be chipped off at the ends, thereby causing uneven lengths by



ROOF PLAN



TRUSS



ELEVATION.

not having taken due consideration in laying out the work. Note too, that caps for the openings are avoided by letting the frames extend up to the frieze. This makes an inexpensive construction and at the same time gives a very neat appearance. Any height of block can be used, as best suits the individual taste, but as we said before, whatever dimension block is used, plan to work the full length and height of

same to avoid patching up around the frames. Remember, misfits can be avoided at the start, but never—well, hardly ever—at the finish.

How to Make a Hall Clock

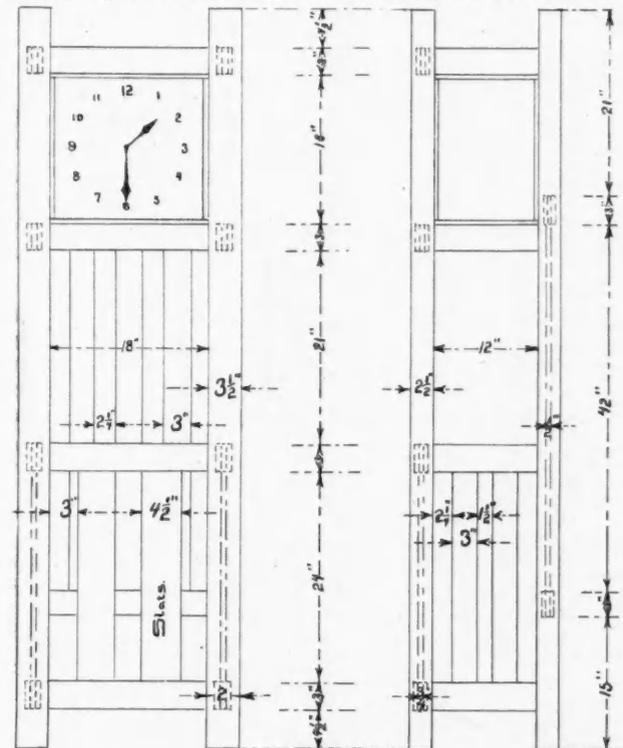
To the Editor: Oak Park, Ill.
 I have been a very interested reader of your departments of handicraft work, "Manual Training," and "The Home Workshop." This is how I made recently, during spare time, a hall clock, along lines suggested in your articles. It is a piece of furniture, so it seems to me, that is well worth making.

The wood needed is:

	Wide	Thick	Long
4 pieces	3½ inches	2½ inches	7 feet
6 pieces	3 inches	2 inches	1¾ feet
8 pieces	3 inches	2 inches	1¼ feet
4 pieces	3 inches	½ inch	2 feet 2 inches
3 pieces	3 inches	½ inch	3 feet 8 inches
2 pieces	12 inches	¼ inch	1½ foot
1 piece	18 inches	¼ inch	1½ foot
1 piece	½ inch	⅜ inch	6 feet
1 piece	½ inch	⅜ inch	5 feet

All this wood should be purchased the size stated in the bill of material and should be planed and sandpapered on all sides.

The four pieces 3½ inches wide, 2½ inches thick and 7 feet long are to be used for the four posts, the two front ones having eight mortises on the inner sides, and the two back



posts having only six. The mortises should be 1½ inches deep and 3 inches long and ¼ of an inch wide. (See drawing.)

The six pieces 3 inches wide, 2 inches thick and 1¾ feet long are to be used in connecting the two front and the two back posts.

The eight pieces 3 inches wide, 2 inches thick and 1¼ feet long are used to connect the two back posts to the two front posts. All of these pieces have a tenon 1½ inches long, ¾ inch thick and 2 inches wide.

The four pieces 3 inches wide, ½ inch thick and 2 feet 2 inches long are the slats which are tenoned into the cross pieces 1 inch deep at the side of the clock.

The three pieces 3 inches wide, ½ inch thick and 3 feet 8 inches long are the three slats used at the back of the clock.

The two pieces 4½ inches wide, ½ inch thick and 2 feet 2 inches long are the slats used at the front of the clock.

The two pieces 12 inches wide, ¼ inch thick and 1 foot 6 inches long are to be used for the paneling at the sides where the works are to be placed.

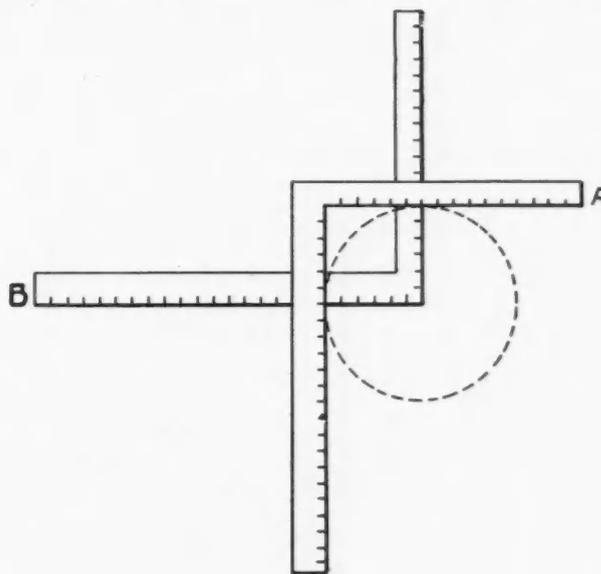
The piece 18 inches wide, ¼ inch thick and 1 foot 6 inches long is to be used for the face of the clock. These three pieces are to be fastened to the frame by tacking them to the thin strips ½ inch wide and ⅜ inch thick.

STANLEY B. FURBECK.

To Find the Center of a Circle

To the Editor: Beaver Crossing, Neb.

I am sending you a sketch of how to quickly locate the center of a circle, which is more simple than I have seen before. Place the square, as at "A," with the inside of the tongue and



blade touching the circumference, and make a dot on the circumference exactly where the tongue and blade touch it. Note the exact figures on the square. Then place square as at B. Using outside of square and placing the figures noted on tongue and blade on the dots, make a dot at the heel of the square and you have the exact center.

As it is so simple, I believe it will be valuable to some readers of the AMERICAN CARPENTER AND BUILDER, which I believe is the best paper in the world, of its kind.

J. W. LATTIMER.

Seasoning Red Oak

To the Editor: New Baltimore, Mich.

I have been a charter member of your paper, and I would like to have you tell me through your paper how long it would take to kiln dry green red oak ready for inside finish of a house, also how long it takes to air dry same in sheds.

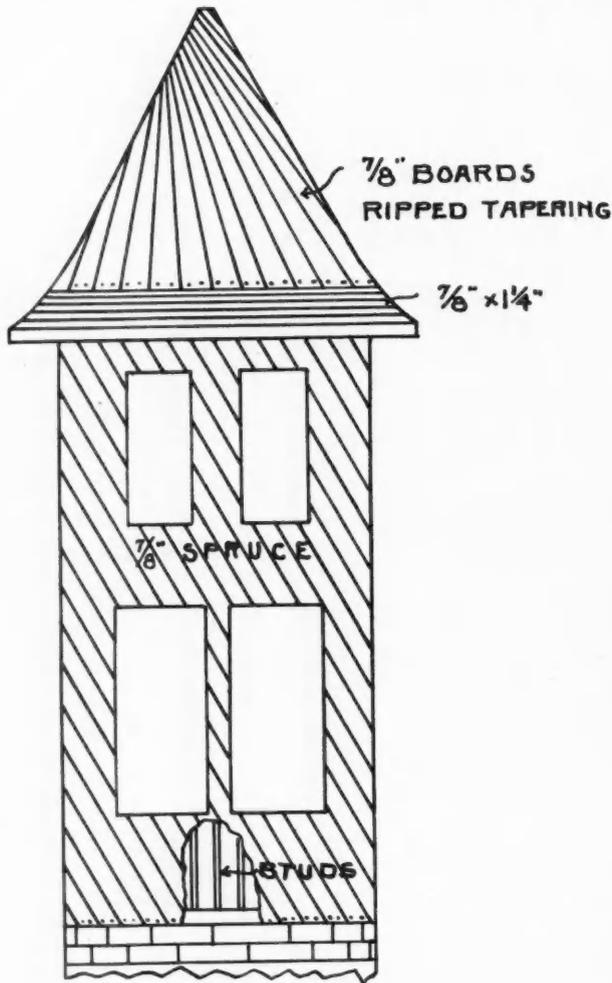
HENRY HABARTH.

Answer: To thoroughly kiln dry oak lumber for inside finish or cabinet work takes three to four weeks in the kiln. To dry it in the air and have it really fit for this work would take at least eighteen months. In the old countries they dry it in the air from three to five years before using in cabinet work and interior finish. It can be what is termed air dried in three or four months, but it is not thoroughly enough seasoned for this class of work until it has stood about eighteen months; and even then it is better for a little kiln drying before using.

J. CROW TAYLOR.

To Board a Circular Tower

To the Editor: Amherst, N. J.
 For the benefit of my brothers, I am sending this sketch, showing a strong and quick method of boarding in a circular



tower, or bay window of small radius. The sketch will explain itself.
 J. L. ALLEN.

Up-to-date Lumber Sheds

To the Editor: Mason, Ohio.
 We have just incorporated a new lumber company, capital \$25,000, and it is necessary to have some up-to-date lumber sheds.
 We expect to carry a complete line of building materials, and think it best to shed all of the different materials. Would

like for someone, through the next issue of the AMERICAN CARPENTER AND BUILDER, to give some idea of a plan for this purpose. Our lot is 325 feet front north, by 300 deep, with a switch on the east.
 A. E. BAYSORE.

Answer: We know of no better way than of a system of sheds with driveways, as shown in the accompanying section. As many sheds can be had as wanted to properly care for the whole stock of lumber. The driveways can have sliding doors so that the whole can be securely closed at night, or in stormy weather. The lighting can be by skylights over the driveways and by windows in the gable ends. The sheds should be of sufficient height to have a deck in which to store the lighter material, such as moldings, siding, etc. If it is preferred, the roof could be a flat roof for gravel, with sufficient pitch only to shed the water properly.

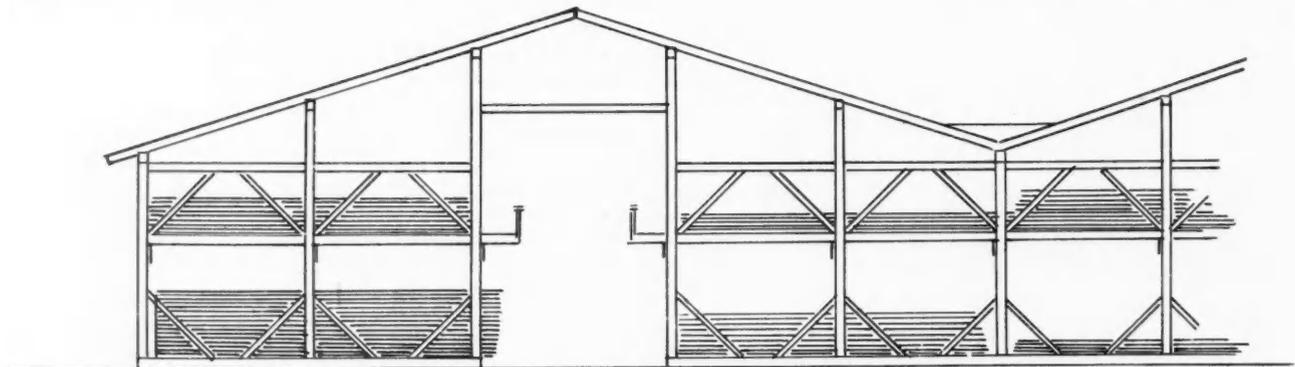
This is a good subject, and perhaps some of the readers will come forward with ideas as to what an up-to-date lumber yard arrangement should be.

Good in Case of Fire

To the Editor: Stewartsville, Ind.
 I am sending you a rough sketch of a barn plan that I drew. It is only for the ground plan, but you can get a good idea



of the arrangement. I think that it is a good plan and a very handy one and in case of a fire, a person can get in from all sides and thereby has a much better chance of saving his stock. I shall be pleased to see this published in the AMERICAN CARPENTER AND BUILDER, as it may be helpful to some one that is going to build. I am an old subscriber and I want to see the magazine keep on growing as in the past.
 CHAS. N. AMICK.



CROSS SECTION.

A Farm House

To the Editor: Partridge, Kan.

I have just received my February issue of your valuable paper, and can assure you it is always received and read with great interest. Although I have been in the contracting and building business for several years I get a great many pointers in that line, as well as the making of blue print plans, which I do on a small scale—mostly for buildings that I build myself. I never expect to get to know so much on these lines that I cannot learn something from the AMERICAN CARPENTER AND BUILDER.

I enclose a picture of a farm house near this town built for



T. L. Metcalf. It may be of interest to some of your readers. The first floor has kitchen, pantry, bath room, bed room, dining room, parlor and reception hall, with open stairway leading to second floor. On this floor are four good sized bed rooms with closets. Interior finish is of yellow pine, hand dressed, scraped and sandpapered, finished with wood stains and two coats of prepared wax. Parlor, reception hall and stair are in mission oak; dining room, bed room and kitchen in weathered oak; bath room and bed rooms in silver gray. The house cost, with full compressed air water system and gas light, \$3,600.00.

J. S. RIGG.

Church Heating Troubles

To the Editor: Dallas, Iowa.

I would like to have some information in regard to installing a hot air heater in a church. The room is 36 by 40 by 20 feet in the clear, with a class room 18 by 20 by 16 feet in the clear. How large a heater should I get; also what about a cold air pipe from the outside? The heater which we have now has never given satisfaction. The hot air only passes through pipe directly over furnace.

Any information you can give will be greatly appreciated. This is something new to me, and I want the new furnace put in so it will give the best of satisfaction. Please let me know as soon as possible.

Will say that I would not do without the AMERICAN CARPENTER AND BUILDER at double the price.

ROY E. HIXENBAUGH.

Answer: It would be impossible, from the data given, to advise you exactly what size furnace would be required, as they vary greatly in size according to the quality of furnace, and the conditions it must work under. Never use outside cold air. In some states the outside air can be utilized for the furnace, but in the northern states it is most advisable to run the fresh air duct, or rather cold air, from the hall vestibule. Unless the furnace is burnt out, you may be blaming it without reasonable cause. We judge that the furnace must set in a pit and that the ground on either side is about one foot or two feet from the floor, therefore not allowing enough room for proper size heat conductors from furnace to register in back part of room, which is the longest run. If such is the case, it would be necessary to excavate the ground a little deeper, and make the required room

for a larger conductor. The same may be the case with the other two hot air pipes which do not heat, or there may not be cold air supply enough to the furnace to make up for the hot air taken off.

Why not put in a small steam heating plant?

PERRY WEBER RATHBUN.

Design for Mr. Benson

To the Editor: Danville, Pa.

I see by the January number of the AMERICAN CARPENTER AND BUILDER that Wm. H. Benson wants a design for roof and porch to suit his floor plans. So I have made a rough sketch which may suit him. Of course he can arrange the



windows and doors to fit his plan. This is a new design of my own; I'm using this roof plan on about all the houses and barns I build, and everyone thinks they are fine.

I would build with four gables; put center of gables at center of building. This makes a very showy roof. The side walls need not be over 12 feet from bottom of sill to top of plate.

JAMES F. WELLIVER.

Accessories for Morris Chair

To the Editor: Defiance, Ohio.

Can you give me the name and address of firm or firms, from whom I can purchase the irons used on the backs of Morris chairs to adjust the back; also cushions for seat and back of same, and springs used in the manufacture of box seat dining room chairs?

Can you tell me if there is any rule to go by in putting door butts on doors?

H. A. WEST.

Answer: Irons such as are used on Morris chairs to adjust the backs can be purchased of any up-to-date hardware firm. If the local firms should not carry them they would probably be glad to send for them.

Cushions for the seat and back and springs for box seat chairs can be purchased of the upholsterers or of some furniture house that does upholstering. Cushions are made in stock sizes, but special sizes will be made up on short notice.

There is no special rule as to the placing of door butts. It is customary, however, to place the lower butt somewhat farther from the bottom than the upper is from the top. On a six-eight door the writer usually makes the distance from the floor to the butt 11 inches; while the top of the upper butt is placed 7 inches from the top of the door.

IRA S. GRIFFITH.



PRACTICAL TRADE APPLIANCES

Sharon Door Hangers and Tracks

The Sharon Hardware Manufacturing Company, of Sharon, Pa., are now making a specialty of barn and warehouse door hangers. These are made with all the care and attention to detail that have made the products of this company so favorably known to the trade. They are sold at the lowest price possible for strong and reliable goods.

The Sharon flexible door hanger No. 1 is their standard, and we can recommend it for any and all doors. The reinforced frame gives it twice the strength of the ordinary swing hanger, as it supports the axle and relieves the strain on the cover. The axles are galvanized to prevent rusting and are fitted with roller bearings, which insures free and easy running. The drop strap, being connected over the center of the rail, gives an even bearing on the axle; and with the short clevis projecting down on the inside, clamps the door and holds it rigidly in its place. The door can swing out to any desired position without causing any strain on the hanger or rail, and the hook under the rail prevents it from ever coming off.

Other high-grade door hangers made by this company are the Penn Trolley door hanger No. 5, the Plain door hanger No. 7 and the Common door hanger No. 9. They also make

a satisfactory line of door tracks. The Sharon track No. 10, the N. Y. track and the Penn Trolley track No. 15 are well known and can be highly recommended.

The Pocket Rule "Life Preserver"

Carpenters and mechanics know that most of the rules they buy are never worn out. They are lost out of their pockets or fall out, down through the rafters or metal frame work of the building, and are broken. There is a little device that has just been invented by an ingenious western mechanic, which does away with this unnecessary loss of rules. It is called the Pocket Rule Life Preserver, and is all that its name would imply. It is being manufactured and placed upon the market by the Safety Rule Holder Company, of St. Joseph, Mo. Their advertisement on another page of this paper will be of interest and value to every reader of the AMERICAN CARPENTER AND BUILDER.

Miracle Pressed Stone Company

It was with considerable interest that the representative of the AMERICAN CARPENTER AND BUILDER was shown through the large concrete block manufacturing plant of the Minne-

AS EXCELLENT AS A YALE LOCK

The Yale & Towne Mfg. Co., makers of the world renowned Yale Locks, have purchased twenty 18-inch Burt Ventilators for use on their new building.

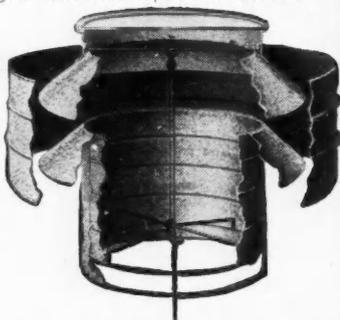
Burt Combination Skylight Ventilators

They are the most powerful and efficient ventilators made. They are strictly high-grade in workmanship, efficiency and material.

Each Burt Ventilator has a patented sliding sleeve damper, which can be adjusted to any degree by a special attachment, and is held permanently without tying cord to hook, nail or post. The glass top Burt's make fine skylights and admit the light whether open or closed.

Send for our new 96-page catalogue, giving fine illustrations of Mills, Shops, Factories, and Residences where Burt Ventilators are in successful use.

THE BURT MFG. CO.
500 Main Street
AKRON, OHIO



Notice Sliding Sleeve Damper (patented). Furnished with flat wired glass, up to and including the 72-inch size. Metal Tops furnished if desired.
Geo. W. Reed & Co., Montreal, Sole Manufacturers of "Burt" Ventilators for Canada.

Give Your Shoulders FREE PLAY

Don't make them sore and tired by wearing the old-style rigid-back suspenders, which tug, strain, and chafe with every move you make. Get a pair of



President Suspenders

and learn what **real** suspender comfort is. The sliding cord in the back of President Suspenders (which is not found in any other suspender) permits them to "give and take" with every motion of the body. They rest lightly upon your shoulders and allow you perfect freedom of movement. The Extra Heavy Weight, made especially for workers, outlasts several pairs of ordinary suspenders. Light and medium weight for dress wear. Extra lengths for tall men. Every pair sold with the maker's guarantee—satisfaction, new pair or money back. If your storekeeper cannot supply you, we will, postpaid, upon receipt of price, 50c. Get a pair today.

THE C. A. EDGARTON MFG. CO.
739 Main Street : : : SHIRLEY, MASS.

Porcelite Enamels

Answer every requirement for finishing cement surfaces

The Enamel with the Twenty-Year Record

For testimonials, references, samples, address

The Thomson Wood Finishing Co.
Philadelphia, Pa.

Do You Know.... System?

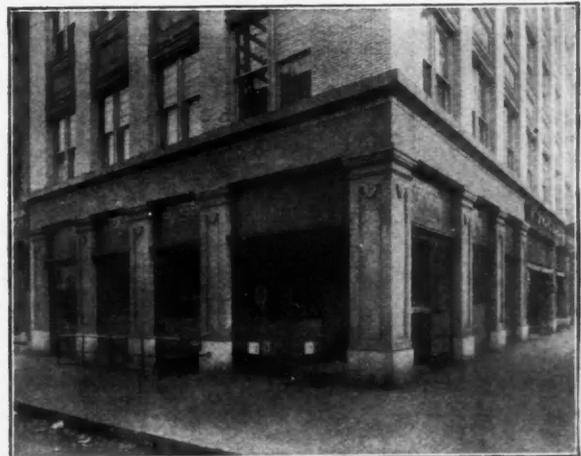
The 20th Century Merchant does—he uses it daily in his business. But does he know its meaning as applied to

Store Front Construction.

THE ARCHITECT has a full supply of practical knowledge which if applied in the selection of materials will safeguard the **BEST INTERESTS** of his **CLIENT** and thereby render his greatest service.

If the selection of materials is so important is not the service rendered measured entirely by the quality and adaptability of those materials?

"KAWNEER" No. 30 Metal Sash provides a perfect **SYSTEM** of ventilation and drainage. "KAWNEER" No. 5 and 10 Corner Bars, No. 7 Division Bars, No. 26 Transom Bar and the **SIXTY-THREE** architectural metal mouldings employed in our various designs of **BULKHEAD CONSTRUCTION** and jamb and sill construction form the most complete and serviceable **SYSTEM** and afford the greatest possible degree of protection to plate and prism glass.



Measured with whatever standard you choose, the

Kawneer System

will be found superior. Its **COMPACTNESS, DURABILITY** and **EFFICIENCY** are features which characterize our **SYSTEM** and contribute liberally to its success.

"It stays and pays"

Write our nearest office for price list. B

KAWNEER MFG. CO.

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| London, Ont. | Sioux City, Ia. | Houston |
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| Milwaukee | Philadelphia | San Francisco |
| Indianapolis | | Los Angeles |



SURETY BOND

INSIDE EACH ROLL OF

CONGO ROOFING

With the 3-ply Congo Roofing sold hereafter there will accompany each roll a Guarantee Bond, issued by the National Surety Company, insuring to the purchaser a good roof for ten years at least. The bond covers that space of time—but we are very confident that with the ordinary care and attention called for Congo will last much longer.

Congo is so thoroughly durable, reliable and altogether satisfactory that we have no hesitation in offering our customers this security.

Congo has achieved for itself a reputation as the "never-leak" roof, which it sustains through all the vicissitudes of weathers and climates.

This bond is issued as a proof of our belief in Congo and the National Surety Company stands back of it and back of every roll of Congo made. We know its worth and usefulness and want everyone who has a building to roof over to know the satisfaction of a Congo Roof.

To-day is the time to write for a sample and full information regarding this special offer.

UNITED ROOFING AND MFG. CO.

Successor to Buchanan Foster Co.

555 WEST END TRUST BLDG., PHILADELPHIA, PA.
CHICAGO SAN FRANCISCO

apolis PRESSED Stone Company, of Minneapolis, Minn., the photograph of which is shown on this sheet.

Practically everything needed for the manufacture of concrete material of any kind is manufactured somewhere in this huge building, which is three stories high, and in which there are over 40,000 square feet of floor space, devoted entirely to Miracle efforts, and over 150 men are kept constantly employed. The basement of this building is used mostly for storing their castings, sewer pipe molds and their ring sheet metal work. On the ground floor is their blacksmith shop, their planers, lathes, shapers, etc., for heavy work. On the

Voltz Giving Satisfaction

The merits of the Voltz all-glass store front, made by the Voltz Manufacturing Company, of St. Joseph, Mo., as well as the satisfaction assured by the use of that system which "holds with grip of iron—yet with a touch of velvet" is well testified to by the attached letters, one from the supervising architect and the other from the superintendent of the Duhamel-Ackerman Company, whose large store was equipped some time ago with the Voltz front:



second floor of this building is an iron department, drill presses, emery wheels, etc. On the third floor is their pattern shop and their tool room. This pattern shop by the way is a marvel of completeness, it having everything requisite that might be used in a huge plant, where nothing but patterns are manufactured, and the size of the tool room was another thing that surprised the representative.

This factory is complete in every detail, and not only the factory, but the office, where all their large business is done, is just as complete as is the factory. System predominates over all. Just as a well-oiled piece of machinery runs smoothly, each cog fitting into the other with mathematical elasticity, so is the factory office run.

It stands to reason, that with such an equipment, the Miracle PRESSED Stone Company are in a position to make good goods at a right price.

Their catalogue is very complete, showing practically everything they manufacture, together with hundreds of photographs of different styles of houses that have been built with Miracle machines. This catalogue tells about their complete line and every man should have a copy of this catalogue before him. It contains 150 pages splendidly printed, and can be had for a very small sum of money. If at all interested in the concrete block business, this book is one of the best investments you can make.

Rapid City, S. D., Sept. 23, 1908.

Voltz Manufacturing Company, St. Joseph, Mo.

Gentlemen: We are pleased to inform you that the metal sash bars placed in our building by one of the members of your firm are proving very satisfactory. The job was completed in a workmanlike manner, and many people have commented on the up-to-date appearance of our new building. The bars, while light, are strong and durable, there being no wood in any part of them to rot or decay. We consider them far superior to wooden fronts, as very little if any light is excluded by the framework.

This, we believe, is one of the largest fronts in the states, the same being 14 feet in height and 245 feet in length. Trusting that you may meet with the success that your metal fronts and workmanship merit, we are, Yours respectfully,

DUHAMEL-ACKERMAN Co.,

Per J. G. Lampert.

Rapid City, S. D., Sept. 14, 1908.

Voltz Manufacturing Company, St. Joseph, Mo.

Gentlemen: The front which you placed in the Duhamel-Ackerman Company building, of this place last June, is satisfactory in every way. The bars are light, yet very strong. We have had strong winds several times since you installed this front, and although it is 14 feet in height and 245 feet in length, it did not affect it in the least. I have specified and installed several of your fronts, and before specifying your bars for this front, I thoroughly examined all the bars on the market, but I found none that compared with yours when

LUMBER AND BUILDING MATERIAL

Special Offer to Contractors and Builders

Buy From Us
at **WRECKING
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CHICAGO HOUSE WRECKING CO.

THE OPPOR-
TUNITY OF A
LIFETIME

IMPORTANT! Send Us Your Lumber and Building List for Our Estimate

Satisfaction Guaranteed.

**Send Us Your Lumber Bill
for Our Estimate!**

**100,000,000 Feet New
Lumber at Wrecking Prices**

We urge you to send us your carpenter's bill for our estimate. Have him make up a list of every single item you will need and send it on to us for our prices. We guarantee to go over it carefully and itemize it fully and to send you a clear concise statement of just what we will furnish and the prices will be so low as to secure your order. You can include in your list of material everything needed; that means even plumbing and heating material.

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

FREIGHT PREPAID OFFER

We make our quotations Freight Prepaid. That means delivered free of all charges to your railroad shipping point. No trouble with the Railroad Companies for you. We assume every possible risk. We guarantee safe, sound and prompt delivery and if any material reaches destination damaged, we make good at once and assume all your claims against the Railroad Company.

We don't ask for money in advance. You can buy without sending one cent of money with your order. All we require is a guarantee as to your responsibility. Money refunded if material is contrary to our representation. We have a capital stock and surplus of over \$1,000,000.00. We refer you to any bank or banker anywhere. Or you can write direct to the Great Stock Yard Bank, The Drovers Deposit National Bank of Chicago.

We guarantee absolute satisfaction. We mean every word of that. We want your business only on a square business-like basis. We will deal honestly and fairly with you. If you buy any material not fully up to our description, we will either refund the purchase price or exchange it for correct material. This company has a capital stock and surplus of over One Million Dollars. We refer you to any Bank or Banker anywhere. Write to any commercial agency or ask us for names of people who have bought their lumber from us recently and we will send you copies of hundreds of letters received by us daily. Our best advertisement is the vast number of satisfied customers.

WRITE TODAY FOR OUR LOW LUMBER PRICES
Ask us to send you our latest lumber price list. It will be sent you so clearly and plainly that you can tell at a glance just what our quotations are. The grades are clearly defined. No attempt to humbug you on quality. We want to furnish you just what you buy. We want you to be able to say you "buy your lumber and building material from us and get value for your investment." That's the way we built up this business. That's the way we intend to continue to build. We require your patronage and good will. Outline your needs and we will make you a reply so convincing and clear that you can't help but give us the business.

Everything Used in Building Sold at 20 to 75% Below Regular Prices

DOOR BARGAINS!



One lot of 5,000 brand new 4-panel doors of standard manufacture, size 2 ft. 6 in. x 6 ft. 6 in., 98 cents each; size 2 ft. 8 in. x 6 ft. 8 in., \$1.05 each. We carry a complete stock of brand new doors and can supply any size or style desired. High grade front and vestibule doors in many handsome designs, the best that can be made by the use of the latest improved machinery and skilled workmen, at prices ranging from \$2.75 to \$20.00. These doors are glazed and beveled plate glass, or can be furnished with fancy lace pattern, double strength glass. They are strictly "A" quality and are made up in first grade Pine, Oak, Birch and other kinds of wood.

California Redwood sash doors, strictly first class and glazed clear double strength glass, 2 ft. 6 in. x 6 ft. 6 in., \$2.40; 2 ft. 8 in. x 6 ft. 8 in., \$2.50. Double sash doors for stores and vestibules strictly brand new, "A" quality White Pine, 1 1/2 in. thick, glazed double strength glass, size 5 x 7 ft., pair, \$9.00. All sizes in stock up to 6 ft. and 8 ft. Interior doors of all descriptions. Brand new, O. G. 4-panel White Pine doors, 2 x 6 ft., \$1.22; 5-crown panel O. G. White Pine doors, raised panels both sides, strictly brand new, size 2 ft. 6 in. x 6 ft. 6 in., \$2.07 each; size 3 x 7 ft., \$2.80 each.

HIGH GRADE MILL WORK!



Send us for an estimate on mill work. We are in a better shape to quote low prices than any other concern on earth. Our stock is not bought in the regular way. We purchase at Sheriff's Sales, Receivers' Sales and Manufacturers' Sales. Our customers get the benefit of such purchases, which are invariably under the market. We can supply mill work of any kind and character. We can furnish according to specifications, whether regular or special stock is desired. Send us a memorandum of your requirements and we will make you an estimate. Note some of our low prices: Strictly No. 1 Colonial Porch Columns, complete with cap and base, 6 in. in diameter, 8 ft. long, \$1.70 each; 8 in. in diameter, 8 ft. long, \$2.25 each. These are the regular 1-1/2 joint staved columns and are well made in every way. Fancy turned Porch Columns, 4 x 4 in., 8 ft. long, 85 cents each; 5 x 5 in., 8 ft. long, \$1.00 each; 6 x 6 in., 8 ft. long, \$1.50 each. Fancy turned Porch Newels, 35 and 40 cents; Stair Newels of many handsome designs, \$1.90 and up.

WINDOW BARGAINS!

Windows from 25 cents up; 5,000 used windows from various wrecking operations. Some of these windows are very fancy and will be sold at less than half the price of new ones. New Windows—We have a complete stock of brand new windows which we are able to offer at extremely low prices. Note the following quotations on new stock: 2-light, 1 1/2 in. check rail windows, size of glass, 16 x 20 in., at 69 cents each; 20 x 20 in., 8 cents each; 22 x 24 in., 90 cents each; 24 x 28 in., \$1.10 each. Four-light, 1 1/2 in. check rail windows, size of glass, 10 x 20 in., 70 cents; 12 x 20 in., 78 cents; 14 x 20 in., 96 cents; 15 x 30 in., \$1.47. Eight-light windows, size of glass, 8 x 10 in., 57 cents; 10 x 12 in., 75 cents. Twelve-light windows, size of glass, 8 x 10 in., 75 cents; 10 x 12 in., \$1.03. Three-light Cellar Sash, 35 cents; Barn Sash, 43 cents; Stall Sash, 32 cents; Attic Sash, 59 cents. Large stock of storm sash at prices ranging from 70 cents up. Special—500 brand new Hot Bed Sashes, 3 x 6 ft., glazed with 4 rows of clear 3/4-in. glass, at \$1.60 each; in lots of one dozen or more, \$1.55 each.



READY ROOFING 50% PER SQ.

At this price our "Gem" brand ready roofing, 108 sq. ft. to the square. The best bargain ever offered. Only 3,000 squares for sale. No supplies included at this price. We do not recommend the purchase of this grade; read our wonderful offer on the best roofing in the world.

Rubberized Galvo Roofing!

The highest grade Roofing covering manufactured. Guaranteed absolutely equal or superior to any other kind manufactured. Positively covered by a binding guarantee that protects you in every way. It is the regular grades manufactured. It is not in continuous lengths to each roll. A roll of roofing usually comes in the continuous piece, but the roofing we are offering is put up two to five pieces to a roll. That, of course, does not affect the quality at all. In fact, some people prefer it, as it is easier to handle. We furnish plenty of material, so that all laps can be properly taken care of. We are not allowed to tell you the name of the manufacturers for confidential reasons. If there is any roofing better than this, we haven't heard of it. Our price 50 per cent below what is usually asked for roofing of similar quality. One ply, per square, \$1.25; two ply, per square, \$1.40; three ply, per square, \$1.75.

Send for Our Free Mammoth Illustrated Catalog No. 742

We publish a book of some 500 pages, containing a general record of our goods and showing millions of dollars worth of merchandise secured by us at Sheriff's Sales, Receivers' Sales and Manufacturers' Sales. It is a friend to every economical person. You cannot afford to be without it. It lists Building Material and Supplies, Machinery, Roofing and Wire, Structural Material, Hardware of all kinds, Furniture and Office Fixtures, Belting and Rubber Hose, Plumbing and Heating Apparatus, Pipe, Valves and Fittings, Wire and Manila Rope, Electrical Apparatus, Safes and Vault Doors, Tanks, etc., etc. In addition to this General Catalog we publish a "BOOK OF PLANS." It shows illustrations of modern houses and barns; gives illustrations from life as well as floor plans. It explains our unique offer to furnish all material needed to construct any buildings shown in our book. You can get a complete set of plans, specifications and bill of material for \$2.00. Or, furnished free with your order. We also publish a Furniture Catalog showing handsome designs in Household Goods, Furniture and Office Supplies. Write us your wants. We can save you big money.

CHICAGO HOUSE WRECKING CO., 35th and Iron Streets., CHICAGO

PLUMBING AND HEATING!



handsome cast iron, flat rim, white porcelain enameled, brand new kitchen sinks 16 in. wide and 24 in. long with nickel plated strainer and collar for connection, all ready to install. Kitchen sinks with backs, made in one piece at prices ranging from \$7 to \$15.

Steam and Hot Water Heating Apparatus. We guarantee to save you from 30 to 50 per cent on every kind of heating jobs of every kind. Send us your blue prints and specifications for our estimate. Our plants are of the most moderate construction. Write for anything.

MIXED WIRE NAILS, PER KEG \$1.60



These Nails were on board barge sunk in the Ohio River and are more or less rusty. They are practical for use and make a fine handy assortment. Put up mixed, just as they come, 100 lbs. to the keg. Sizes from 3 to 40D. Per keg, \$1.60. Nails, straight sizes just one kind to a keg with slight surface rust, sizes 3 to 60D; also Casing Nails and Finishing Nails, all kinds; price per keg of 100 lbs., \$2.00. First-class bright, clean new Nails, 20D common, per keg, \$2.20.

White Enameled Bath Tub



\$3.00 buys a White Enameled Bath Tub, 600 "New Style" bath tubs, finest galvanized steel with the enamel baked on the inside, nicely finished on the outside, heavy wood rim, 5 ft. long. Bath Room Outfits, \$25. With steel enameled tub, polished, hardwood seat and tank, complete with nickel trimmings ready to install. Other complete outfits from \$35.00 to \$150.00. Plumbing Material of all kinds at prices that do not represent cost of production. We buy at Sheriff's and Receivers' Sales only; that's why we can undersell all. Send today for our low estimates on plumbing material.

DON'T BUY YOUR BUILDING MATERIAL UNTIL YOU GET OUR ESTIMATE

FREE CATALOG COUPON!

CHICAGO HOUSE WRECKING CO., Chicago
Cut this out and mail to us at once.

I saw your advertisement in.....
Name.....
Town.....
County.....State.....
R. F. D. No.....

Send me free of all cost your Wonderful Catalog and Building Offer, as advertised.

strength and neatness was considered, so your bars were specified and installed, and everyone who sees it admires it and says that it is the neatest front they ever saw. I shall continue to specify your bars in all of my work. Wishing you success, I am, with compliments, Yours very truly,

W. F. HALL, Architect.

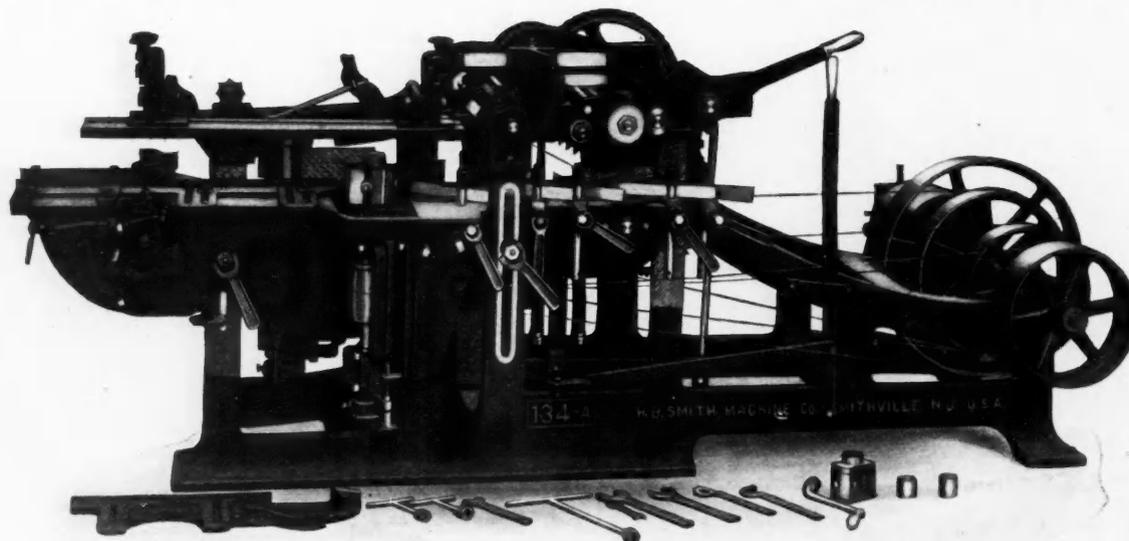
New Eight-Inch Molder

The H. B. Smith Machine Company, of Smithville, N. J., have been building molding machines for more than 60 years, some of their patents dating as early as 1847 and 1852.

H. B. Smith, the founder of the business, was conceded to be the first to cast the frames whole for molding machines, and the company have followed his example ever since because it makes rigid frames with no joints to get loose.

The early machines were designed for working soft woods which were used when Michigan supplied the bulk of white pine, but within the last ten years they have redesigned all of their molders, and have brought out an extra heavy line for working hard woods.

The 8-inch molder illustrated is a new machine of substantial design, but not of their extra heavy pattern. It is a heavy machine, however, and is very strongly driven. It may be described as follows:



The frame is cast whole and is 28½ inches wide by 8 feet long, which gives ample room for long and wide belts. The design is of strongest possible form and admits of easy access to the inside vertical head; and it also supports the table close to the under head.

The table is extra heavy, adjustably gibbed to the frame and adjusts up and down by a single screw which rests on ball bearings and is adjusted by a winch from the front. For deep work it will drop as low as 9½ inches, or by removing the outside headstock, as low as 12½ inches. When the table is adjusted to position it is then clamped firmly to the frame by two clamp-bolts, one bolt through the outside support to upper head and the other near the under head.

The cutter spindles are all made of high-carbon steel, carefully turned and ground to fit the bearings. They are 1½ inches in the bearings, and the upper and under spindles are 1½ inches where the heads go, while the side spindles are 1¼ inches for the heads. The under spindle, like top mandrel, is provided with three bearings and the head is removable without disturbing the spindle.

The feed mechanism is composed of two upper feed rolls, one 4-inch and the other 2½-inch diameter and one 4-inch roll in the table, all driven and expansively geared so as to drive in any position of the table. The two upper rolls are given independent pressure by two long coiled springs placed

within the framing. The feed shafts are 1½-inch with substantial bearing and both upper rolls are driven by a downward pressure of the gears, thereby increasing the power of the feed. There are two rates of feed, 25 and 44 feet a minute, and which are started and stopped by a lever in front. This lever actuates a friction clutch and the motion from the clutch-shaft is communicated to the train of feed gears by a very fine hardened steel automobile roller bearing chain running on milled sprockets, hence the feeds are very powerful and positive. The feeding mechanism as a whole has a screw adjustment to regulate the draw to the fence side of the machine. By raising a lever to a vertical position it lifts the feed rolls so that the stock can be withdrawn.

The cutter heads furnished with the machine are all 4-slotted, lipped and made from high-carbon hammered steel, and all are of the same cutting circle (5½-inch), thus allowing an interchange of cutters on the different heads.

The pressure bars and chip-breakers are of the latest design and all readily removable for quick access to the cutter heads. The chip-breaker to the upper head is adjustable to and from the cut and is adjustably weighted. There is a pressure foot immediately after the upper cutter, and another over the under-cutter, and these can be connected by a board or reverse molding so as to make the pressure continuous. These

pressure feet are adjusted by hand wheels. Also a spring pressure just opposite the inside vertical head, which is shown on the cut.

Equipment Supplied.—Each 4-side machine is furnished with one 4-slotted steel head to each spindle, each head having cutter-head bolts and a pair of plain knives; a chip-breaker to the outside vertical head, one cap head, and wrenches and guide shown in the foreground of cut.

Belting Required.—For top head, 14 feet 2 inches long by 4 inches wide; bottom head 18 feet 2 inches long by 3 inches wide; inside head 15 feet 5 inches long by 3 inches wide; outside head 14 feet long by 3 inches wide; and for feed 13 feet long by 2¼ inches wide. Circulars of extra heavy molders sent on application.

Raynesford's Improved Bench Stop

A new tool which every practical carpenter is likely to appreciate is the bench stop which has just been placed upon the market by Raynesford & Sons, Ellis, Kan. The stop is made of steel and has a slightly oxidized copper finish. It is 4½ inches long and projects beyond the work less than half an inch. In order to make use of the stop its barrel is inserted part way in one of the several holes in the apron of the bench, placing the jaw up and the lever to the right.

AIR-PRESSURE WATER SUPPLY OF THE ANDREWS 4 SYSTEMS

Prices from \$50 to \$1,500—Capacities 150 to 19,000 Gallons

The above estimates of the prices and capacities of Andrews Air-Pressure Water Supply systems are for single Units—that is, one tank, one pump and all the trimmings complete. In case larger capacity is wanted, either at once or subsequently, additional tank space can be installed at a low cost, and without any loss on the original investment.

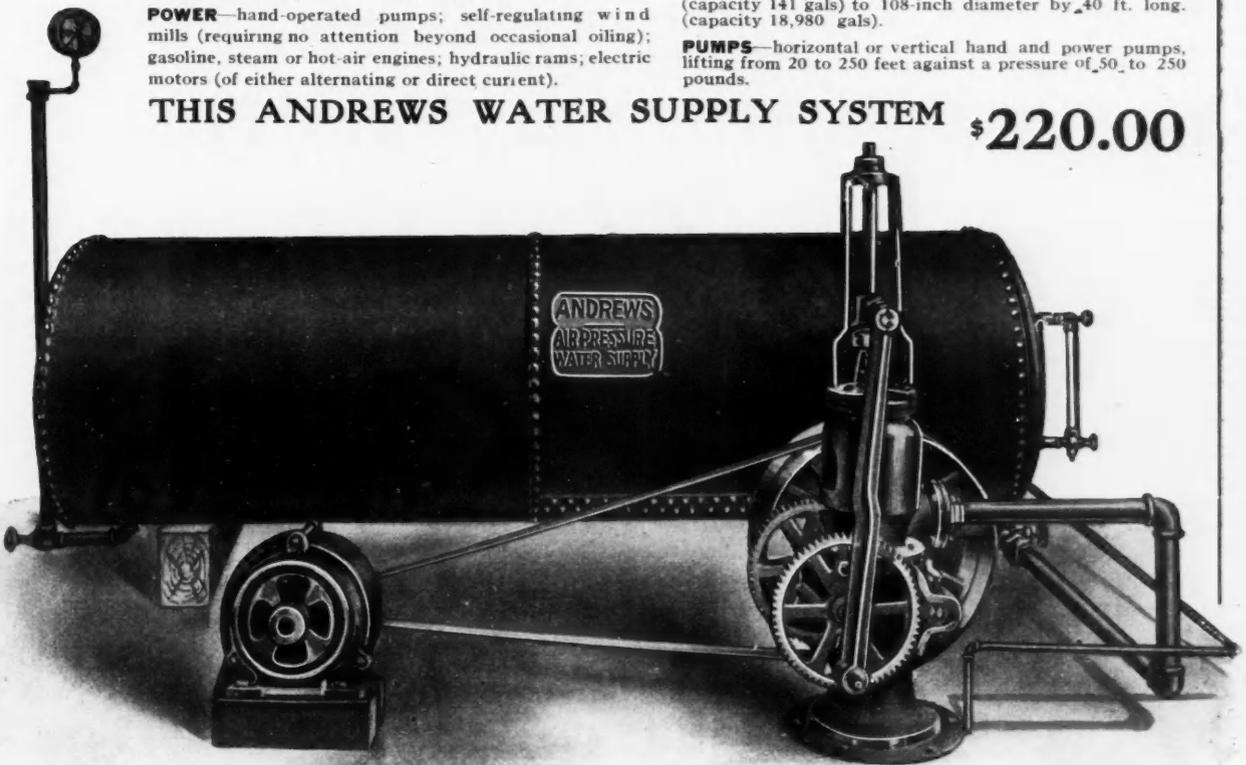
Systems of any capacity and of any pressure desired can be assured with these variable units. They are suitable for farm, country house or town. Also for buildings anywhere that demand individual water supply, as for fire protection in connection with sprinkler systems, etc.

SOURCE—deep or shallow wells, Springs, Rivers, Lakes.
POWER—hand-operated pumps; self-regulating wind mills (requiring no attention beyond occasional oiling); gasoline, steam or hot-air engines; hydraulic rams; electric motors (of either alternating or direct current).

TANKS—31 sizes from 24-inch diameter by 16 ft. long (capacity 141 gals) to 108-inch diameter by 40 ft. long (capacity 18,980 gals).

PUMPS—horizontal or vertical hand and power pumps, lifting from 20 to 250 feet against a pressure of 50 to 250 pounds.

THIS ANDREWS WATER SUPPLY SYSTEM \$220.00



Andrews Hot Water Heating Systems are sold direct "factory-to-user," being designed specially for the job by our engineers and completed at our factory ready to screw together, so that any handy man can erect.

THIS SAVES 25 to 33 per cent, as the labor cost is reduced easily that proportion; and it insures a much better balanced plant than the ordinary workman can lay out. Our engineers are constantly employed in this line of work and employ the most scientific methods.

Andrews steel boiler burns any fuel with great economy. Its extra large heating surface gives the same heat with third less fuel. All boilers are from 60,000 pound tensile strength steel, same as steam power boilers. Steam heating boilers made where special conditions require. Our rocking-and-dumping grate easily operated and suited to different fuels.

The plant also includes complete outfit of richly ornamented radiators; best steel pipe; expansion tank; Andrews Regurgitating Safety Valve; all fittings, fire cement, gold (or silver) bronze, and brush; also clinker hook, shaker and flue brush, complete as shown in this house.

Some purchasers prefer cast iron boilers which are cheaper; in accordance with this demand we sell the Andrews Peerless Cast Iron Boiler in 12 sizes. Get particulars, if you want to save money.

Plumbing Material \$120—Porcelain enamel bath tub 4½ ft. long with roll rim, nickel-plated trimmings, porcelain water closet, low down oak tan, set and lid, enamel lavatory, enamel kitchen sink; 30-gallon kitchen range boiler; granitine laundry tray, vent and waste pipe, soil pipe, traps, bends and all material to erect complete. There are no joints to wipe. Complete plans and directions for erecting.

Sewage Disposal \$100—THIS SYSTEM overcomes the main drawback to living out in the country. A cesspool is no longer countenanced by modern sanitary standards.

The Andrews Sanitary Steel Septic System works with bacteria and requires practically no attention; suitable for residences, factories, schools, etc. Built in variety of sizes of boiler steel, it is riveted and calked air and water tight; fitted with trapped inflow, automatic out-flow and suitable manholes.

Heating Bldg.
MINNEAPOLIS

ANDREWS HEATING CO.

Marine Bldg.
CHICAGO

One end of the work is then placed in the vise and the other on the barrel of the stop, the edge being pressed firmly against the work. It is then only necessary to press the lever down sufficiently to lock firmly, and proceed to work. In case a number of boards of the same width are to be edged the bench stop may be locked in the proper hole, so that the work will slip in or out readily, and then it need not be changed or moved until all the boards are edged. In this way time is saved by not having to adjust for each board separately. The manufacturers point out that in order to insure the proper working of the bench stop, care should be taken that the holes in the apron of the bench are full $\frac{3}{4}$ -inch and clean cut. A 2 by 4 must be placed behind each row of holes, securely fastened to the apron and then the several holes continued through the 2 by 4 inch piece. This is done so as to provide sufficient depth in the holes to furnish a bearing for the jaws of the barrel of the bench stop.

Coltrin Claims Attested

That the Coltrin concrete mixer is "making good" every day to the claims of its manufacturers, the Knickerbocker Company, of Jackson, Mich., showing those claims, great as they are, to be not at all exaggerated, is amply attested by such letters as the following:

Granville, Iowa, June 23, 1908.

The Knickerbocker Company, Jackson, Mich.

Gentlemen: You are to be congratulated upon putting such a superior quality of mixers on the market. The mixers we bought of you one and two years ago have had hard and steady usage, but appear to be nearly as good as new. Would not exchange them for any of the many makes we have seen.

Yours truly, GRAFF BROS.

Jackson, Mich., Aug. 13, 1908.

The Knickerbocker Company, Jackson, Mich.

Gentlemen: We have been using two of your No. 6 Coltrin

concrete mixers this season, putting in sub-base for pavements on East Main, West Main and First streets in this city. The average daily output of each mixer, working on bank run gravel with eight men to the machine, was 84 cubic yards of concrete per day of 9 hours. The work was done under the most rigid inspection and passed as O. K. by the city engineer and inspector. We unhesitatingly endorse your mixer for efficiency, durability and economy.

Yours respectfully, MILLS, BARNES & EMMONS,
Contractors, Per H. C. B.

The claims the Knickerbocker Company make for their Coltrin mixers are, in brief, as follows:

That it will at all times deliver a more perfect, uniform mixture than any other mixing machine on the market, or than is possible to do by hand.

That it will give as strong a mix with 20 per cent less cement.

That it will mix more concrete with seven men than any other machine with ten men.

That, taking into consideration the quality of the mix, the number of men employed, the power required, the expense for repairs, the Improved Coltrin concrete mixer will deliver concrete at 25 per cent less cost per cubic yard than any other mixer on the market today.

The "Advance" Hoist

One of the most meritorious of the many labor-saving devices that appeal to the building trades, is the contractor's hoist built by the old and well-known Holton & Weatherwax Company, Ltd., Jackson, Mich. This firm has been in business continuously for 46 years and enjoys an extensive and well-earned reputation as a progressive and thoroughly reliable house.

Aside from their wholesale and retail business as dealers in

SEA GREEN & PURPLE SLATE

MAKES

Roofs That Never Wear Out

Sea Green and Purple Roofing Slate is the *only* roofing material that *never wears out*. That affords spark and fire protection, pure cistern water, reduces insurance rates and *never* requires a dollar for paint or repairs—the kind of roofing your customers are demanding and are going to buy—either through you or the *first man* in their neighborhood who can supply their wants.

CARPENTERS AND BUILDERS

Don't you see the demand that is developing in your locality for a strong, durable roofing material? Something that will give faithful service without yearly paint and repairs expense? Don't you *realize* that with very little effort you can establish a very profitable growing Slate Roofing Business? One that can be conducted in connection with your present line without added trouble or expense. We want you to take up Slate Roofing this spring and handle our **Sea Green and Purple Roofing Slate**. Write to us at once for delivered prices and *free* book of instructions. Don't delay. **Write today.**

AMERICAN SEA GREEN SLATE CO., Box 36, Granville, N. Y.



Let Us Send This Package Free

—Consisting of a Bottle of Johnson's Wood Dye—A Bottle of Johnson's Electric Solvo—A Sample of Johnson's Prepared Wax—Set of Panels Showing Our Different Colors on Wood—And Our Valuable Text Book on Painting, Decorating and Home Beautifying.

We want you to know the value of Johnson's Preparations for the treatment of wood. That is why we are making this big and generous free offer to every reader of this magazine.

Just fill out this coupon, send it to us, and we will send you this large package containing all the articles mentioned above—a free supply, ample enough to prove in your own work, or in your own home on a piece of furniture, how superior Johnson's Preparations are.

Johnson's Wood Dye is a dye *in fact*—not a mere stain that merely coats over the surface. It is a deep-seated dye that becomes part of the wood, brings out its full artistic beauty. Can always be depended on to be a true shade.

Select any shade you wish from this list:

- | | | |
|---------------------|-----------------------------|---------------------------|
| No. 126 Light Oak | No. 128 Light Mahogany | No. 121 Moss Green |
| No. 123 Dark Oak | No. 129 Dark Mahogany | No. 122 Forest Green |
| No. 125 Mission Oak | No. 130 Weathered Oak | No. 172 Flemish Oak |
| No. 140 Manilla Oak | No. 131 Brown Weathered Oak | No. 178 Brown Flemish Oak |
| No. 110 Bog Oak | No. 132 Green Weathered Oak | |

Write today for this free package.

Simply fill out the coupon—be sure to give your paint dealer's name and address today.

S. C. JOHNSON & SON
RACINE, WIS.

"The Wood Finishing Authorities"

Please Use this FREE COUPON

I accept your offer of Free Booklet Edition A, C, B, 4 and samples of Johnson's Prepared Wax, Electric Solvo, Wood Dye, shade No.

Name.....

Address.....

I usually buy my paints at store of Name..... Address.....

FLIES ALWAYS LIGHT
ON THE SCREEN



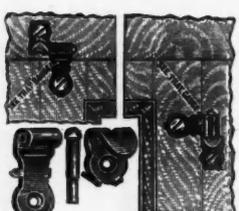
WATROUS NO. 17
ONLY SIDE HANGER MADE.

BIGGER PROFITS

FOR THE
CONTRACTOR
Who Uses The
**WATROUS
NO. 17
SCREEN
HANGER**

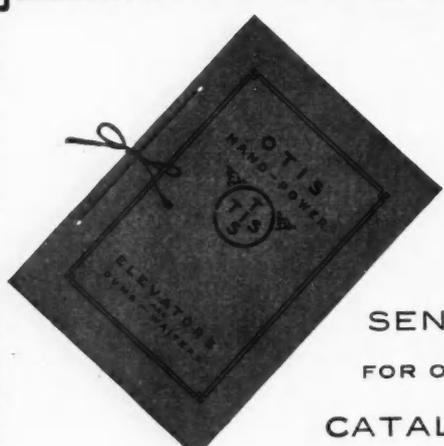
These same pieces, arranged to suit, will hang either a full or a half screen from either the top or side. Storm sash should be hung from the top, but this is the only way to hang a screen.

Only four screws to set instead of twelve, a saving in labor of two-thirds. A gauge mark locates the piece instantly, and makes mistakes impossible. A carpenter who has bought other hangers, could afford to throw them away, buy the Watrous No. 17, and make more money on the job. Mounted working model sent free postpaid to dealers or carpenters. Write to-day.



E. L. WATROUS MFG. CO.

DES MOINES : : IOWA

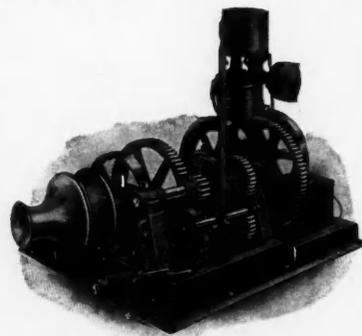


SEND
FOR OUR
CATALOG

STORE ELEVATORS
\$75 TO \$95

OTIS ELEVATOR COMPANY
NEW YORK CHICAGO SAN FRANCISCO
AND ALL PRINCIPAL CITIES

machinists and engineers' supplies, the Holton & Weatherwax Company, Ltd., operate a large machine shop in connection

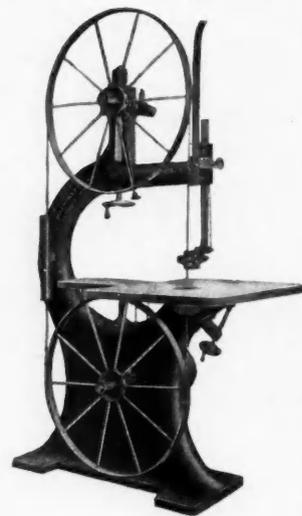


with iron and brass foundries, that give employment to many skilled mechanics.

The Advance hoist is built in their own shops in its entirety, under the watchful eyes of experienced foremen, and is a product that meets every requirement for which it is designed. The Advance is not a large and unwieldy apparatus; it weighs, without power attachment, 825 pounds, but is so well designed and constructed that it handles easily and expeditiously, loads ranging in weight from 200 to 2,000 pounds. The Advance operates two cages simultaneously, the loaded bucket going up as the empty descends. It is entirely self-contained, being very rigid, with a one-piece iron base and constructed of the best material throughout. One of the notable features of the hoist is its economy of operation, due to the system of gearing employed. This feature alone means a great saving in cost of operation over other hoists. The Holton & Weatherwax Company, Ltd., guarantee this hoist for a period of one year against all defects due to faulty material or poor workmanship. They assert that in the Advance they have the best all around hoist on the market, and an inquiry addressed to them at Jackson, Mich., will undoubtedly bring plenty of data to support their claim.

New High Speed Band Saw

The Willebrands Machinery Company, 160-162 West Larned street, Detroit, Mich., are showing herewith their new



improved 36-inch high-speed band saw which is giving such universal satisfaction wherever installed. The frame of this machine is a very heavy cored casting with ample floor space. The wheels are built up, that is the hub is bell-shaped to allow the bearings to extend beyond the center of the wheel. The spokes are of solid steel and the rims of the wheels are of steel, electrically welded, and then ground perfectly true and covered with an endless rubber band.

The table is of iron and is tilted by means of the small hand wheel shown. It has outside bearing beyond loose pulley. The guide post carrying guide is counterbalanced. All parts are adjusted from working side of machine. They also have 20-inch, 27-inch and 32-inch band saws, as well as a large variety of woodworking machines.

Large descriptive circular will be gladly sent on request.

A Heavy-weight Roofing

Granite roofing is unique in the fact that it weighs 140 pounds to the roll, or nearly double the weight of the ordinary three or four ply. It is a more permanent and substantial covering than the ordinary roofing, being especially valuable for railroad and factory use where the areas are very large and cost is an important consideration. Granite roofing is not, however, a high-priced roofing, and is easily within the



**" THIS IS
THE ROOFING
THAT NEEDS
NO PAINTING "**

THERE was a time when everybody bought roofings that required painting. It was the regular thing to do. In fact there was nothing else to do, for all roofings were "smooth surfaced" and required painting regularly to keep them from deteriorating.

Now there is *Amatite*, an improvement over painted roofings, having a *real mineral surface* imbedded in pitch—making a kind of flexible concrete.

This mineral surface needs no painting. The waterproofing material, Coal Tar Pitch, is the greatest enemy to water known. It is the base of many waterproof paints. Only in a paint the pitch is diluted and made into a thin film, whereas the *Amatite* waterproofing is *solid pure Pitch*—two layers of it. It would take something like a dozen coats of pitch paint to equal in thickness that upper sheet of pitch in which the *Amatite* mineral surface is buried. And under that heavy sheet of pitch is a layer of wool felt and under that another sheet

of pitch, just as thick as the outer one. And below them all is another layer of strong felt. That makes two roofs in one.

If the storms wore away the mineral surface and dug through the pitch and destroyed the felt, they would still be only half way through. And if the weather then removed the next sheet of pitch, you would still have left a final layer of felt—nothing more or less than an ordinary smooth surfaced roofing which could keep off the rain very nicely if painted every year or two.

But as a matter of fact, the weather never gets past that mineral surface securely gripped in its matrix of pitch.

The mineral surface is there to stay. No painting—no bother—no further expenses after the roof is once laid.

We should be glad to send you a free sample of *Amatite*, and you can see for yourself how much better it is than the smooth surfaced kinds.

Address our nearest office.



BARRETT MANUFACTURING COMPANY

New York Chicago Philadelphia Boston St. Louis Cleveland Pittsburg Cincinnati
 Kansas City Minneapolis New Orleans London, Eng.

reach of everybody who wants to protect a shed or farm building in a thorough manner. Its sea-grit surface makes painting or coating entirely unnecessary. Moreover, it is easily laid and is proof against fire. Sample will be sent free on request by postal to the makers, Eastern Granite Roofing Company, New York, Chicago, St. Louis.

Ashby's Designs for Schools and Libraries

An architectural book of more than ordinary interest and value has recently been prepared and issued by G. W. Ashby, architect, Medinah building, Chicago, Ill. Those who are familiar with Mr. Ashby's work—and their number is indeed very great—will welcome this collection, consisting as it does of 95 designs of modern public school and small library buildings selected from a large number of designs and representing the best and most popular types of such building.

It has been said that Mr. Ashby's designs of schools and libraries display a composition of utility, durability and good, pure architecture without any "gingerbread." Judging from the work shown in this new book, this statement is true. The school boards and building committees in all parts of the country who desire to build a small or medium sized building, practical and economical in construction and arrangement, yet at the same time carefully planned and architecturally pleasing, will welcome such work as this.

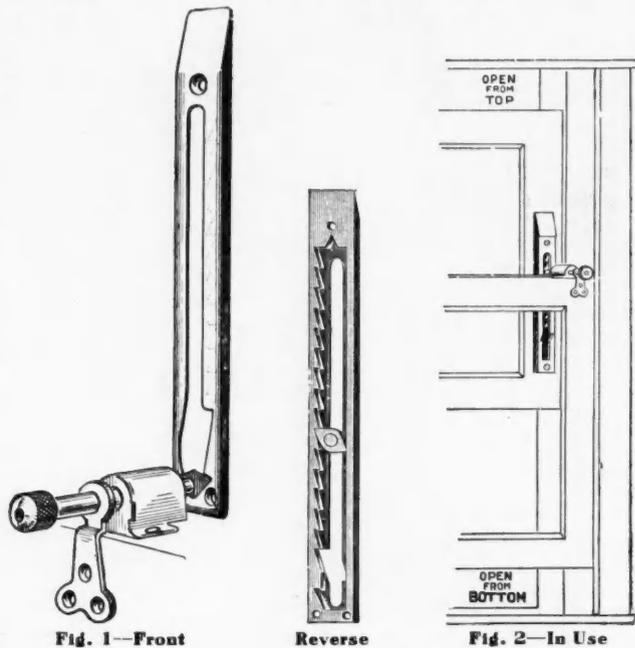
The book is prepared in a way to be very serviceable; 100 pages, size 9 by 12 inches; heavy enameled paper. The perspective and floor plans of each design are given, together with a brief description of materials entering into its construction. Any special features are also pointed out.

From the variety of buildings shown it is evident that there is no class of work too large or too small to receive the careful, personal attention of this well-known school architect.

The book will be sent to parties interested in the erection of a school building or library for which plans have not yet been procured.

Climax Automatic Ventilating Sash Lock

The Climax Lock Ventilator Company, Ellicott Square, Buffalo, N. Y., is manufacturing the ventilating sash lock herewith illustrated. Fig. 1 shows front view, also reverse



of the lock, and Fig. 2 its location upon a sash. The lock permits ventilation by securely locking the sash partially open, either at top or bottom or both. It is impossible to open the window from the outside by putting an arm through the openings, or by the use of a knife blade, clock spring or tool, because it is necessary to close the window entirely

Mantels for Every Purpose

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

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

Lorenzen Mantels are Ahead

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

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

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

Dollars for Contractors and Owners in Our Proposition

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

LORENZEN "The Mantel Man"
315 N. Ashland Avenue. Chicago

LORENZEN
PAYS THE
FREIGHT

Everything for Furnace Work

On Free Trial *Until Jan. 1st 1910*
At Our Expense

OUR story is quickly told. We will send you a **Hess Steel Furnace** and complete heating outfit, including pipes, registers, fittings and everything needed, for from \$25 to \$100 less than you can buy from dealers. You may place the purchase price in the hands of your local banker who will hold the money until January 1st, 1910, while you test the heater.

If the test is not satisfactory to you in every way, you may return the goods at our expense and have your money back, we to pay the cost of removal and freight charges both ways. Ask us more about it. There's money in it for you. Our great co-operative plan makes you a partner in our success. We explain this with every estimate. This offer also applies to heating equipments for all buildings. We manufacture and sell from our factory direct to you and loan you the tools free with which to install the outfit.



Our No. 45
"Leader" Steel Furnace
Heats 7 or 8
Rooms

Price \$49.00

Delivered to any Station East of
Omaha & North of the Ohio River
Pipes and Registers Extra

Special Heating Plans Free

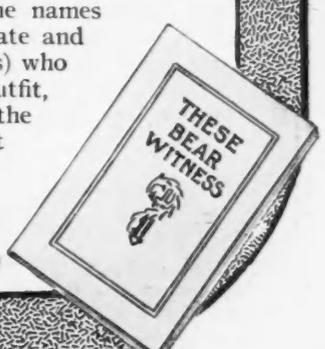
Send us a rough sketch of any building you wish to heat and, without any charge or obligation on your part, we will have our experts prepare a simple, clear plan which you can easily understand, showing every detail of the furnace, pipes, registers, etc., in their proper places, with the exact cost to you of the complete equipment.

Write For These Booklets

Our booklet "**Modern Furnace Heating**" clearly explains principles that cannot be ignored if the heating of any building is to be accomplished perfectly and, at the same time economically. This booklet is written so anyone can easily understand the diagram illustrations and principles involved. It covers the entire heating proposition thoroughly and contains heating information of much value.

The booklet "**These Bear Witness**" gives the names and addresses of hundreds of people in every state and territory (many of them, perhaps, your neighbors) who have, and are using, the Hess Steel Furnace and outfit, and to whom we refer as having found our furnace the best in heating capacity and most inexpensive in first cost and fuel consumption.

THESE BOOKLETS ARE FREE.
WRITE FOR THEM TODAY.



Hess Warming & Ventilating Co.
920 Tacoma Bldg. Chicago

before it can be opened wide. This can be done, when desired, by letting the bolt head travel over the enlarged opening in the slide. The lock allows a window to be opened 6½ inches from top or bottom, without sacrificing security. By turning the knob to the right as far as it will go the lock will draw the sashes tightly together. It is stated that the lock cannot be pried off with a burglar's jimmy, also that it will withstand a pressure of over 1,000 pounds. It is explained that the lock is so simple in operation that a child or stupid servant can use it, as a turn of the knob opens it and the closing of the window locks it. The lock can be attached to old or new sash without cutting or marring the sash, only a screwdriver being needed.

The Proper Way to Surface Floors

Has it occurred to the average carpenter and contractor that within the last few years a separate and distinct line of business has been evolved in the building trades, which has grown faster and is more profitable than anything else connected with the business, and which is within the reach of any man, and will make him several times as much money as working by the day? That is surfacing floors by machinery. It is now used by the leading hardwood floor companies and contractors from ocean to ocean.



It is a well-known fact that scraping wood tears up the grain, leaving the pores open and a rough finish unless rubbed down with sandpaper. It is practically impossible to scrape an old floor on account of the sand and grit in it; it is a slow, laborious and expensive manner to get a good floor. Countless contrivances have been put on the market, and their merits exploited, but their skeletons are rusting in the junk graveyard.

But over six years ago the American Floor Surfacing Machine Company put on the market the first and most practical machine for doing this work on a paying scale, and which has set a standard for this class of work.

The machine has two drums covered with sandpaper, driven 600 revolutions per minute in opposite directions by an electric motor, which also propels the machine 35 feet per minute. The machine has a dust collecting device, sucking the dust and cuttings into a sack.

Its work and construction are fully guaranteed as its cutting is all done with garnet and sandpaper, and is the only machine that one man can do more and better work with than 20 men can do by hand. With it one man has done over \$1,850.00 worth of work in six weeks.

This machine lately surfaced the fine strip and parquetry floors in the tower of the Metropolitan building, in New York, where nothing but the finest work would pass inspection.

It will pay every carpenter or contractor who wishes to increase his income or establish a business of his own to write the American Floor Surfacing Machine Company, Toledo, for their free book, "Surfacing Floors as a Business."

Universal Woodworker

The accompanying cut shows the famous Universal woodworker, manufactured by the Sidney Tool Company, of Sidney, Ohio, arranged for motor drive, either for direct or alternating current. They also equip the woodworker with



CARBORUNDUM



The Carpenter or Mechanic whose tools are always sharp can do more work and better work in a day with less real labor.

CARBORUNDUM SHARPENING STONES

Put a keen lasting edge on a tool and do it more quickly than any other sharpening stone.

ORDER A TRIAL STONE FROM YOUR DEALER---DON'T TAKE ANYTHING ELSE

Just to introduce you to Carborundum let us send you our POCKET STONE—in neat case.—BY MAIL 15 CENTS—

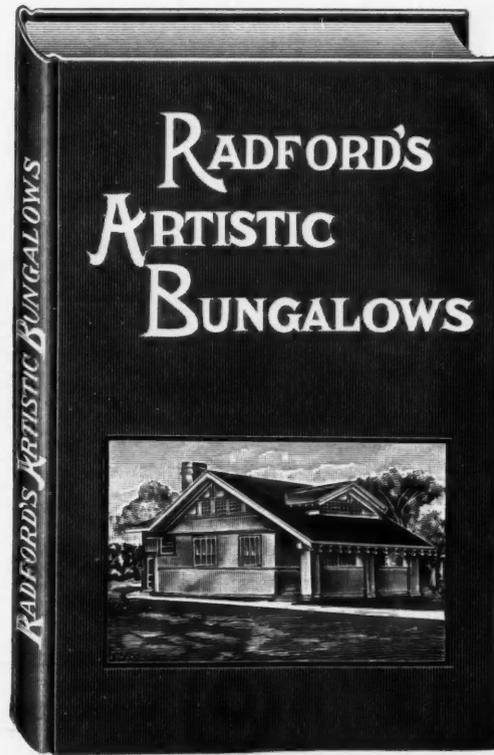


THE CARBORUNDUM COMPANY

Niagara Falls, : : : : : New York

Radford's Artistic Bungalows

ILLUSTRATING THE BEST IDEAS IN BUNGALOW ARCHITECTURE
JUST OFF THE PRESS



SEE THIS BOOK BEFORE BUILDING YOUR BUNGALOW

It is on account of the great attractiveness of the Bungalow and the great demand for buildings of that construction by home builders that this volume is offered to the public. In its preparation a vast amount of deep study of the subject and tireless energy have been given by the most eminent architects of the country, so that in this volume is condensed the best thought on Bungalow construction that it is possible to secure. The home builder will find here every style of Bungalow that has proved itself worthy of being classed with that form of construction, so that any taste may be suited.

This handsomely bound book, size 8x11 inches, contains the perspective views and floor plans of 208 Bungalows suitable for any climate and for every material. The illustrations show the Bungalows exactly as they will appear when built and the floor plans show the size and arrangement of the rooms. Estimated cost of construction ranging from \$500.00 to \$5,000.00 in price.

This book is printed on the best enameled paper from the finest half tones and zinc etchings (more than 600 half tone cuts and zinc etchings being used to properly illustrate it.)

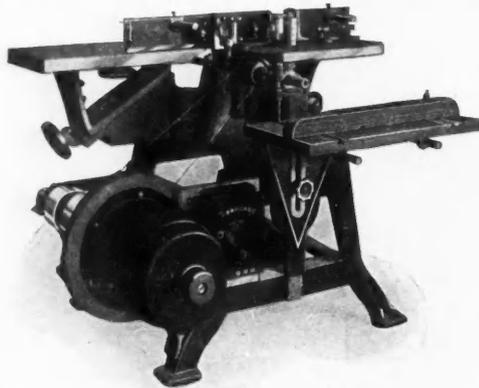
PRICE, POSTPAID, \$1.00

The Radford Architectural Company

185 E. Jackson Boulevard,
CHICAGO, ILL.

261 Broadway,
NEW YORK, N. Y.

electric drive with the band-saw attachment; this makes a very convenient machine to be moved about for use in large



contracts. It can be connected to any current and will save the contractor many dollars. They have given special pains to this machine, giving it the very latest improvements most convenient for the contractor and builder. It is a dependable machine and guaranteed by the manufacturers to do absolutely perfect work. You will find their ad. on another page of this journal, which will illustrate to you the different styles in which they build this famous woodworker. This is one of the most up-to-date and improved machines on the market, and it will pay you to write them for their catalogue.

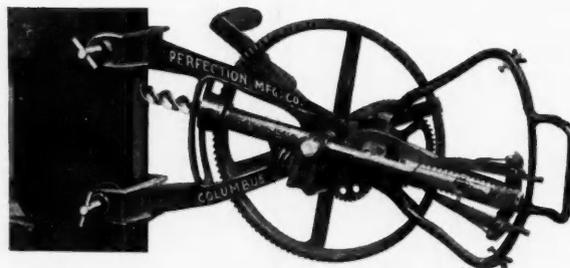
Hurley Company Extension

The business of the Hurley Machine Company, of Chicago (manufacturers of the "Thor Electric" washer and wringer and the "Little Giant" floor scraper), has increased to such an extent that their present quarters are not large enough to turn out machines fast enough to meet the demand. They have rented the Hotz & Rehm building, northeast corner of Clinton and Monroe streets, which they will occupy after

May 1st, and will then be in position to take care of their rapidly growing business. In their new place they will have the largest floor space for the manufacture of electric, power and hand washing machines in the world. They will also have a large and beautifully equipped display room, showing washing machine, ironing machine, dryer, etc., in fact, a complete home power laundry.

Perfection Mortising Machine

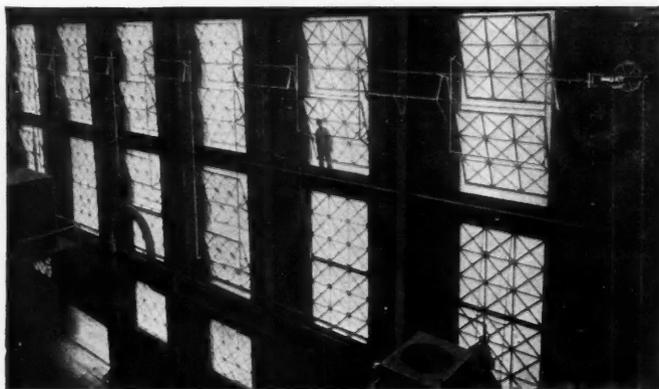
The Perfection Manufacturing Company, of Columbus, Ohio, are said to have reached perfection in a machine to make the mortise for door locks. Weight, 12 pounds. It is said to be the only machine made with which anybody can make a perfect mortise without the use of any other tool, and it is guaranteed to do this in three minutes for any size lock described. The price of the machine can be saved in mortising fifty doors, in any kind of wood, with the grain or across the grain; knots, dowel-pins or the end of panel do not interfere with the work in the least. A mortise made with this machine is more perfect than any carpenter can



make, yet a boy can operate it. The first door should be lined in the center, then clamp the machine on the door and set the indicators on the line by turning the right-hand clamp-screws, then tighten with the left-hand clamp-screws, then turn the crank until the mortise is complete. This machine

Pond Operating Device

(Patented)



Pratt Street
Power House,
Baltimore, Md.

Four lines of sash,
each eight feet
high, controlled
with one gear.

Sash operation is never difficult with Pond Operating Device. We make the special details without charge and guarantee results.

Tension Transmission is the right principle, and phosphor-bronze bearings and immersed gears make the working conditions permanent.

THE LUPTON HOLLOW METAL WINDOW is designed right and is produced by our complete organization with unequalled factory equipment. Our "General Catalogue" will convince you of its merit.

THE LUPTON ROLLED STEEL SKYLIGHT is durable and strong. The glass is not in contact with metal. The low cost of maintenance will interest you.

Write for catalogues and preliminary estimates.

DAVID LUPTON'S SONS COMPANY

WeiKel and Willard Streets

Philadelphia, Pa.

Drawing Trade to Builders

Direct Guarantees Through
Dealers to Contractors
and Builders Insure
Satisfaction to
Consumers



Look for
the Record
Behind the Roofing

The contractor is responsible for the roofing he uses. Good roofing makes pleased clients and more business. To protect the consumer we give guarantees through dealers to contractors and consumers as follows: 3-ply for 15 years; 2-ply for 10 years; 1-ply for 5 years.

Warning

This roofing cannot be bought of "mail-order" or "catalogue houses" and the public are warned against cheap imitations sold under names closely resembling our brand.



FORD'S Galvanized Rubber Roofing

Is made by a special manufacturing process and from special materials. The manufacturing process involves extreme heat and enormous pressure. It is the only process that insures a perfect prepared roofing.

The materials used, under this process, *must* be of extremely high quality. So every ounce of materials that enter into the manufacture are examined before being used. Thus we know the quality is there. Thus we are certain that every square foot of Ford's Roofing is *good*. That is why we take no risk in making broad guarantees.

Roofs Covered with Ford's Roofing Are Safe

Where a good roof is needed, use Ford's Galvanized Rubber Roofing. It's the cheapest roofing, wearing and service-giving qualities considered, at present on the American market. It is "different" to other "cut-price" prepared roofings. Not much different in price but in the quality. The Ford quality is the standard quality.

Send for samples, particulars, dealers' names and important literature.



FORD MANUFACTURING CO.,

163 West Washington Street, CHICAGO

makes a perfectly clean mortise, straight in at the top and bottom, and a straight back wall.

Each machine is provided with a special 11/16-inch bit, which is used for all standard locks; any size will be furnished on application. It is the easiest bit to keep in order ever invented. The greater part of this machine is malleable iron. The main frame is fitted with clamps adjustable to any thickness of door from 5/8 inch to 2 1/4 inches, and provided with fiber washers that prevent the marring of the door.

The main gear meshes in small gear on bit-shaft, thus giving high speed to the boring motion of the bit. The main gear also operates the compound gears, which in turn operate the cam that carries the bit up and down through the mortise. When the bit is at the top of mortise the feeding mechanism at the rear end of machine bears against the small screw in lower rear corner of frame, thereby forcing the bit into the wood 1/16 inch, and the wood is cut out as the bit travels down through the mortise. At the bottom of the mortise the bit is again forced into the wood 1/16 inch by the feeding mechanism bearing against the small screw in upper rear corner of frame, and cuts out the wood as before, as it travels up through the mortise. By continuing this operation any depth mortise can be cut to 3 1/2 inches. This makes the machine entirely automatic, and the shaft bearing in rack is provided with ball that takes the end thrust and relieves all friction. A mortise cut with this machine holds the lock straighter and firmer and leaves the door stronger. The construction of the machine is very simple. It is easy to take apart, and cannot be put together wrong.

A Weather-proof Column

A weather-proof column—the kind of column you have been looking for—a column which absolutely cannot split, check, rot or open up at the joints! The Union metal col-

umn—being made entirely of metal—cannot be subject to any of these deteriorating effects which have been the ban of wood columns. Their durability and strength, with the added fact that they cost no more than good wood columns, will recommend Union metal columns to you.

The ventilated cast iron base of this column keeps the porch floor about it perfectly dry, thereby eliminating the constant annoyance from both rotted columns and floors inevitable with wood columns.

Union metal columns are made in all the usual designs up to 40 inches in diameter and 35 feet in length. Their clean-cut beauty is apparent from the accompanying photographic illustration. These columns have many additional advantages which it will pay you to investigate. A postal to The Union Metal Manufacturing Company, Canton, Ohio, will secure full information on them.



A Much-traveled Suit Case

Anybody can buy the labels of the big hotels of every country nowadays, and decorate their traveling bags to impress people with the fact that they are great would-be travelers. But when you see a case adorned as the one pictured here, which has really earned its decoration through world-wide travel, it is something of a curiosity, and it becomes intensely interesting to trace through its labels the progress of its journey from city to city and country to country. This

Luxfer Prisms

Turn Darkness *Into* Light

Luxfer Prisms take the light of the sky and focus it to any part of the building.

Luxfer Prisms flood the dark places with daylight and render artificial light unnecessary.

The secret of the successful results that always follow Luxfer Prisms is in the sharp, accurately cut angles. Sheet prisms cannot give such results; they merely throw the light on one spot—Luxfer Prisms distribute it into every nook and corner. The light rays are not merely reflected; they are scientifically directed—bent—focused. They are drawn from the sky to places they would otherwise never reach.

Contractors Can Install Luxfer Prisms

Ninety per cent of the total installations are on our principle. This is appreciable evidence of superiority of the Luxfer system. It is testimony of the fact that architects and contractors are not risking their reputation by installing imitations.

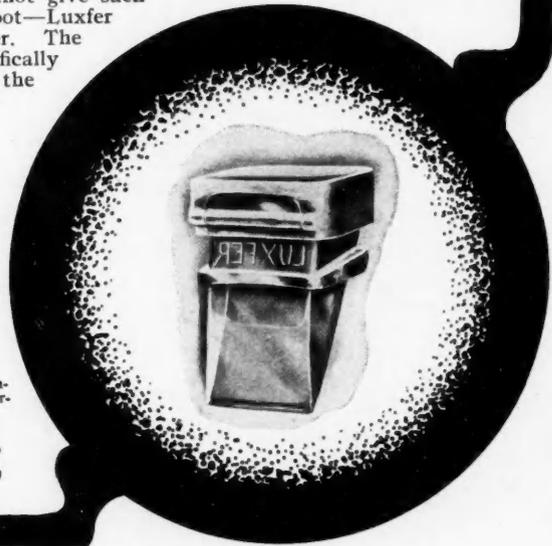
Wherever a dark room or basement exists there is a need for Luxfer Prisms. The rental value of each room is increased, while the utility of a daylight basement is unquestionable.

Contractors contemplating Luxfer Prisms can obtain ready-to-lay slabs made up to any specifications, at our shops.

Send for "Daylighting"

Drop a postal for our booklet—"Daylighting." Gives you an insight into the most advanced method of daylighting and makes interesting reading for contractors.

American Luxfer Prism Co.
1600 Heyworth Building Chicago



VULCANITE

The Roofing Star



Shines
in the
Interest of
Contractors

Sixty Years Successful

SIXTY years of experience, reputation and constant improvement is behind every roll of Vulcanite Roofing. The high standard of quality has won for it **highest honors** at many expositions; the same high standard makes it the **most extensively used roofing in the world.**

"The roofing of ultimate saving" was what somebody called Vulcanite. We thought it appropriate—discriminative contractors have thought so since. The way we insure this "long-life" quality is like this: The base of Vulcanite is a mineral rubber

compound and is positively the highest priced material used in the manufacture of ready roofing. We pay the price because the quality is there. All the felt we use is pure wool felt. We know it's **good** wool felt because we make it in our own mills. No paper or other cheap filler is used.

Vulcanite is very dense and firm—it's tough, yet as pliable as rubber. The sixty-years' test has proved it will not freeze or crack in winter, will not crumble in dry weather—will absolutely refuse to leak in wet weather.

To Contractors who use Good Roofing

Contractors are particularly requested to look for our name and trade-mark. Many manufacturers, who cannot imitate the roofing, imitate the name. The word "Vulcanite" and our Vulcan trade-mark is positive protection for contractors.

To dealers who sell it—to contractors who lay it—to consumers who use it—Vulcanite is a safe proposition. It's backed with positive guarantees. Everybody is protected and satisfied.

Fill out the coupon for literature and samples.

Vulcanite Samples

Sign and Mail this Coupon for Important Literature and Liberal Samples of Vulcanite Roofing.

Patent Vulcanite Roofing Co., Chicago

NAME _____

STREET _____

CITY _____ STATE _____

Patent Vulcanite Roofing Co.,
CHICAGO

FRANKLIN, Warren County, OHIO

Trinidad Lake Asphalt

—the time-tested weather-resister used on streets and roofs for over a quarter of a century—is the stuff that makes

Genasco Ready Roofing

Genasco is the stuff that makes your roof proof against leaks and repairs. There is no mystery about what it is made of. You know Trinidad Lake Asphalt—and you know it makes roofing that lasts.

Write for samples and the Good Roof Guide Book. Mineral and smooth surface. Ask your dealer for Genasco. Insist on the roofing with the hemisphere trade mark, and the thirty-two-million-dollar guarantee.

THE BARBER ASPHALT PAVING COMPANY



Largest producers of asphalt and largest manufacturers of ready roofing in the world.

PHILADELPHIA

New York San Francisco Chicago

The Perry

LUMBER RECKONER

It means an end to figuring. It means an end to errors. It means an end to wasted time.

For, at one glance, you learn the number of feet in a given number of pieces of lumber—of any size. The answer is positive. It's impossible to figure wrong.

The Perry Lumber Reckoner is compiled by practical lumbermen—men who used to make errors and waste time figuring, but who found a better way. A special cut index gives instant access to any desired size of lumber.

\$1.00

COST IS SAVED MANY TIMES OVER

Thousands of lumbermen use it and save its cost every week.

It contains 106 pages, is handsomely bound in leather and is of a convenient size to fit the pocket. Only costs \$1.00 and we pay postage.

Money is refunded to anybody asking — but every purchaser hitherto has valued the book more than the dollar.

Benjamin L. Jenks,
Sole Publisher
308 Euclid Avenue,
CLEVELAND,
OHIO.

Feet	Board Feet	Board Feet	Board Feet	Board Feet	Board Feet
100	100	100	100	100	100
200	200	200	200	200	200
300	300	300	300	300	300
400	400	400	400	400	400
500	500	500	500	500	500
600	600	600	600	600	600
700	700	700	700	700	700
800	800	800	800	800	800
900	900	900	900	900	900
1000	1000	1000	1000	1000	1000

suit case started from San Francisco, bound for Japan.

The first label pasted on it, however, indicates a stop at Honolulu, evidently to see how our island possessions are getting along, and then it enters the mikado's domain through the port of Yokohama. On through this progressive Oriental country it presses its way, stopping at Kobé preparatory to



breaking in upon the exclusiveness of Chinese society at Hong Kong, Singapore and Shanghai. From thence, as if homesick for its own dominions, this wonderful suit case turns westward in its course and lands at Manila in the Philippines.

Then, with John Bull's offsprings so near at hand, it drops down for a friendly visit to Australian towns, and we see it flitting about from Adelaide to Perth and from Perth to Sydney, and from Sydney to Melbourne, not even forgetting the Tasmanian towns of Hobart and Launceston. Then coming to New Zealand, here is Wellington, Dunedin and Auckland, all taking turns for a share of this visit.

Now comes a mighty leap for this cosmopolitan suit case to the far-away shores of tropical Africa.

A hearty welcome is waiting from the civilization of this dark continent at Johannesburg and Pietermaritzburg, and a fond *adieu* is given at Port Elizabeth, for another long voyage is ahead to the shores of western India, where a landing is made at Bombay. On to the Indian interior this suit case presses its way till it reaches Calcutta. Then after a brief rest it takes up the longest lap of its Oriental wanderings and takes passage for England. Here we trace it to Dover, to London and Liverpool.

After a world-tour embracing a year and a half this famous suit case now sets its face towards home and embarks for New York on the steamship Caronia, thus encircling the globe on its mysterious mission.

But what *was* its mission? What were the contents of this case?

Well, the case contained Genasco ready roofing, on an expedition to sample the nations of the earth.

This illustrates the great field that its makers have dared to anticipate for this wonderful roofing made of Trinidad Lake asphalt. And the field is big, because Genasco is adapted to roofs in every part of the world. It is not affected by extremes of temperature nor sudden changes, and it therefore doesn't crack, break, rot or leak. Genasco is made by



the Barber Asphalt Paving Company, Philadelphia, whose more than a quarter century's experience with Trinidad Lake asphalt, the weather resister from which Genasco is made, is sufficient guarantee that the roofing lasts, yet this company strengthens it with a written guarantee, and throws the weight of its thirty-two-million-dollar organization against it.

The journey of this suit case was not the first acquaintance

MASTIC ROOFING

MEANS

A Perfect Roof



We offer Special Inducements to all Contractors and Builders putting on the first Mastic Roof in every locality where it has not been introduced.

We Will Appoint Live Selling Agents

Mastic Roofing is a guaranteed product and represents the highest type of perfected ready roofing that it is possible to produce from the best materials and with the best manufacturing equipment.

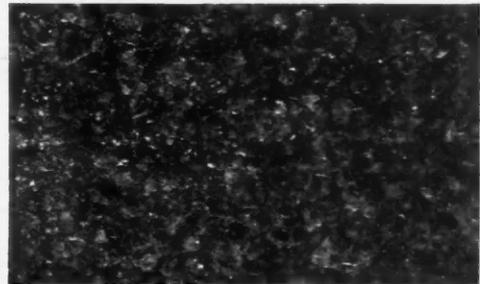
The life of any prepared roofing is determined by the quality and quantity of its coating. **Mastic Roofing** has a base of specially woven jute, for first strength, with a heavy ply of pure all-wool felt on the back as a cushion, the whole being bound together and heavily coated with 55 pounds of Asphalt Mastic to the square and having a mixed mica and sand finish on the weather side.

Mastic Roofing never requires painting because in our special process of manufacture it is coated with Asphalt Mastic equal in thickness to seven or eight coats of good paint.

Mastic Roofing is not the lowest-price roofing per square at first cost, but it is the cheapest and most economical in the end. It is laid the easiest and will out-last any other ready roofing made.

Contractors, Builders and Owners will find it greatly to their own advantage to investigate Mastic Roofing. It will cost you nothing to let us show you the "Hows and Whys" of its superiority.

Just write us now—today—and let us submit the best roofing proposition you ever received.



THE ABOVE CUT IS AN EXACT REPRODUCTION OF A PIECE OF MASTIC ROOFING 2½ X 1½ INCHES AND SHOWS THE SLIGHTLY SURFACE FINISH.

Booklets and Samples Free

National Roofing Materials Co.

EDWARDSVILLE, ILL.



TRADE MARK

Oriental peoples have had with Genasco. It has previously been used with success in Egypt, Australia, and in fact in every civilized nation under the sun. And the demand is rapidly growing.

A roofing that stands the test of world-wide weather conditions will surely withstand any kind of weather we have at home, and prove a source of economy and lasting satisfaction.

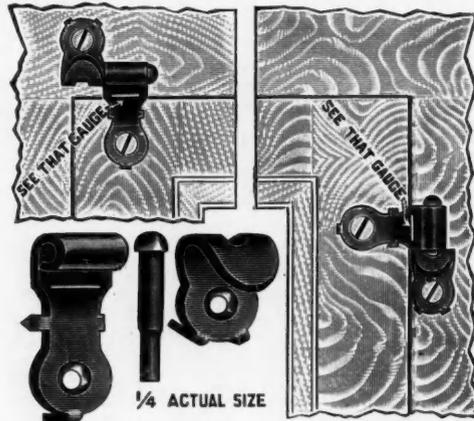
Labor-saving Screen Hardware

The E. L. Watrous Manufacturing Company, of Des Moines, Iowa, are making a strong drive on screen hardware. They make a screen hanger which can also be arranged as a take-off hinge. They advocate the use of the hanger position for storm sash, but say that all screens, when possible, should be hinged from the side on account of



greater convenience in driving out flies and washing windows.

They make their strongest claims on the labor-saving qualities of the device.



Each pair is marked with a gauge showing just where the edge of the wood ought to come, and the steel points permit quick location and accurate setting, patents on these features being owned by the makers, who claim that the time saved by them over the usual methods amounts to more than the cost of the hanger. Any carpenter knows that the big item in hanging screens is the labor. If he can cut that down, he can figure cheaper and make more money. It is a big job to set twelve screws, the customary number. With nothing to hold the piece in position the screws may start in crooked, drag it off to one side, and the piece does not fit after it is on. When a man is up on a ladder he has to handle his hammer, the screen, the screws, and the hinges, to say nothing of holding himself on, and if the hinge is set a little too far one side or the other of the joint the sash either comes off too easily or won't come off at all. With the Watrous No.

Your Success IS OUR Necessity!

We Want to Show You Why

Can you afford to figure a job of Metal Ceiling unless you are sure the cost of erecting will not exceed your estimate? Your success is our necessity because you will not buy our ceilings unless there is profit in them for you and satisfaction for your customers. Most of your success depends upon the fit.

We Have Solved the Problem

Our Double Bead Lap produces a thoroughly dust-proof and invisible joint. It is simplicity itself. Easy to fit, therefore cheapest to erect. This means profit and satisfied customers to you.

Another Secret

The great variety and high character of our Art Metal Ceiling and Sidewall Designs insure the customer's preference when shown our Catalogue. Send us plans with all measurements and we will prepare drawings of appropriate ceilings, without charge, and name you low price on all material, F.O.B. your station. Get our catalog right away.

disadvantages. Compare the cost with everlasting "NEVER LEAK" SHINGLES that remain as good as new as long as the building lasts. "NEVER LEAK" SHINGLES are cheaper.

SEND FOR SAMPLES AND BE CONVINCED

THE
Tiffin Art Metal Co.,

39 Broad Avenue
TIFFIN, OHIO

The "Never Leak" Shingle

Made on a modern scientific principle, of Apollo Vandergrift Galvanized Iron. Supersedes anything made. A sweeping statement—but read WHY.

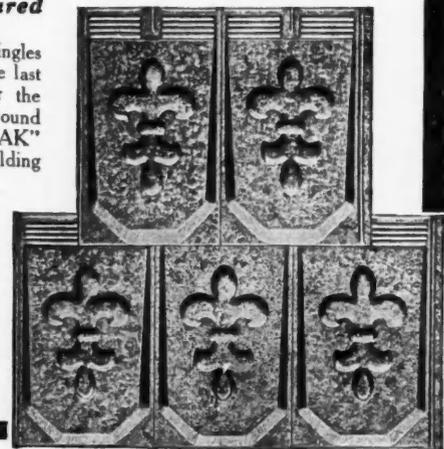
Unique Features of a Unique Roofing

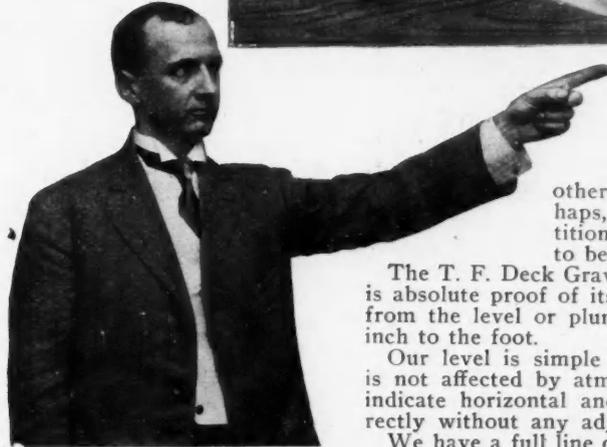
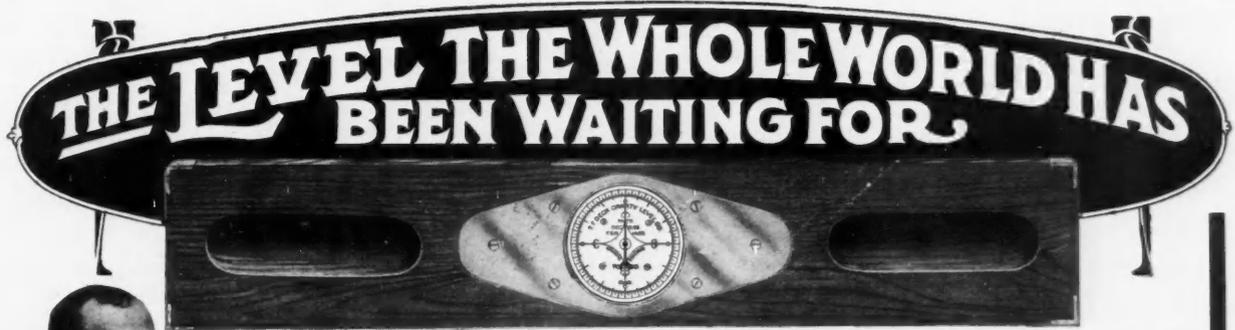
First: A roof fitted with this shingle cannot leak. The interlocking principle is so complete that for water to get through the shingles is against the laws of nature. Water cannot run uphill, yet that's the only way it could enter a roof of "NEVER LEAK" SHINGLES.

Cannot warp, rot, split or absorb water and remain damp. And of course they're fire-proof.

Cost Compared with Wood

Figure what wood shingles have cost you in the last ten years. Consider the repair bills and all around





To every mechanic a perfect level is an essential part of his equipment. He desires one that is simple and durable in construction and perfectly reliable under all conditions.

It is impossible to convey in a few words the many advantages obtained by this remarkable invention over all other levels on the market. You will understand it best, perhaps, when we tell you that the Deck Gravity Level in competition with the most perfect spirit level made proves the latter to be absolutely inaccurate and untrustworthy.

The T. F. Deck Gravity Level is constructed on the plumb-bob principle, which is absolute proof of its accuracy. It is so sensitive that it will detect variations from the level or plumb to so small a degree as the one-hundredth part of an inch to the foot.

Our level is simple in construction, wholly practical, extremely durable, and is not affected by atmospheric changes. It is so arranged as to automatically indicate horizontal and vertical positions, and the angle of any deviation correctly without any adjusting whatsoever.

We have a full line of levels for the carpenter and general mechanic in twenty-four and thirty inch lengths; also mason's plumb and level forty-two inches long. All levels are finely finished and thoroughly tested before leaving the factory.

We have the best level on the market, and do hereby positively guarantee our levels to be as above stated, and to do all we claim for them, or your money refunded.

A free catalog, which will interest every mechanic, will be sent upon request. Address,

THE T. F. DECK GRAVITY LEVEL COMPANY - Toledo, Ohio

QUALITY AND SERVICE

are paramount in the manufacture and sale of



APOLLO BEST BLOOM

Galvanized Sheets

They are the dependable kind when it comes to the testing period—whether in the shop or on the building. They are uniform throughout, even in gauge, bend without breaking, and work well. Merit alone has made Apollo the standard of all galvanized sheets. Important jobbers everywhere sell them. Our Weight Card giving sizes, gauges and weights of galvanized sheets is free for the asking.

American Sheet and Tin Plate Company

FRICK BUILDING

PITTSBURGH, PA.

17, while on the ground, or even at the shop, the carpenter can plan where he wants his hinges, drive in the hinge pins so as to make right or left, as desired, and place the pin carrying section on the sash. The gauge shows just where the edge of the wood ought to come. The points are pressed in with the thumb, the hammer drives them home, and the setting of one screw finishes the job.

When up on his ladder, he simply sets the screen in the window, slips the hook under the pin, and one blow of the hammer drives the points home. This leaves both hands free to set in the single screw. All done and no chance for a blunder. With a little care in measuring, screens may be put up from the inside, doing away with the use of ladder and helpers.

The angle of the hook is so calculated that in the hanger position a 6-foot sash can be lifted off when the bottom is pushed out 24 inches or more, others in proportion.

It is the only hanger on the market which can be used either as a hanger or a hinge, and which will hang either a full size or half screen in either position.

The accompanying cuts shows the manner of applying the hinges.

Make Estimating a Pleasure

As shown by the cut, the Perry lumber reckoner is a collection of tables showing the number of feet, board measure,

in any number of pieces up to one hundred, of a given size. The book is so indexed that you can turn to any size instantly and be sure that you are right.

It is a pleasure to figure long lumber bills with this book, for they can be figured in one-half the time required by the old method. Lumber dealers, with this book, can truthfully say, "Estimates cheerfully furnished."

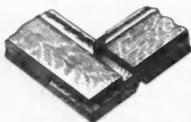
Contractors and carpenters can avoid those costly mistakes which are made so frequently in the rush of business. With this book, the office boy can check the bills as well as his employer.

No contractor nor builder can afford to be without this labor-saving book. Write for it today, addressing Benjamin L. Jenks, 308 Euclid avenue, Cleveland, Ohio.

The Joke Was on Casey

"Curse ye for being a nuisance, anyway."

The sentence was uttered with such vehemence that I turned instinctively to see who was being cursed, but the only person in sight was Casey, the local roofer, who, however, was in the act of throwing a hammer with all his might at



"See that Corner"

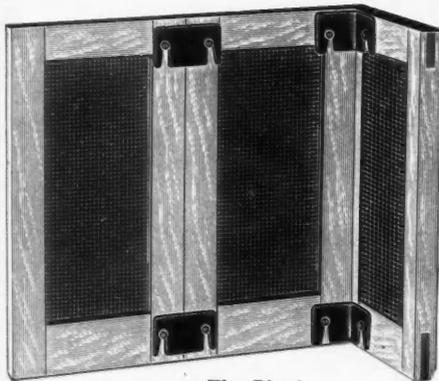
Notice that rails lap over stiles, which prevents the splitting of plowed edges, so common with most screens but not with ours. They cost no more than the inferior.

FLY SCREENS and SCREEN DOORS

Made to order neatly and promptly. From a single screen or door to a thousand. Wire fastened by the most improved Standard Shoulder Strip Method.

Mr. Carpenter, Builder or Contractor, write for free copy of our 1909 illustrated catalog.

STANDARD SCREEN CO., 803-05 W. 14th St., Chicago, Ill.



The Big 4

Diehl's Screen Door Hinge No. 17
STRICTLY MALLEABLE IRON

Door can be taken off without removing the hinge. No other hinges made like Diehl's. Ask your dealer for them.

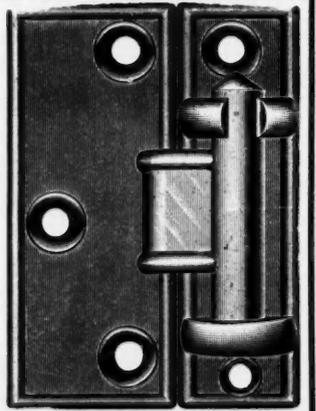
The Big 4 Corner Brace and Coupling

for putting up Storm Houses, Porch Screens, Portable Screen Cottages, and fastening Box Corners used by all Practical Builders. Ask for the Big 4.

Samples sent upon receipt of 10 cents in stamps to pay for packing and postage of same

Manufactured by

DIEHL NOVELTY CO.
SHEBOYGAN WISCONSIN



This Looks Good to Others, How Does It Look to You? \$110 to Be Given Away in Prizes.

We want you to know us, and to know our goods, and their superior qualities and conveniences over all others. We take the lead in a practical line of builders' hardware. To satisfy yourself of this fact send 10 cents in stamps for sample of any article that we manufacture. Seeing is believing. Send for catalogue and satisfy yourself.

In order to introduce our goods to the contractors, we are offering the following prizes to contractors that use the largest amount of our goods between April 1st, 1909, and December 1st, 1909.

- 1st Prize.—Gentleman's Gold Watch, 16 size, 17 jewel, hunting case, Howard movement, value \$35.00.
- 2nd Prize.—Gentleman's Gold Watch, 16 size, 17 jewel, hunting case, Hamilton movement, value \$25.00.
- 3rd Prize.—Gentleman's Gold Watch, 16 size, 15 jewel, open face, Elgin movement, value \$15.00.
- 4th Prize.—Gentleman's Solid Gold Watch Chain, value \$12.00.
- 5th Prize.—Gentleman's Solid Gold Fob, value \$10.00.
- 6th Prize.—Gentleman's Solid Gold Locket, diamond set, value \$8.00.
- 7th Prize.—Gentleman's Solid Gold Locket, value \$5.00.

DIEHL NOVELTY CO.

Diehl Novelty Co., Sheboygan, Wis.

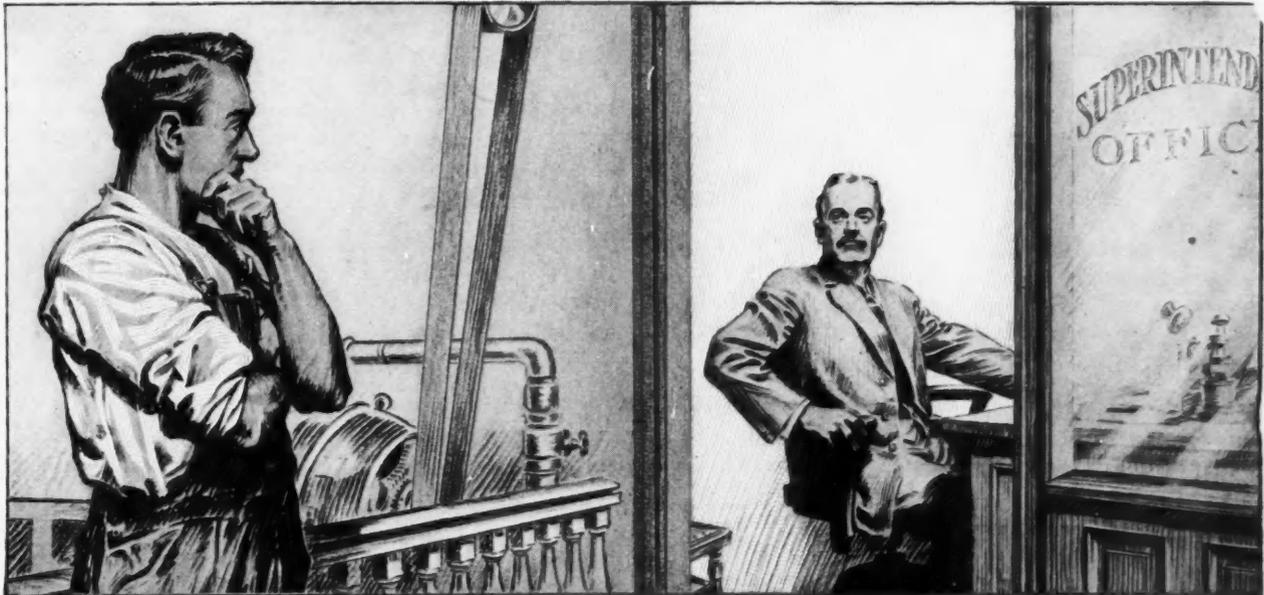
Name of Contractor..... Address.....
Name of Dealer from whom goods were purchased..... Address.....

Fill in with amount of goods used:

.... Doz. No. 1 Hangers and Fasteners.	.... Doz. No. 2 Screen Hooks.	.... Doz. No. 19 Basement Window Catch.
.... " " 1 Hangers only.	.... " " 17 Screen Door Hinge.	.... " " 45 Inside Turn Button.
.... " " 1 Fasteners only.	.... " " 18 Screen Door Hinge, extra part.	.... " " 55 Corner Brace.
.... " " 1 Screen Hooks.	.... " " 21 Basement Window Hinge.	.... " " 60 Coupling.
.... " " 2 Hangers and Fasteners.	.... " " 22 Basement Window Hinge.	.... " " 28 Base Knob.
.... " " 2 Hangers only.	.... " " 9 1/2 Basement Window Hinge.	.... " " 50 Screen Door Catch.

You can show any of these prizes to your local jeweler and if he does not verify our statement of value you may leave them with your local express company or banker and we will forward for the amount.

All carpenters and contractors wishing to enter the contest please fill out this coupon and mail it to us at the end of each month so that we may be able to award prizes to the right parties at the end of the contest.



Mere Wishing Won't Bring Success

You wish to be successful. You wish for promotion, a higher salary, and a prosperous future.

But what are you doing to make these dreams come true? Are you one of the vast army of "wishers" who think they can secure promotion by trusting to luck, waiting for things to turn up, and thinking that promotion must come if they wait long enough? If you are, wake up! These are exploded fallacies today because of the immense multitude of men looking for jobs—men who are not trained to do any one thing particularly well, who can do "most anything" as long as it is a job—and because employers must have men who have technical training in addition to practical experience to fill the more responsible positions.

If you want to secure promotion, the most sensible way to get it is to prepare yourself to competently fill the position you desire. Isn't this reasonable? If you wish to find the most practical, simplest, and most efficient way in the world to better your position and salary, here is one way at least that you ought to investigate. You ought to investigate it because it has enabled hundreds of thousands of other men in all conditions and circumstances of life to materially better their positions and secure success; because the institution—the I. C. S.—goes to you in your home, in your spare time, without obliging you to buy books, and gives you the assistance of the most powerful salary-raising force in the world. No matter what your circumstances, the I. C. S. adapts its training to your individual needs and pocketbook.

Mere wishing won't bring you success, but a systematic training for the position and occupation of your choice will. If you really want promotion, a higher salary, and a happier and more successful life, make a definite attempt to get it. Investigate the most practical promotion-gaining plan in the world by marking and mailing the coupon below. **MARK IT NOW.**

International Correspondence Schools Box 910, SCRANTON, PA.

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

Architect	Estimating Clerk	Foreman Machinist
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Struct'l Draftsman	Mechan'l Drafts'n	Stenographer
Plum. & Heat. Con.	Stationary Eng.	Ad Writer
Supt. of Plumbing	Electrical Engineer	Window Trimmer
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Plumbing Inspect'r	Elec.-Light Supt.	Civ. Service Exams.
Heat. & Vent. Eng.	Elec.-Rail'y Supt.	Chemist

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City _____ State _____

some object lying at his feet. Evidently Casey was angry—very angry.

"Hello, Casey," I said, "what's the trouble?"

"Hello yerself, Mr. Jones," he replied sheepishly, evidently ashamed that I had witnessed his outburst of temper, "and is it trouble ye be callin' them? Well, I call them a d—d nuisance."

"Call what?" I asked.

"Call this," and he held up what at first glance appeared to be a Cortright metal shingle.

I walked toward him and soon saw that it was a very fair imitation of the genuine article, but wishing to find out how far he was familiar with them, I asked him what it was supposed to be.

"Be!" he snapped, "why, have ye lived all this time an' don't know it's one of them Cortright shingles that all the town is going crazy about?"

"Why, man, the new school and the Presbyterian church an' half the residences are being covered with them, and devil a wan of the jobs did I git because I didn't know nothing about them at all, at all, so I says to myself, says I, 'Casey, if it's as aisy to lay thim as that feller says it be, ye're a dunkhead if ye don't make some money wid thim, an' the old buildin' here was needin' a new roof.' So after thinkin' over the matter, I says to the wife who was just starting down town, 'Here be the measurements, stop in at Smith's and have him send round enough shingles for a new roof for the ould buildin'.'

"They came,—I set to work to onct and I lays two rows in six hours. They won't fit and they aint cut straight and—"

"But, Casey," I said, "they're not Cortright shingles—every genuine Cortright metal shingle has 'Cortright Reg. U. S. Pat. Off.' stamped on the fourth ridge."

"G'wan, stop yer kiddin'," he said, "I know nothin' about

yer stamin, but I do know when I git hold of somethin' that looks exactly like the picture in the book, an' that's a Cortright shingle, Mr. Jones."

I started in to explain, but fortunately Mrs. Casey appeared on the scene and with a triumphant grin Pat turned to her, asking, "Aint these Cortright shingles, Bridget?"

"Well, no, not exactly. Mr. Smith didn't have the Cortright kind, but these are just as good and a little cheaper. He told me so himself."

One look at Pat's face convinced me that *there was going to be a row at Casey's*, so I bade him a hasty good-bye, as it has always been one of my principles never to interfere in family quarrels.

Moral: To avoid trouble of every kind, see that the shingles you buy have the stamp, "CORTRIGHT REG. U. S. PAT. OFF."

Canton Art Metal Goods

Metal ceilings are no longer an experiment, but are now recognized as a commodity of more than ordinary importance. Their value is not only in the capacity of the covering for the ceiling and side wall, but the beautiful designs embossed in the plates add to their beauty and admit of a high degree of ornamentation.

With the advent of the twentieth century, use of steel ceilings has become very extensive, and especially in the larger and more costly buildings; and in some localities, it is quite popular for residences. And why not? The wearing qualities considered, is not metal cheaper than the many other kinds of wall covering today? The first cost may be a trifle more than good hard plaster, but with metal, there is no danger of falling or need of repairing, the advantage will be readily understood, as the first outlay is practically the only expense. It is true that metal ceilings need painting now

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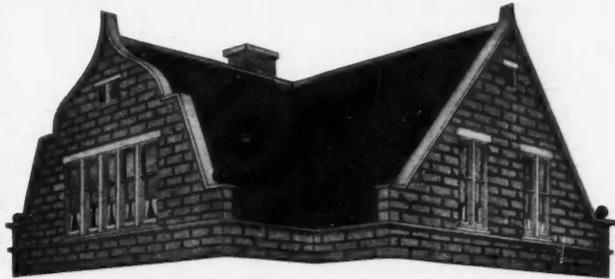
Special Slim Taper Files

Slimmer than any other files on the market. Get right down to the bottom of the tooth in the finest saw.

Quality, temper, shape, finish, cutting are perfect.

If not at your dealer's, write us for free sample.

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Write Us for Prices for Anything in the Slate Line, Before Buying Elsewhere. We Furnish Best Goods at Lowest Prices.

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MEXICAN THEATRE JUAREZ, Guanajuato, Mexico.
Rivas & Malo, Architects, Mexico City, Mexico.

Fame in Foreign Climes

All the statuary used on this beautiful Mexican Theatre was made by us. It is the pride of Guanajuato and attracts the attention and admiration of all visitors.

Mullins

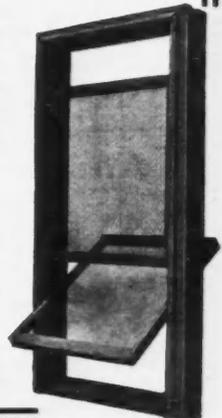
Sheet Metal Statuary and Art Architectural Work

has genuine artistic merit and has received the endorsement of many eminent sculptors. It is as durable and artistic as cast bronze or sculptured work and costs less. Our wide experience and universal reputation for doing the best and most artistic sheet metal work of every description enables us to undertake commissions which others would have to refuse.

Architects and contractors seeking information about ornamental Cornices, Panels, Friezes, etc., should write for our 120-page catalog. We also issue a separate statuary catalog which will be sent if you ask for it.

Please specify what particular kind of Metal Work or Statuary you are interested in.

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AN EDWARDS METAL SPANISH TILE ROOF

COSTS NO MORE THAN A GOOD TIN ROOF

Artistic and Ornamental in appearance and is positively guaranteed to be Fire, Lightning, Rain, Storm and Wind proof.

Its extreme lightness (about one-eighth that of slate), durability and moderate cost commend it to those wishing something out of the ordinary in roofing.

Manufactured from best quality Worcester Grade Terne Plate, furnished painted or galvanized (galvanized after being formed) size 10 x 14 inches.

Descriptive Booklet sent free on request.

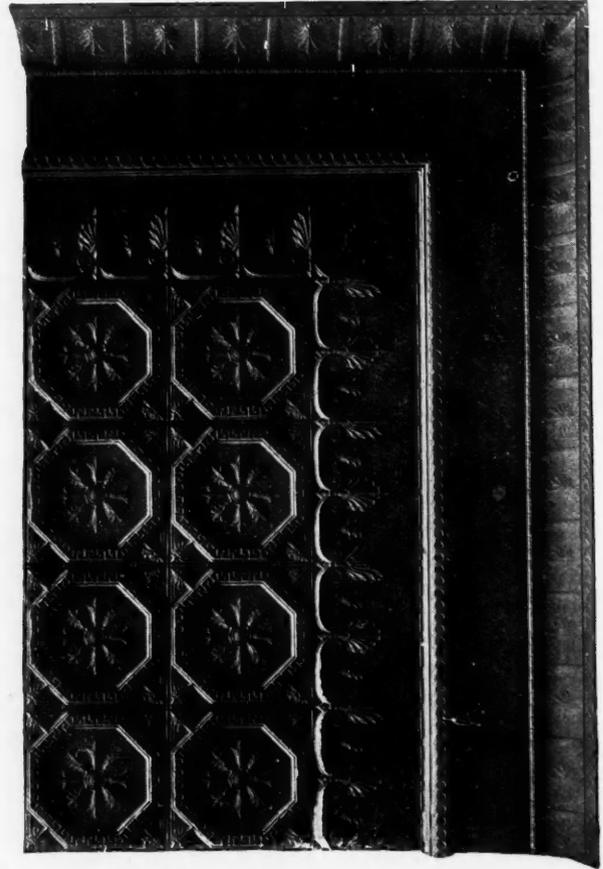
The Edwards Manufacturing Co.

"THE SHEET METAL FOLKS"

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and then, but do not other styles need refinishing to keep them neat and clean?

Although not fireproof in the strict sense of the word, they are fire retarding, and have been known to confine a fire to the first floor of the building, where it was easily overcome, preventing what might have been a conflagration.



Although a common belief, it is a false idea that all metal ceilings are alike or have the same qualities. There are good ones and bad ones. Chief among the good ones are Canton metal ceilings, which stand for quality. In them, special attention has been given to the construction, an all-important feature, without which there is endless trouble and loss of time in erection, and a badly appearing job as the result.

An exclusive feature is the die punched nail holes and repressed beads, made on dies which are accurate to the one-thousandth part of an inch, and these are found only in these products. The advantage is that it saves labor in the erection, gives better alignment and tight joints, making a much nicer appearing and more serviceable job, and assures satisfaction to the purchaser.

The beads are perfect, allowing no open joints. The alignment is true and regular, and the plates will fit on any of the four sides. There are no rough edges, all sides being trimmed close to the beads. Different parts of this ceiling which go to make up the design are interchangeable.

The construction is so simple that it does not require an experienced mechanic to erect them successfully.

The architectural features are not to be overlooked. By referring to the illustrated catalogue, it will be noted that the designs are classified, each having a full complement of parts necessary for a complete design. From the many designs, suitable patterns may be selected for any style of building. The Gothic and Romanesque are popular for churches, the Rococo and Renaissance for public halls, and the Colonial and Empire for court and municipal buildings; the Rococo

THE LOWE BROTHERS COMPANY

began by making

Low Brothers High Standard Liquid Paint

better than any other made at that time—more than thirty years ago—so good that the "wise" manufacturers said there would be no market for it. The Lowe Brothers Company has kept on making "High Standard" Paint good; better than "hand-mixed," "strictly pure" paint or any others that have been modeled after it.

People in time found out that "High Standard" was better. It takes years to prove that the paint on a house is better, for the real test is one of wear. Protection is, after all, what the people want, as well as prosperous appearance; "High Standard" wear shows it, and the

"LITTLE BLUE FLAG" Is the Sign of Protection.

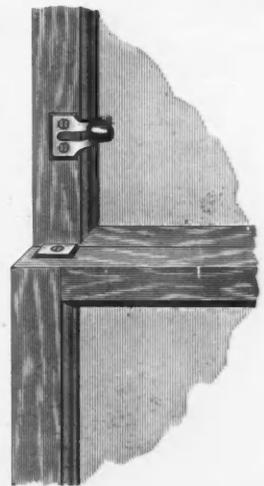
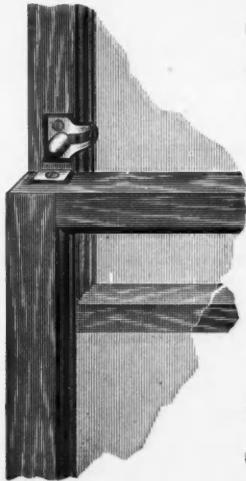
So more people have been buying "High Standard" Paint each year, and when they have had need to repaint, they have bought "High Standard" again.

That is the best evidence of satisfaction, and there is abundant evidence regarding "High Standard"

And there is a Paint or Varnish for every need—outside or inside—and a way to make the entire house and grounds harmonious—having the beautiful effect of home—and they are all the best of their kind. *Sample combinations and booklets on request.*

Consult Sweet's Index (1907-8) pages 1378 and 1379 and (1908-9) pages 1282 and 1283.

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IVES PATENT VENTILATING LOCK

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

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A complete Safety Razor, with a money-back guarantee FOR 25

CENTS—an absolutely virgin field of customers to draw from—A CONTINUOUS SALE OF BLADES—a magnet that pulls a mass of new buyers into your store for shaving-soap, strops and all shaving accessories—and a clear profit of 50 per cent on every single one of the hundreds of razor sales—that's exactly what you're losing every day you delay in putting in a stock of Shrp-Shavr Razors.

We're spending thousands of dollars to create customers for you. Co-operate with us. Do your share and get your share. We're working tooth and nail for you in the magazines. Won't you take your part of the profits that are waiting for you?

Write your jobber, or if he will not supply you, order direct, and get your share of the Shrp-Shavr business.

PRICES

SHRP-SHAVR RAZOR with one blade, per dozen - - - \$2.00
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If you are interested in Roofs—the best and most economical Roofing to use, for all kinds of buildings—let us send you samples of "Rubber Sanded," and our 32-page booklet. Write today—before you forget it.

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Model "Ranger" bicycle furnished by us. Our agents everywhere are making money and district to ride and exhibit a 1909 fast. Write for full particulars and special offer at once.

NO MONEY REQUIRED until you receive and approve of your bicycle. We ship to anyone, anywhere in the U. S. without a cent deposit in advance, *prepay freight*, and allow **TEN DAYS' FREE TRIAL** during which time you may ride the bicycle and put it to any test you wish. If you are then not perfectly satisfied or do not wish to keep the bicycle you may ship it back to us at our expense and *you will not be out one cent.*

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YOU WILL BE ASTONISHED when you receive our beautiful catalogue and study our superb models at the *wonderfully low prices* we can make for 1909. We sell the highest grade bicycles for less money than any other factory. We are satisfied with \$1.00 profit above factory cost. **BICYCLE DEALERS**, you can sell our bicycles under your own name plate at double our prices. Orders filled the day received.

SECOND HAND BICYCLES. We do not regularly handle second hand bicycles, but usually have a number on hand taken in trade by our Chicago retail stores. These we clear out promptly at prices ranging from \$3 to \$8 or \$10. Descriptive bargain lists mailed free.

TIRES, COASTER-BRAKES, single wheels, imported roller chains and pedals. parts, repairs and equipment of all kinds at *half the usual retail prices.*

DO NOT WAIT, but write today and we will send you **free** by return mail our large catalogue, beautifully illustrated and containing a great fund of interesting matter and useful information; also a *wonderful proposition* on the first sample bicycle going to your town. It only costs a postal to get everything. **Write it now.**

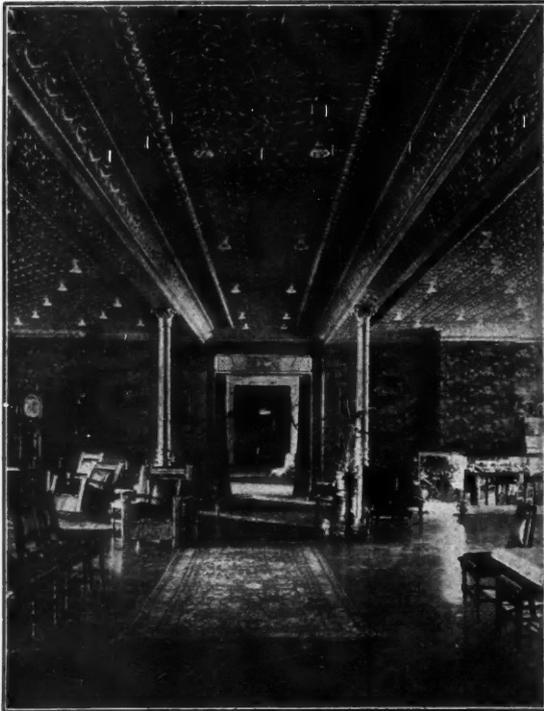
MEAD CYCLE COMPANY

Dept. T. 122

CHICAGO, ILL.

and Greek for restaurants and the Colonial for private dining rooms.

The embossing in the plates is deep, and the figure is clean



and bold, a feature which cannot be obtained where from four to six plates are stamped at one operation.

Another special feature, in the side wall and wainscot

finish, is the imitation of wood. This is made in the paneled pattern, and can be finished in light or dark oak, mahogany, walnut, cherry or any other effect in the natural colors.

The beautiful Art Metal Book of designs, containing 104 pages, will be especially interesting to those considering the agency for metal ceilings in their locality. This book was issued at large expense, but a copy will be sent to you free upon request on your business stationery.

This company furnish plans and prices upon receipt of diagram showing the size of room to be ceiled. They now have in process of construction their own rolling mill, which they expect to have in operation in a short time. This will permit them to increase their capacity and furnish goods at less cost without affecting the quality.

Of other embossed sheet metal goods, they invite your attention to their many styles of imitation siding, in plain pressed and rock faced brick and stone. These are made in different sizes and figures with corner finishes, belt courses, etc.

They design and complete building fronts of sheet metal, including cornices, pediments, columns, window and door cases, caps and sills. These fronts are durable and ornamental, although inexpensive. Their book of designs will be sent free on request.

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Mr. H. F. Johnson, of S. C. Johnson & Son, the wood finishing authorities of Racine, Wis., said in a recent interview:

"I want to place in the hands of every painter in America, at once, entirely at our expense, a sample bottle of Johnson's wood dye, one of Johnson's Electric Solvo for removing old finish, one sample package of Johnson's prepared wax, a set of panels showing Johnson's wood dye on different woods—hard and soft—and a copy of our 48-page reference book,



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"The Roof that Outlives the Building"

House-owners make a step-child of the roof because they have been driven to believe that no roof can be worth the money it costs. It's hard for a client to swallow a big roofing bill when he sees following it a long string of nagging little bills for painting and repairs.

Every client with an open mind appreciates Asbestos "Century" Shingles—their indestructibility means genuine protection against weather and fire. Their beauty makes the house attractive and adds to its market value. Their first cost is little if any higher than many less desirable roofings—and they bring no cost of up-keep.

Three colors, numerous shapes and several sizes.

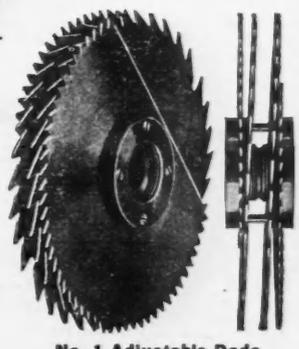
Ask your Roofer for new quotations. Send for Booklet "Roofing 1908."

The Keasbey & Mattison Company, Factors
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FOX MACHINE COMPANY

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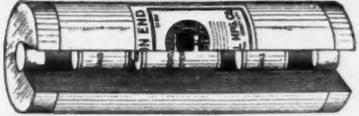
No. 3 Mitring Machine

Cuts a double miter on small mouldings **In One Stroke** and in two or more strokes on larger mouldings.

Adjustable Saw Dado

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Just as ready roofing has demonstrated its superiority over shingle, slate and tin roofs, so has **MONARCH** Asphalt Roofing conclusively proven its superiority over the usual ready roofing.

Genuine asphalt is acknowledged to be the most satisfactory roofing saturation and coating so far known. We use genuine Pitch Lake Trinidad Asphalt and all wool felt in the manufacture of **MONARCH**, and our method of applying the asphalt saturation, coating and mineral surfacing makes **MONARCH** a solid and perfectly combined whole—impervious to water and proof against flying fire-brands.

Know what you are buying—there is no substitute for genuine asphalt roofing. Send for Sample Set M-2.

Carpenters and Builders.—We know Monarch will justify our claims. You cannot find a better Roofing at any price. We earnestly desire you to give it a trial. If your dealer does not carry Monarch we will see that you are supplied direct.

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Central Mantels

are distinctive in character, workmanship and finish. Twenty years' experience catering to the wants of the home builders enables us to know and meet their wants.

Our factory being equipped with all of the most modern labor-saving devices and keeping on hand constantly an enormous stock of raw materials, places us in a position to sell **better mantels cheaper** than it is possible for you to buy elsewhere.

We can furnish any style from Colonial to Mission, and in any wood or finish, at prices ranging from \$10.00 up.

The above is one of the many designs shown in our 112 page catalog, which is the finest and most complete mantel catalog ever issued. Catalog sent free on request to Carpenters, Builders or anyone building a home.

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Good Material and Plenty of It

Many ready roofings are made of flimsy, light-weight paper, scantily coated, which last only a year or two.
Granite Roofing does not belong in that class. Good materials and plenty of them are used in making it. There is nothing flimsy or fragile about Granite Roofing. It has a heavy sea-grit surface, which takes the place of the usual coat of paint, and wears indefinitely. Other roofings require coating with some special compound every year or two, but Granite Roofing never requires any coating. After the roof is laid, it will take care of itself.

A Free Sample will be sent "for the asking." You will be astonished to see how heavy, firm and durable a ready roofing can be made.

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PER MONTH IN THE
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I will teach you the Real Estate Business by mail and appoint you my special representative. I handle Real Estate on the co-operative plan, the only profitable way, and need you, no matter where you are located or what business you are in. Ten dollars (\$10) will start you. I will help you make money. You should make \$200 to \$500 per month. Write for my free book, "The Real Estate Business and Its Present Day Opportunities. It is a guide to the Real Estate Business and it is free. Address

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Expert on Reinforced Concrete
Reservoirs, Stand Pipes, Bridges, Etc.

"The Proper Treatment for Floors, Woodwork and Furniture." I do this gladly and will prepay every cent of charges."

Mr. Johnson said: "We have found this method a most successful advertising plan, and have distributed in the past year many thousands of these samples.

"We have found that in almost every case where these samples were asked for by a progressive painter, we have had good results in the way of later business.

"That is because Johnson's wood dye is a product that proves for itself.

"When a thinking painter secures these samples and puts them to the actual test, he is found to be convinced of their superior working quality.



"He is bound to realize that their use means greater satisfaction to his customers, greater reputation and more money to him.

"The strongest point about Johnson's wood dye is that it is a dye—not a mere stain—not a coating that covers the wood and hides its beauty.

"It penetrates the pores and, in a peculiar way, becomes part of the wood itself.

"It protects it, so that if the finish is scratched or marred, the natural color of the wood is not disclosed.

"It does not raise the grain.

"It will not lap or streak. And it is easy for the painter to get the exact effect he plans because Johnson's wood dye is sold in fifteen standard shades.

"Johnson's prepared wax, in paste form, is well known by painters and decorators as a finish for floors, but I want to emphasize that it gives equally good effects on furniture and woodwork.

"We are the only concern making a black wax for use over dark woods.

"We recommend Johnson's prepared wax black for use over every shade of Johnson's wood dye.

"It covers five times more space than ordinary wax. It is superior to any other, because it contains 20 per cent more of the hard, expensive polishing wax.

"Our 48-page book, 'The Proper Treatment of Floors, Woodwork and Furniture,' is printed in six colors, contains 80 illustrations, 44 of them in colors; is full of good, hard, practical sense founded on 27 years of experience with woods and finishes."

Mr. Johnson's offer is certainly a liberal one and we are sure that many of our readers will want to take full advantage of it.

The S. C. Johnson & Son's advertisement, which appears on another page, lists the fifteen standard shades of Johnson's wood dye and contains the coupon to be used in sending for the free samples. Look up the advertisement.

Removable Steel Clothes Posts

Quite a novel little departure from old-time methods are removable steel clothes and fence posts, manufactured by the

No. 1



Fire Proof

STANDARD—Lock Joint—METAL SHINGLES
Ornamental, Easily Applied Guaranteed Weather Proof

CANTON MANUFACTURING CO.

We can save you money on
Cornice, Skylights, Ventilators, Metal Ceilings, Roofings, Sidings, Eave Trough, Conductor Pipe

1320 E. 2d Street CANTON OHIO

No. 2

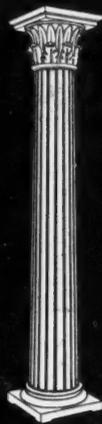


ABSOLUTELY STORM PROOF

Catalogue FREE

No. 3





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For Porches and Pergolas

Dignified classical designs. Made entirely of metal in all sizes up to 40 inches in diameter. Finish to match any wood perfectly. Will not split, check or rot. Stronger and more durable than wood. Last longer—cost no more. Write now for Booklet O-4, describing **UNION METAL COLUMNS** (Patented) **UNION METAL MANUFACTURING CO.** 4015 Clifton St., CANTON, O. We Ship Everywhere.

BUY A BOVEE FURNACE

Direct from the Factory

AND SAVE \$50.00 TO \$100.00 ON YOUR HEATING PLANT

They Actually Save from One-Third to One-Half of the Fuel

We have one of the best equipped furnace factories in the west and make more than 30 different furnaces of seven leading styles and can furnish our customers with practically any size or style of furnace they may desire, either **Upright or Horizontal**, sufficient to heat a large church or school house, down to a cottage heating plant complete with all pipe, registers and fittings for **\$55.00**. Our furnaces are the only furnaces having a **perfect ventilating system** for every part of the house. We ship our furnaces cut to fit. Any handy man can install them without the aid of a tinner.

Catalogue and full specifications free.

BOVEE GRINDER & FURNACE WORKS
50, 8th Street WATERLOO, IOWA

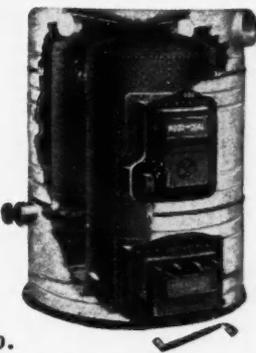


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THE steel, and the teeth formed from the steel are vital things about a Hand Saw. All the cutting of a saw is done at the points of the teeth, therefore a saw should be made of material that will hold the tooth points, or, in other words, hold its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

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Milwaukee Steel Post Company, of Milwaukee, Wis. These posts are made of tube steel, filled with concrete, and their advantages over the old style are numerous. In the first place, they are cheaper than wooden posts, they are indestructible, and easily removed. They do not obstruct the lawn in any way and they are guaranteed to last over 25 years, whereas a wooden post lasts only a few years at the outside. These posts can be removed instantly by a woman or child, leaving the lawn free for mower or other purposes. These posts are held in position by a patented contrivance, just driven into the ground flush with the turf, as per cut shown.



Fence posts for farm or garden are made in precisely the same way, and make indestructible fences at a fraction of the cost of other methods. Their catalogue is free on application. It tells you all about them. Address the Milwaukee Steel Post Company, Milwaukee, Wis.

Expansion Bolt in Modern Construction

While many, who have taken time to look into them, are now more or less familiar with the wonderful time and labor saving qualities of a modern expansion bolt, there are easily as many more who are still unfamiliar with them, so in keeping with the aim of this paper to present to its readers all devices of proven merit and probable interest, the following is submitted:

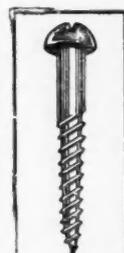


Fig. 1.



Fig. 2.



Fig. 3.

Expansion bolts, in their many styles and sizes, are used wherever there are "things to fasten" to brick, stone, marble, concrete, tile or slate. They are made in every conceivable size—from 1/8 to 2 inch diameters for use variously with wood screws, machine screws, lag screws and machine bolts. The cut here shown will illustrate the Standard Star anchor. Your attention is invited to the simple working principle and quick, easy application involved.

The Star screw anchor (Fig. 2) is made in one piece of lead composition metal to fit any ordinary wood screw from a No. 5 to a No. 24. To use: Drill hole. Insert expansion shield (Fig. 2). Put screw (Fig. 1) through material to be fastened into inserted expansion shield (Fig. 2), then fasten tight, and the positive inner-end expansion shown by Fig. 3 occurs, and one has a fastening which will hold indefinitely. The inner-end expansion insures against chipping or defacing the outside surface matter. The fastening is more ornamental than otherwise.

Identically the same simple principle of expansion characterizes the Standard Star two-piece lag screw type which

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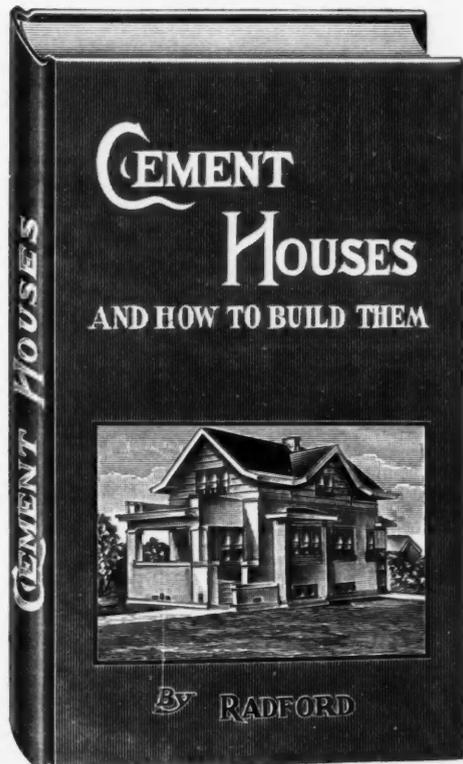
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Chimneys, Porches, Tanks and Cisterns,
Expanded Metal Meshing, Metal Lath,
Establishing a Concrete Block Business,
Cement Plaster and Stucco Work,
Concrete on the Farm, Cement Brick,
How to Overcome Concrete Troubles,
Causes of Cement Failures, Freezing,
How to Select Proper Aggregates,
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261 Broadway,
NEW YORK, N. Y.

has lately found such cordial government approval. This latter style is designed for use with all coach or lag screws from 5/32 to 1/2 inch diameters, any desired lengths, and may be had in all sizes in malleable iron—in the smaller sizes (up to 1/2-inch) in lead composition metal. Both the foregoing types are very largely specified on United States Government contract work, and are recognized as standard.

Then one should know about machine expansion bolts which work on a somewhat different principle, and which for some special purposes are preferred to the other and more popular styles above described. Machine expansion bolts are of two kinds—single wedge and double wedge. Either will fit any Standard machine bolt or screw from 3/16 to 2 inch diameters any length. The single wedge produces an inside lateral expansion rather similar in effect to the styles above shown, but operating on the principle of an engaging wedge-shaped

nut which picks up thread of bolt and is thus drawn outward toward surface matter, operating as it does to spread inner sides of shield against sides of hole.

The double wedge also has the same inside engaging wedge-shaped nut, but in addition there is a similar wedge-shaped unthreaded collar on the outer end of shield over which sides of shield force themselves outward, producing a horizontal expansion.

Both of these two types, together with many other time and labor saving specialties, such as Star toggle bolts for fastenings to tile, terra cotta, hollow brick or metal lathing, Star cable dogs for supporting conduits and cable, and Star drills for brick and stone, are more clearly described in the catalogue of the Star Expansion Bolt Company, of Bayonne, N. J. This is decidedly worth writing for and we recommend all of our readers to provide themselves with a copy.

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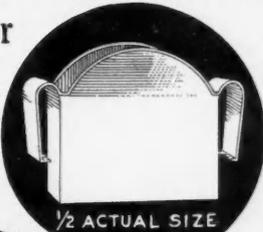
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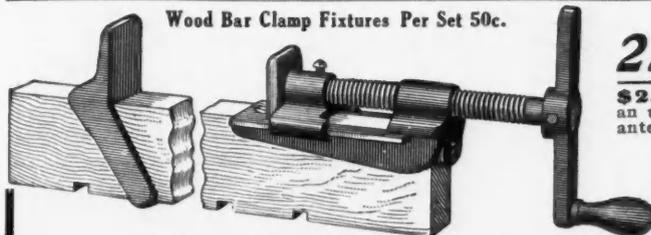


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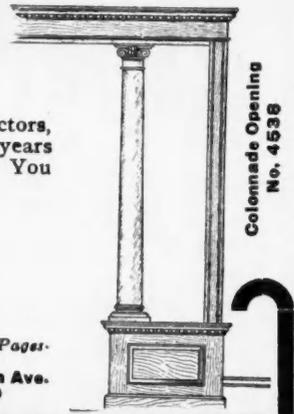
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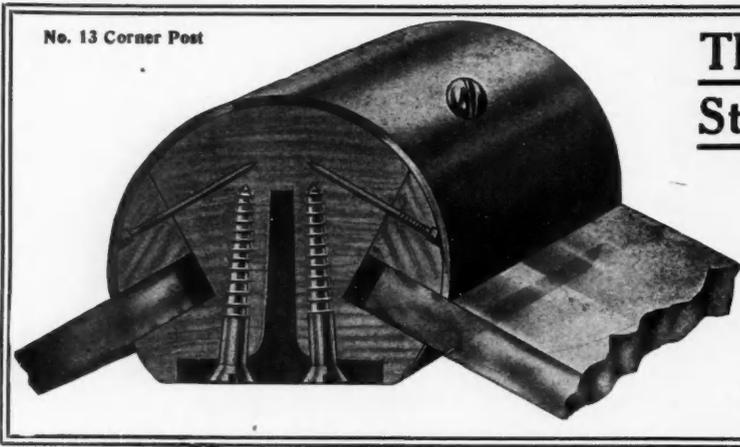
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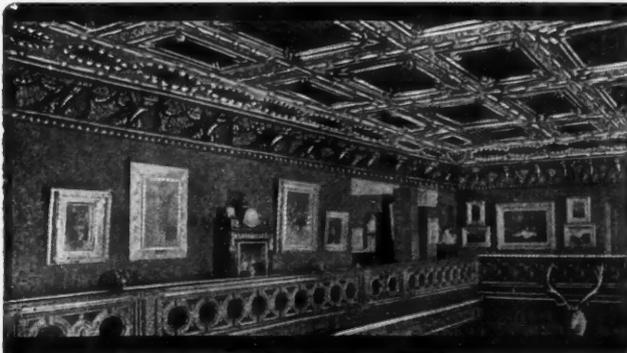
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one man can turn out over

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The Sensation of ALL the Shows

THIS machine is a marvel of simplicity and durability. It has been brought to the highest standard of labor-saving and profit-sharing efficiency, and stands alone and in a class by itself.

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The Peerless is in general use throughout the United States, and its friends are numbered by the thousand.

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Our catalogue tells you all about it. Write for one to-day.

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**Anchor Machines Make
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The wall that's
guaranteed
frost and mois-
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A perfect dead air space from cellar to garret.
Standard Machine makes blocks 8x24 in.—any width from 8 to 12 in.

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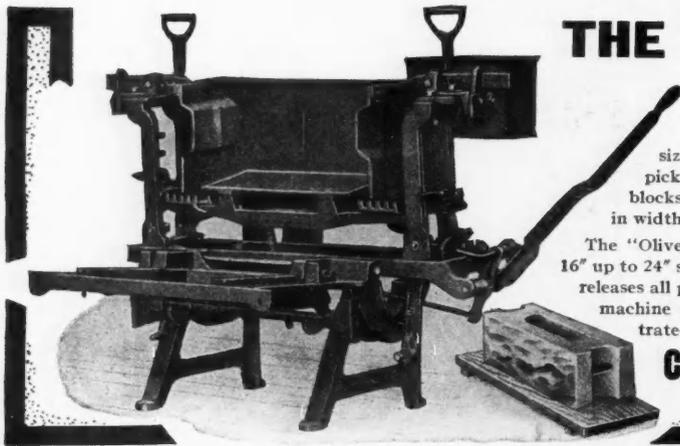
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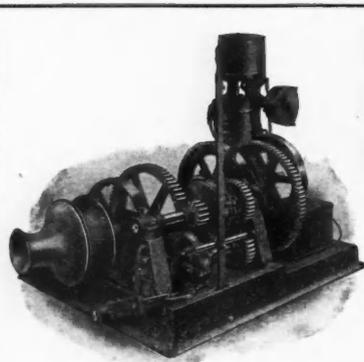


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MAKES GOOD
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Building Material**

The Advance Hoist meets the requirements of the busy contractor—the man who wants to get through—who has work ahead. It elevates loads of from 200 to 2000 pounds, according to the power employed.

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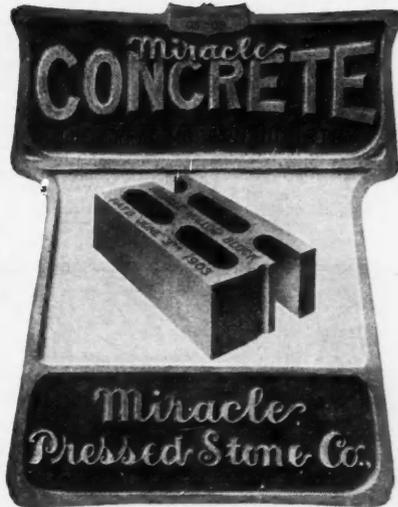


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No chance here for the
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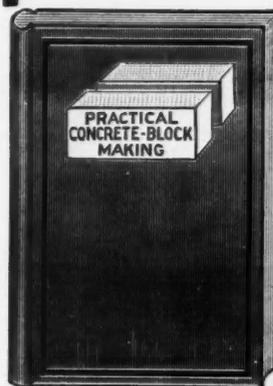
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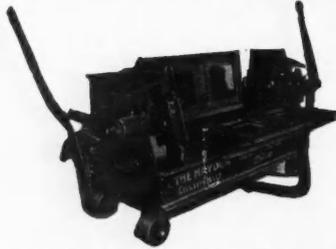
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All blocks made face down; automatic in action, great strength; easy to operate; very rapid; large range, simple in construction



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Two sizes—24-inch and 32-inch

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Block Machines, Power Mixers, Porch
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Tamping Outfits.

Concrete Plants Equipped Throughout

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The Hayden Concrete Mixer
mixes sand, gravel or crushed stone—any proportion.
Maximum capacity 70 yards per day. Water arrangement
perfect. Uniformity and thoroughness absolute.



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Also mounted on trucks with power

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hard, dense and non-
absorbent
blocks. Absolutely no loss
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You can prove these facts for yourself on the machine in your own
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merits. That's probably the way you would like to buy. That's
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Life—nothing to rot out.
Glass Bedded on Spanish
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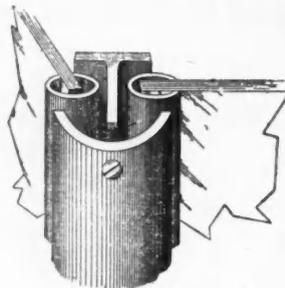
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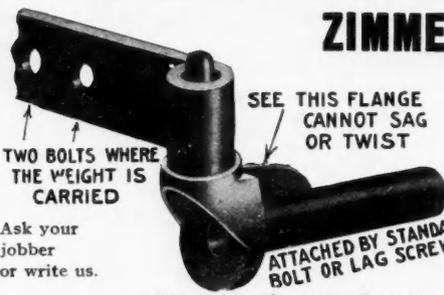
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TWO BOLTS WHERE
THE WEIGHT IS
CARRIED

Ask your
jobber
or write us.

ATTACHED BY STANDARD
BOLT OR LAG SCREW

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SAG
STRAP
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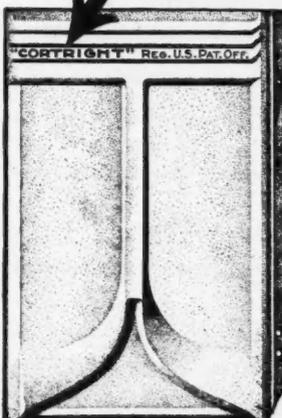
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Because if you do, and you allow some unscrupulous dealer or manufacturer to sell you some worthless imitations, you'll wake up to find that it will take your men longer to lay them than it would

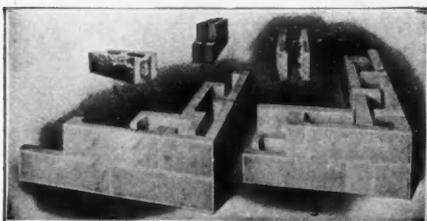
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They won't look so well — and what is most important of all, they won't give satisfaction to your clients.

Cortright Shingles have been on the market 22 years and the first roofs put on are as good as new today and have never needed repairs.

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If you want to join the happy company, write for our 56-page book, "Rightly Roofed Buildings."

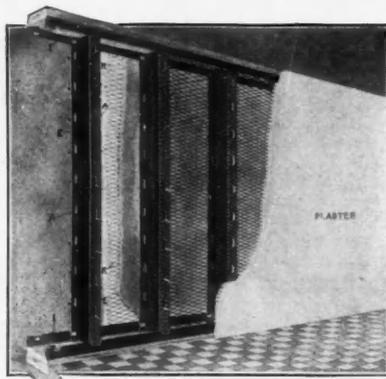


THE FRANCISCO BLOCK MACHINE

builds all of the walls shown in cut, down face, wet process, coarse material, with no extra expense, with the exception of cores for wall No. 3 and No. 4, using the same pallettes for all 5 walls. You also make on our No. 4 machine the 32 inch block, 24, 20, 16 and fractional block, using the same pallettes; also all of your long stone to 5 ft., the 8, 10, 12 inch block for width of wall, with no extra expense for parts or face plates. The machine is adjustable in width to 20 inches, in length to 5 ft., in height to 16 inches. Send for new catalog "G." **AGENTS WANTED.**

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BERGER PRONG LOCK STUDS and FURRING
for use with expanded metal lath.

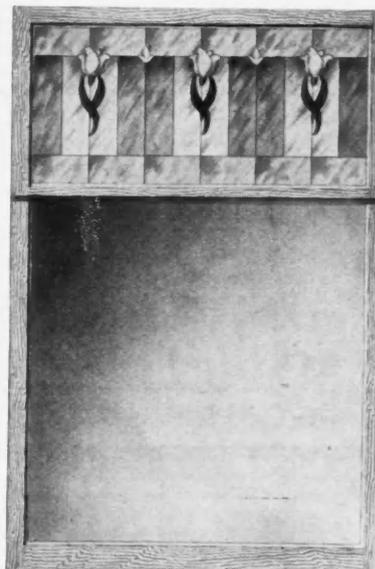
It is a system you ought to be posted about. It is both simple and effective. One man can hang the lath on the prongs and clinch them securely with the tap of a hammer. Berger Prong Locks save time and money. There's no wiring and the lath can't get away.

Write TODAY for catalog F-55-S, which shows how this system is applied to various classes of construction.

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These are full 5-inch face and permit the use of any size lock.

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This Beautiful House was Built by
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It is concrete; strong and warm. It is fire-proof. It is absolutely damp-proof. It costs less than a frame house of the same size and design.

The Jackson System is not a "stucco" method. It uses a solid, durable, poured concrete wall. A dead-air space makes it damp-proof. With it no lumber is wasted for forms.

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"The Miles" Improved Block Machines

Make the Best Block Face down, Adjustable, Rigid, no Springs or Cogs to bother. Wet mix used. Prices right. Ask about our Metal Lined Universal Adjustable Sill, Cap and Step Mold.

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EUREKA MIXER FOR 1909

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30 Tons' Pressure
 GUARANTEES
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THE SOMERS
 uses the "wettest" mix of any block machine on the market.

The Somers Makes Money

We can prove it

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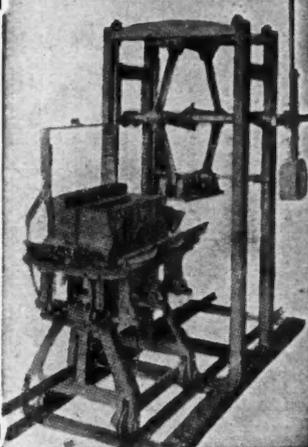
2 Blocks Per Minute
 FASTEST MACHINE MANUFACTURED

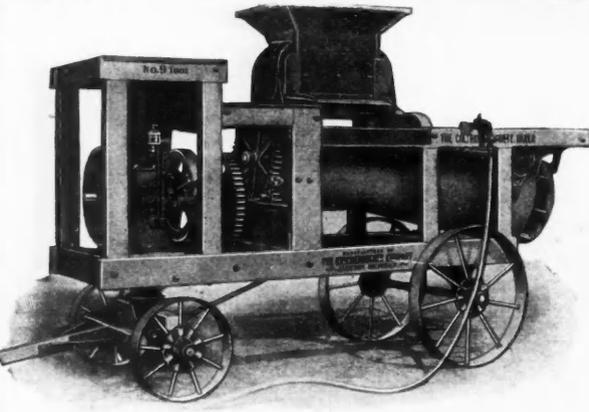
The machine does the work, not the man

It makes an absolutely damp-proof wall

You can guarantee it

SOMERS BROS., Urbana, Ill.





"Labor Cost 28 Per Cent Less"

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 Chicago, Ill., Feb. 18, 1909.

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The Coltrin Concrete Mixers
 Manufactured by
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Concrete Roofing Tile Machinery

Manufacturers in United States

Europa and New Era Concrete Roofing Tile

Handsome, Sanitary, Enduring, Economical

The crowning triumph of mechanical skill and genius

Costs less than any other Roofing Material, presents a much handsomer appearance; outwears all other Roofing.

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Made in practical sizes; all colors; not affected by heat or cold; does not absorb the carbonic acid of the atmosphere; will not radiate heat. Lowers Insurance Rates. *The Manufacturing of Concrete Roofing Tile* is one of the most profitable industries in the country. We Build Roofing Tile Machinery. Information cheerfully furnished. Write for catalogues.

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- Wet Process is Right.
- Face down is Right.
- Three blocks at a time is Right.
- Triple Tiering is Right.
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The Mogul Invincible Block Machine

COMBINES ALL THESE

IT IS RIGHT

It is 48 inches long and will make three 16" or two 24" blocks at one operation. It makes sills, caps, copings, rails and steps, faster and better than a special sill machine. It has every adjustment that any other machine has and many that no other machine has.

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634 No. 6th St., TERRE HAUTE, IND.

The Best Cement Building Block Machine Still Further Improved.

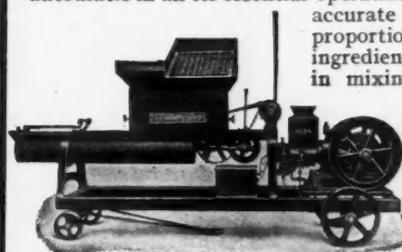
THE U. S. STANDARD

waits not until crowded by competition, but rather leads all competitors, by anticipating in advance the demands of the rapidly developing cement building block industry. The New U. S. Standard with its new equipment is a marvel. Write for our literature.



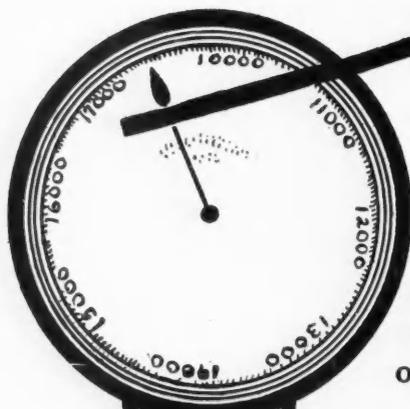
The U.S. Standard Concrete Mixer

automatic in all its essential operations, is pre-eminently accurate in measuring and proportioning the different ingredients, very thorough in mixing, simple in construction, handy for the medium size operator, medium in price, etc. Now we have them all on the run. Write for our literature.



THE ASHLAND STEEL RANGE & MANUFACTURING CO.

ASHLAND, OHIO



17,800 POUNDS PRESSURE

THE Movable Automatic Core that moves down with the pressure of the machine is entirely a new feature. It is a money-saving feature that practical concrete men cannot very well afford to overlook.

This is not the only feature that puts the Sanford right in the lead. The 17,800 pounds of pressure that is put on every block made is a point of advantage that cannot—**positively cannot**—be talked away. Right on the block comes the pressure—just as much force at close of day as in the morning. Speaking of this feature "Concrete Block" says: "It saves labor charge and has the additional advantage of being uniform throughout the day's work."

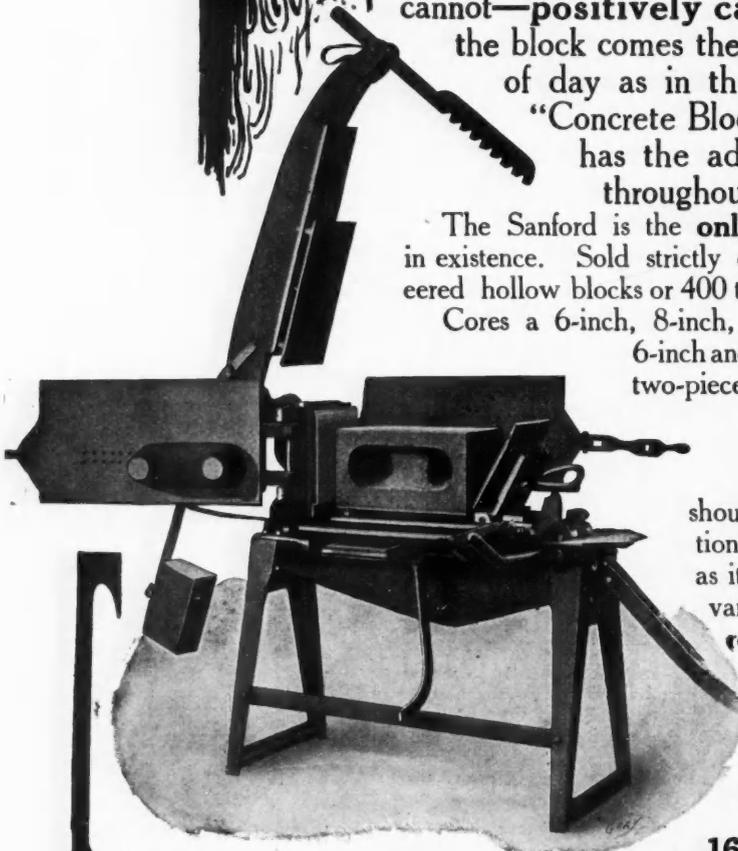
The Sanford is the **only** face-down hollow block pressure machine in existence. Sold strictly on its merits it will make 300 to 500 veneered hollow blocks or 400 to 600 veneered slab blocks every 8-hour day.

Cores a 6-inch, 8-inch, 10-inch and 12-inch single wall block, 6-inch and 8-inch high face veneer and hollow blocks, two-piece metal tie, two-piece Header bond System, same machine.

As a duty to your clients—to your pocket—to your common sense, you should look thoroughly into this proposition. The free book is just as convincing as it is interesting and proves the advantages of the Sanford are of more real benefit in practice than would appear. A postal to-day is all that's necessary.

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Sanford
Concrete
Machinery Co.**

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Trade-Mark—Sept. 12, 1905—July 15 1907



Size 2½"x4"x8½"

Positively Unequaled for Richness of Color
Perfection of Shading and Uniformity of Size

MANUFACTURED EXCLUSIVELY BY

Bradford Pressed Brick Company
BRADFORD, PA.

Standards, Romans, Moulded and Ornaments
Selected Brick for Mantels

Don't! Tamp Your Life Away “ Money ”

WHY?

Make 100 Strokes to produce a block
Make 100 Blocks a day

WHEN

You can produce a block with one stroke
You can make 2000 Blocks a day on
a machine that doesn't cost any more.

We could not show cut of Multiplex here and do it justice. But our catalog "R" illustrates and explains it in every detail.

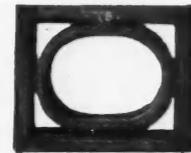
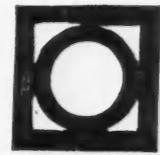
You can make all styles and sizes as well as chimney block on the one machine.

These statements are not advertising statements, we can prove it. Write

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**THE MULTIPLEX
CONCRETE MACHINE CO.**

ELMORE, OHIO



"Standard" Concrete Machinery "MACHINES OF QUALITY"



Is the fastest Hand Brick Machine on the Market; will make plain, veneered and ornamental face and shape; all perfect, smooth brick, true to size and design. Send for catalogue giving complete line of Mixers and Brick Machines.

SOUTH BEND MACHINE MFG. CO.
General Sales Offices, 40 Dearborn St.
CHICAGO, ILLINOIS



You Are
Interested
In Perfect
Blocks—

Blocks which can't be beat in *appearance*—Blocks which will *stand the test*—Blocks which are *accurate* as to *shape* and *size*. You are interested in being able to make such Blocks at the *Maximum Speed* and at the *Minimum Cost*. Let us show you the way.

Ask for Booklet.

**DAYTON
CONCRETE
MACHINE Co.**
Successor to
Detrick Concrete
Machine Co.
118 W. McPherson St.
DAYTON OHIO

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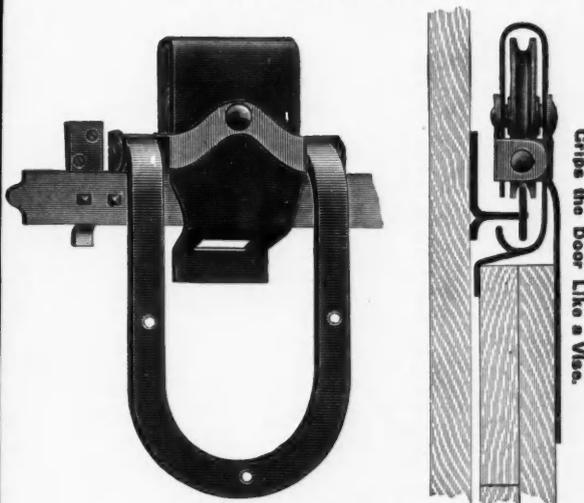
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American Cement Roofing Co.	127	Flanagan & Biedenweg Co., The	121	Nicholls Mfg. Co.	24
American Combined L. & Gr. Finder	18	Ford Mfg. Co.	93	North Bros. Mfg. Co.	17
Am. Floor Surfacing Machine Co.	4	Wm. Foster & Sons Co.	5	Northwestern Compo-Board Co.	21
American Luxfer Prism Co.	94	Foster-Munger Co., The	125	Northwestern Grille Works	16
American Rolling Mill Co.	21	Fox Machine Co.	107	Ohio Tool Co.	18
Am. School of Correspondence	115-121	Fox Mfg. Co.	5	Otis Elevator Co.	86
American Sea Green Slate Co.	84	Francisco Block Machine Co.	125	Orr & Lockett Co.	26
American Sheet & Tin Plate Co.	99	Gage Tool Co.	18	Parker Co., Chas.	18
American 3-Way Prism Co.	6	Georgia Marble Co., The	113	Patent Vulcanite Roof Co.	95
Anchor Concrete Stone Co.	120	Goodell Mfg. Co.	23	Pearson Mfg. Co.	4
Anderson & Co., Geo. H.	8	Goodell-Pratt Co.	18	Peerless Brick Machine Co.	120
Andrews Heating Co.	83-113	Gordon, Van Tine & Co.	Cover	People's Lumber Co.	115
Ashby, Geo. W.	114	Grand Rapids Hdwe. Co.	23	Perfection Mfg. Co.	119
Ashland Steel Range & Mfg. Co.	127	Gray Realty Co.	108	Pettyjohn Co., The	127
Ashley Sewage Disposal Co.	113	Hardin Co., John	12	Phillips Co., A. J.	8
Automatic Sash Holder Co.	16	Hartman-Sanders Co.	119	Phoenix Sliding Blind Co.	17
Bangor Slate Mining Co.	109	Hayden Automatic Block Machine Co.	124	Pioneer Roll Paper Co.	105
Bangor Structural Slate Co.	103	Haynes-Laugenberg Mfg. Co.	109	Prentiss Vise Co.	5
Barber Asphalt Paving Co., The	96	Helmerich & Co., W. H.	115	Progressive Mfg. Co.	20
Barnes & Co., W. F. & Jno.	4	Henderson & Co.	19	Pullman Mfg. Co.	26
Barrett Mfg. Co.	87	Hess Warming & Vent. Co.	89	Raynesford & Sons	10
Belden Machine Co., The	12	Hollister-Whitney Co.	121	Rehm Hardware Co.	19
Berger Mfg. Co., The	125	Holton & Weatherwax	122	Rodgers & Co., R. M.	25
Bishop & Co., Geo. H.	24	Hotel Seneca	121	Safety Rule Holder Co.	113
Bovee Grinder & Furnace Works	109	Hower, J. K.	113	Samson Cordage Works	12
Bradford Pressed Brick Co.	128	Hurley Machine Co.	12	Sanford Concrete Machinery Co.	128
Bradt Publishing Co.	119	Industrial Publication Co.	10-25-123	Sargent & Co.	14
Braunsdorf-Mueller Co.	22	International Corresp. Schools	101	Schaller-Hoerr & Co.	117
Burt Mfg. Co.	78	Interstate Equipment & Engraving Co.	3	Schleuter, M. L.	2
Caldwell & Drake Iron Works	116	Iszard-Warren Co., Inc.	14	Sedgwick Machine Works	5
Calhoun & Co., A. O.	15	Ives Co., H. B.	105	Seneca Falls Mfg. Co.	22
Canton Art Metal Co.	116	Jackson Co., F. M.	126	Sharon Hdwe. Mfg. Co.	Cover
Canton Mfg. Co.	109	Jenks, Benj. L.	96	Shelby Spring Hinge Co., The	24
Carborundum Co.	90	Johnson & Son, S. C.	7-85	Sheldon, E. H.	113
Cassens Mfg. Co.	115	Johnson Co., The E. J.	116	Shrp-Shvr Razor Co.	105
Central Machinery & Supply Co.	112	Johnston Mfg. Co.	109	Shultz, C. H.	124
Central Mantel Co.	107	Kanneberg Roofing & Ceiling Co.	118	Sidney Elevator Mfg. Co.	6
Champion Post Machine Co.	113	Karol, B. B.	8	Sidney Tool Co., The	9
Chicago Safety Lock Co.	23	Kawneer Mfg. Co.	79	Silver Lake Co.	23
Chicago Embossed Molding Co.	118	Keasbey & Mattison	106	Simmons Hardware Co.	103
Chicago Grille Works	116	Kees Mfg. Co., F. D.	20	Simonds Mfg. Co.	110
Chicago House Wrecking Co.	81	Knickerbocker Co., The	126	Slatington Slate Co.	119
Chicago Machinery Exchange	13	Long Distance Telephone Mfg. Co.	11	Smith Machine Co., H. B.	6
Chicago Spring Butt Co.	26	Lorenzen, Chas. F.	88	Somers Bros.	126
Classified Department	113	Lowe Bros. Co.	104	South Bend Machine Mfg. Co.	129
Climax Lock & Vent Co.	113	Lufkin Rule Co.	14	Standard Screen Co.	100
Concrete Stone Mold & Machine Co.	122	Lupton's Sons Co., David	92	Stanley Rule & Level Co.	17
Continental Natural Gas Alcohol Co.	123	McKenna, David	113	Starrett & Co., L. S.	4
Cordesman-Rechtin Co., The	25	Mallory Mfg Co.	16	Star Expansion Bolt Co.	17
Cortright Metal Roofing Co.	125	Marsh, H. C.	26	Stebbins Hardware Co.	23
Coulson & Co., J. W.	118	Marsh Co.	10	Stoddard, Dwight L.	122
Cowling, John P.	108	Marshalltown Trowel Co.	14	Stowell Mfg. Co.	107
Crescent Machine Co., The	20	Mattison Machine Works, C.	24	Sykes Metal Lath & Roofing Co.	Cover
Crookston Tool Co.	4	Mayhew Co., H. H.	16	Taylor Mfg. Co., James L.	6
Dayton Concrete Machine Co.	129	Mead Cycle Co.	105	Thomson Woodfinishing Co.	79
Deck Gravity Level Co.	99	Miles Mfg. Co., The P. B.	126	Tiffin Art Metal Co.	98
Defiance Machine Works, The	Cover	Millers Falls & Co.	25	Tower & Lyon Co.	9
Detroit Show Case Co.	107	Miller Mfg. Co., A. W.	20	Trussed Concrete Steel Co.	120
Diehl Novelty Co.	100	Milwaukee Steel Post Co.	122	Union Fibre Co.	118
Dietzen Co., Eugene	116	Miotke, Joseph	11	Union Metal Mfg. Co.	109
Disston & Sons Co., Henry	19	Miracle Pressed Stone Co.	123	United Roofing & Mfg. Co.	79
Dixon Crucible Co., The	19	Montross Metal Shingle Co.	5	Voltz Mfg. Co.	124
Down Wire & Iron Works	118	Morrill, Chas.	26	Wagner Mfg. Co.	25
Dunn & Co., W. E.	124	Mullins Co., The W. H.	103	Watrous Mfg. Co., E. L.	86
East Bangor Consolidated Slate Co.	119	Multiplex Concrete Machine Co.	129	Weber Mfg. Co.	11
Eastern Granite Roofing Co.	108	Mulvey Mfg Co., Chas.	19	Willebrands Machine Co.	9
Edgerton Mfg. Co., C. A.	78	Myers & Bro., F. E.	22	Woods, A. W.	116
Edwards Mfg. Co., The	104			Zimmermann & Co., Harry	124

NOTICE TO ADVERTISERS

New copy, changes and corrections for advertisements must reach office of American Carpenter and Builder, 185 Jackson Boulevard, Chicago, not later than April 20 in order to insure insertion in May number.

**THE SHARON FLEXIBLE No. 1
BARN and WAREHOUSE DOOR HANGER**

The Strongest and Best Hanger Made.
The Reinforced Frame Gives Double Support to the
Drop Straps and Axle



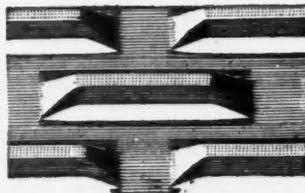
Cribs the Door Like a Vice.

PATENT PENDING

Write for our Illustrated Hanger Booklet. A post card
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SHARON HARDWARE MFG. CO.,
Builders' Hardware - - - Sharon, Pa.

SYKES METAL LATH



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

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

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

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

NO PICKLED LATH

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

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

Samples and prices mailed upon request.

Sykes Metal Lath & Roofing Co.
NILES, OHIO



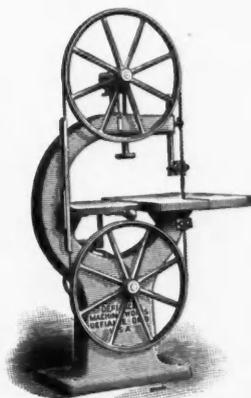
“DEFIANCE” HIGH GRADE

Wood-Working Machinery

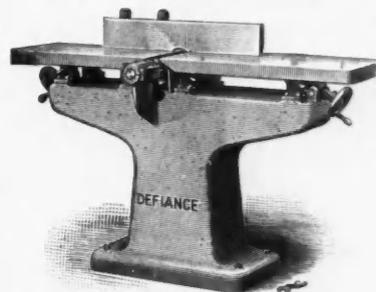
Invented and Built By
The Defiance Machine Works
Defiance, Ohio

For Manufacturing General Wood-Work

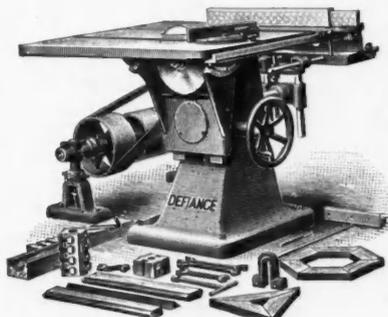
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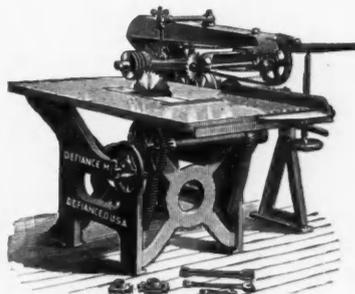
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12" Hand Feed Planer with or without Boring Attachment



No. 8 Variety Saw



No. 3 Power Feed Rip Saw

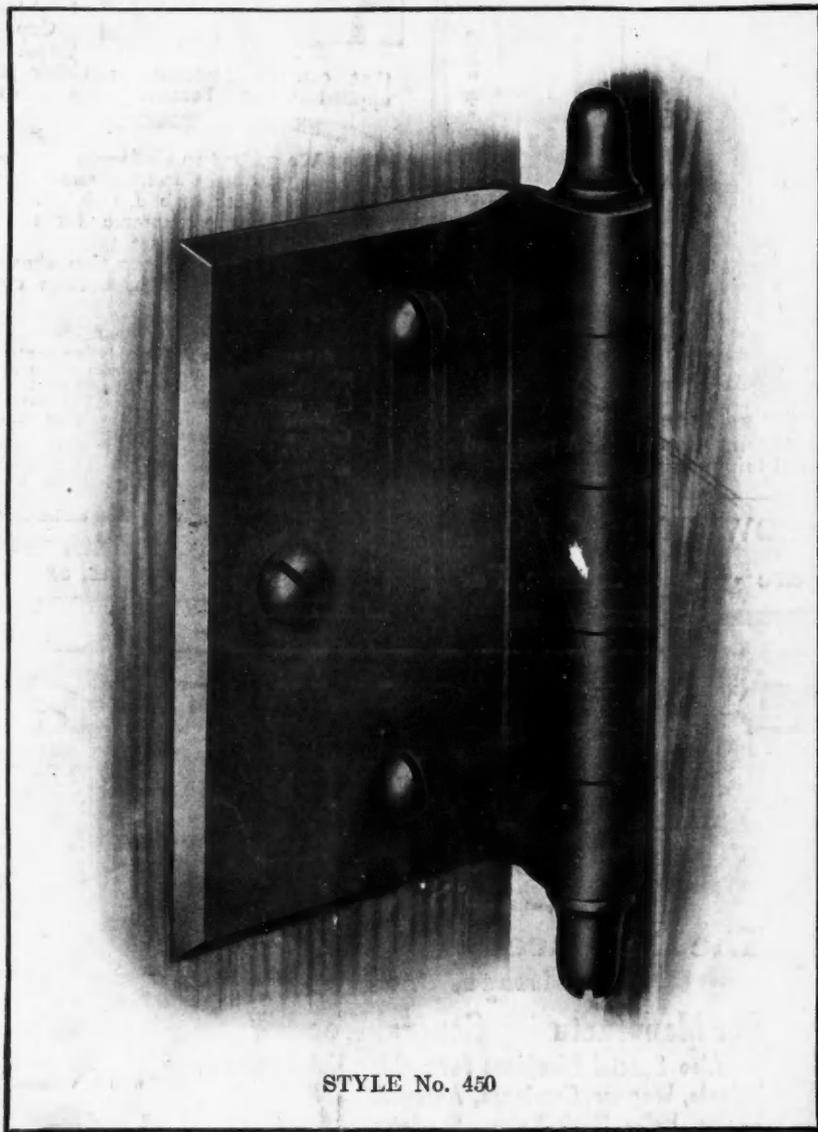


24" Single Surface Planer

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"We Initiate—Never Imitate"

THE
"National Beauty"



STYLE No. 450

An Ornamental Butt of High Degree

Made of cold-rolled Steel, highly polished and double plated. Beveled edges—slot in false tip for screw-driver. Save half the time in hanging doors. Ask for booklet "Ornamental Ideas." It contains valuable information.

**NATIONAL MFG. CO., STERLING,
ILLINOIS**