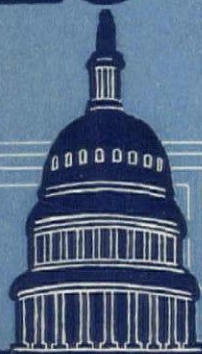





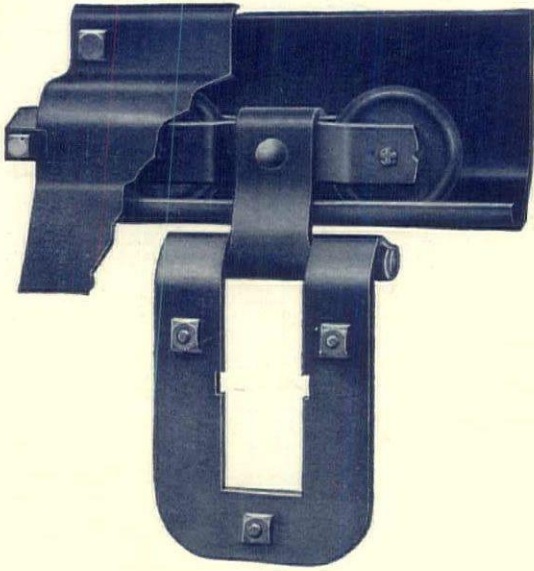
THE NATIONAL BUILDER

NOVEMBER
1914

PRICE
15¢



This number contains complete working plans with estimates and description of a 6 room bungalow built at Norwood Park Ill.   



Improved Storm-Proof Hangers

THE changes we have recently made in the construction of these goods will interest you if you ever have occasion to install sliding barn door hangers and rail.

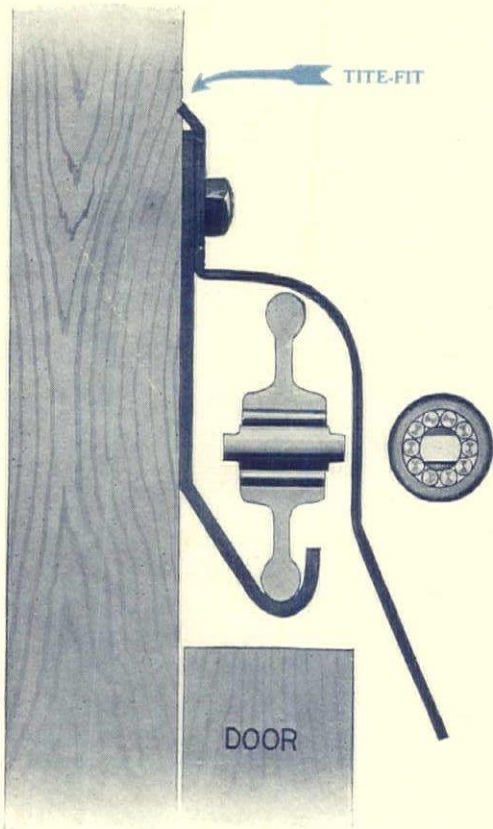
The drop strap on the hanger has been shortened, bringing the rail closer up to the track. Oil holes have also been added.

Storm-Proof Rail

is now made with the cover $1\frac{1}{4}$ inches longer than formerly, giving ample protection to the opening between rail and top of door. The cover-splice has been eliminated, and a dove-tail joint is used instead. A new style end-cap is also provided.

Here is the perfect sliding barn door equipment. It will pay you to get the illustrated circular describing these goods. Your dealer's name will be appreciated.

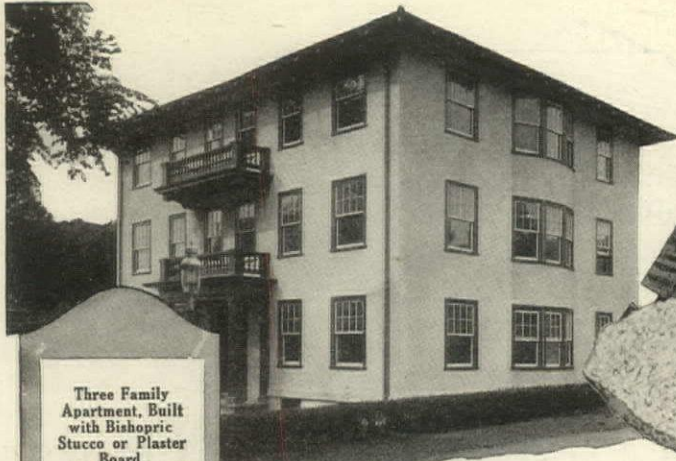
National Mfg. Co.
Sterling - Illinois



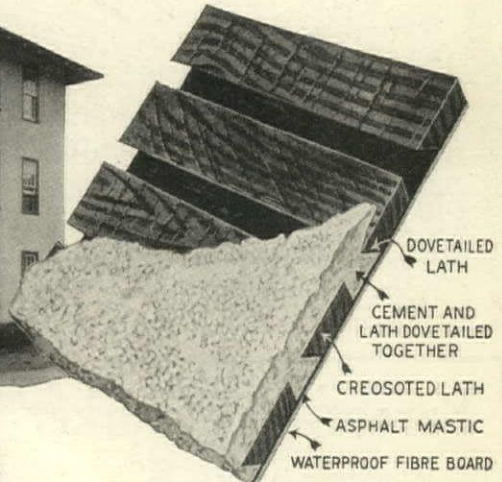
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Three Family Apartment, Built with Bishopric Stucco or Plaster Board. Ed. F. Freeman, Owner and Builder Roxbury, Mass.



Bishopric STUCCO or PLASTER BOARD

Built on the Wisdom of the Ages~

A modern combination of materials and principles that ages of actual use have proven the most efficient in building construction

The Dovetailed Lath

Centuries ago the artisan recognized the utility of the dovetailed joint in building construction; and since then every master builder has used the dovetailed joint where a permanent, lasting and efficient joint was desired.

The cement, stucco or plaster dovetails into the Bishopric Stucco or Plaster Board and is held absolutely firm, so that cracking or crumbling is impossible. The covering becomes a part of the board and will last for ages.

The Creosoted Lath
Creosote is a wood

preservative. It is customary to creosote wood that is exposed to severe weather conditions—railroad ties for instance. The lath in the Bishopric Stucco Board are creosoted.

The Asphalt Mastic

Covering one side of the card board is the toughened As-

phalt Mastic in which the lath are imbedded. Asphalt Mastic is moisture-proof, fire-resisting and a wonderful preservative. Asphalt was the important element used by the ancient Egyptians to preserve their mummies.

The Heavy Fibre Board

Paper and paper board is so extensively used in building construction that its advantages need hardly be mentioned. It forms a very important part of the Bishopric Stucco Board, not only for its protection against heat and cold but also because it is a sound deadener.



Plaster and cement walls cannot crack if Bishopric Stucco or Plaster Board is used

—because Bishopric Stucco Board is right scientifically. It is built on principles that have been tested and proven the best, not for years, but for *centuries*.

—because Bishopric Stucco Board is right in practice. Years of the severest tests under all conditions prove absolutely that in actual use Bishopric Stucco Board is unequalled

Better Walls — Less Money

Write at once for **FREE SAMPLES OF BISHOPRIC STUCCO OR PLASTER BOARD** and our illustrated book "*Durable Homes by the Bishopric System*" illustrating buildings of all kinds on which Bishopric Stucco Board has been used. This book also contains letters from Builders, Architects and users of Bishopric Stucco Board and furnishes facts and figures to prove that it cuts the cost 25%.

THE MASTIC WALL BOARD AND ROOFING COMPANY
605 Este Avenue - - - Cincinnati, Ohio

Building Principles that have been Tested for Ages

PASTE THIS DOME ON LETTERS YOU WRITE TO ADVERTISERS. IT HELPS.



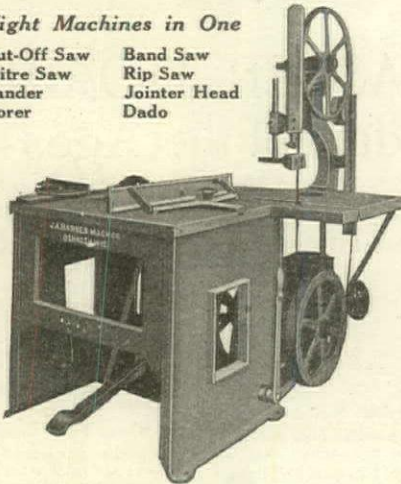
IMPERVITE is Guaranteed to Waterproof Walls, Cellars & Pits. A facing of **IMPERVITE MORTAR** on the inside will resist water on the outside.

ASK FOR BOOK 13 The Standard Paint Co. NEW YORK BOSTON CHICAGO

Barnes' Woodworker

Eight Machines in One

- Cut-Off Saw
- Mitre Saw
- Sander
- Borer
- Band Saw
- Rip Saw
- Jointer Head
- Dado



This is an ideal machine for building contractors. Operated by any kind of power. Many other machines for the woodworker.

Write For Cut Prices

J. A. BARNES MACHINE CO.
125 Marion Street Oshkosh, Wisconsin

Wood-Mosaic Floors

Plain and Ornamental Parquetry, Wood-Carpet, Strips

We have been manufacturing flooring for more than twenty-five years.

Our material is stored in heated stock rooms until the moment of shipment, so that troubles incident to the use of ordinary lumber yard flooring are avoided.

We have agents who are experts in the principal cities. In the smaller cities and towns our flooring can be handled profitably by any progressive carpenter in the place. No investment required if material is not carried in stock.

We will aid you in every way possible. On receipt of accurate measurements of any room or rooms you may wish to quote on, we shall be pleased to furnish colored sketch with exact estimate of cost of the flooring required. Instructions for laying and finishing accompany all orders shipped.

Send for free copy of booklet "Wood-Mosaic Floors."

Catalogued in Sweet's Index

Wood-Mosaic Company
33 Hebard St. Rochester, N. Y.

Saw Mill and Flooring Factory: New Albany, Indiana
Sales Office and Parquetry Factory: Rochester, New York



Prestige the Reflection of Quality

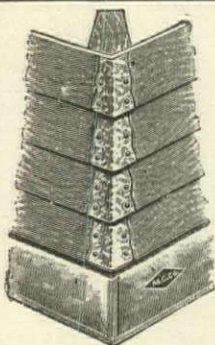
"MILCOR"

METAL BUILDING CORNERS

Metal Corners are being very extensively used and are very popular with the carpenter. They take the place of corner boards to finish the corner of the building when weather board or lap siding is used. Time and expense are saved because it is not necessary to mitre the weather board siding. The mitre effect is perfect and the appearance superior to wood corner board. *Write for samples and prices.*

Made from tight coated galvanized steel. Furnished in two sizes. 4 inch and 6 inch inside and outside. Packed 500 corners per box.

Milwaukee Corrugating Company MILWAUKEE, WISCONSIN
Branch: Kansas City, Mo.



Showing Outside Corner Applied



Outside Corner



Inside Corner

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ON LETTERS YOU
TISERS. IT HELPS.



How Much Money do you make when two of your best men are busy playing checkers and the others are busy watching them? At such time the wise contractor reads

“More Work for the Winter,”

and then goes out to get his share of it. That is what you will do as soon as you have learned *how to get orders for new floor*



Your Men Will Prefer Laying Maple, Beech or Birch Floors

to loafing about the shop. Their work will keep you in touch with people who want things and bring those people to you for them.

You Will Make Lifelong Friends

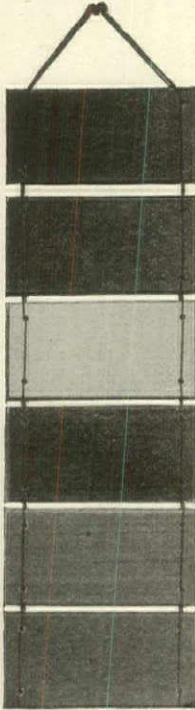
of every person for whom you put in a modern hardwood floor. Your lumber dealer has the flooring—or can get it—you have the labor and the owner of the building has the money to pay for the job.



Anyone Visiting Your Shop

ten days after you decide to get busy will not recognize the place. You CAN do this for others ARE doing it. Write TODAY for instructions.

Maple Flooring Manufacturers' Assn.
Stock Exchange Building **Chicago, Illinois**



“Birch Interiors”

A big, new book of 40 beautiful pages illustrating modern halls, stairways, living rooms, dining rooms, fireplaces and floor plans—shows styles of interior finish and color schemes that every contractor and builder is looking for.

Six Birch Panels

each 3 x 5 inches in size, as here illustrated, carrying the following reliable stains:

Silver Gray
Filipino

Brown Mahogany
Light Oak

Dutch Brown
Medium Mahogany

The Book and Panels will interest and please you. They are sent postpaid.

Write Today For Birch Book “D” and the Panels

**The Northern Hemlock & Hardwood
Manufacturers Association**

Department D

Wausau, Wisconsin

Before Building or Remodeling

Send for

“Vogue in Fire Places”



¶ The largest and most complete catalog on fire places ever published. Describes in detail the most complete line of Colonial, Mission and Standard Mantels

in the country. Also brick mantels and a large selection of fire place fixtures, consoles, colonnades, tile floors, mosaics, etc. Distributed free. ¶ Write for special discount to Contractors and Builders.

CHAS. F. LORENZEN & CO.

101 North Clark St.

Chicago, Illinois



NICKERSON COLUMNS...

are preferred by those architects, contractors and owners who know most about column construction, because:

Of their style, proportions and durability.
The Double Lock Joint Construction insures quality.

Workmanship Guaranteed.

“Vignola” is our standard for proportions when architect’s details are not furnished.

Interior Trim to detail.
Send for Catalog No. 4.

Nickerson Mfg. Co.
Knoxville : : Tennessee

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A 6-Year Shingle Nail Test

Made by Nature--Showing the Effect of Rust and Oxide on Wood Shingles



Which are You Specifying and Buying for Your Shingling Jobs?

1st Row at Left

Are Galvanized Wire Shingle Nails.

2nd Row

Are Common Iron Cut Shingle Nails.

3rd Row

Are Common Wire Shingle Nails.

Results—Cracked board—Nails badly rusted and ready to break—wood rotted about nails.

4th Row
are Zinc City Shingle Nails

This nail was removed and the hole enlarged to show that there is no cracking or rotting of wood where Zinc City Shingle Nails are used.

Price 12½c per pound. If not at your dealers, send order direct to us. We ship promptly.

Zinc has a tendency to preserve wood, preventing decay and cracking. It is the oxide of the zinc—and zinc is the stuff the Zinc City Shingle Nails are made of—that preserves. It is the rust in the ordinary shingle nail that rots and cracks the shingles often within three years after nailing.

So—Specify and buy Zinc City Shingle Nails, guaranteed pure zinc—absolutely rust proof—clean to handle—easy to drive—and the nail that makes the wood shingle roof or siding last half a century or more. It is the only shingle nail you can afford to use.

Write for Free 1-2 Pound Box of These Nails and Test Them

W. H. MAZE COMPANY :: MANUFACTURERS :: PERU, ILL.

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Satisfaction is Assured
When You Use

Oak Flooring

When you build residences or apartment houses it is good policy to forestall the tenant's or buyer's wishes. Nine out of ten want **Oak Floors**.

OAK FLOORING means "easy to rent" and "easy to sell" and represents the best kind of investment that enters into the construction of a home. Its durable and artistic qualities make it **America's best and finest flooring**.

OAK FLOORING $\frac{3}{8}$ " by $1\frac{1}{2}$ " or 2" face can be laid over old floors in old homes or over cheap sub-floors in new homes at a **very low cost**. It's **cheaper** and far better than carpets or pine flooring.

OAK FLOORING laid forty years ago in public buildings, after very hard service, is still in **good condition**. For **durability**, **OAK** is the best.

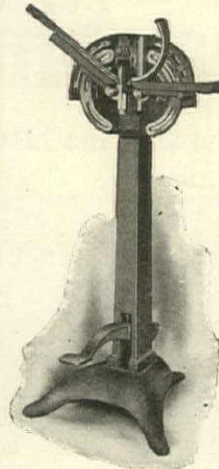
There is **solid satisfaction** and **lasting pleasure** in the **substantial** and **dignified** appearance of **OAK FLOORING**.

A **carpenter** or **handy man** can lay **OAK FLOORING** successfully. It is profitable work as a side line for any carpenter.

OAK FLOORING is made in seven different grades, representing different prices to fit the pocketbook or condition under which they are used.

Write for Booklet

The Oak Flooring Bureau
897 Hammond Bldg., Detroit, Michigan



Guaranteed
to Save
75%

Fitting Diamond
Light or Fancy
Sash

Your Money Back If
It Doesn't

We guarantee the American Sash Trimmer to save at least 75 per cent of the cost of fitting diamond light and fancy sash by hand.

Also, that joints fitted with it are far superior to those fitted by hand. Why not let us send you a machine on trial?

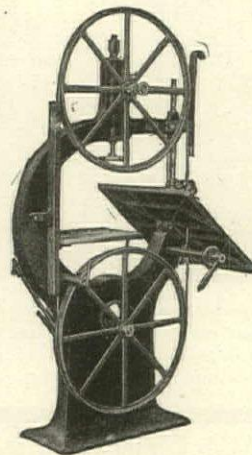
If the machine does not come up to our guaranty, you may return it by freight at our expense. Everything to gain and nothing to lose.

Send for particulars of our free trial offer

THE HEALD MACHINE CO.
36 New Bond Street Worcester, Mass.
24 South Jefferson Street, CHICAGO, ILL.

Band Saws

OF QUALITY



Put them to the test and you'll find that they are no toys. They will do your work and do it well. Their accurate design, rigidity, convenience of operation and moderate price explains their popularity. Catalogue covers full line of Jointers, Saw Tables and Swing Saws, also.

The Silver Mfg. Co.
340 Broadway SALEM, OHIO

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CYPRESS "The Wood Eternal"

Makes the very best ridge boards, corner boards, facings for window and door frames, because CYPRESS "stays put" about the best of any wood in these trying uses. CYPRESS takes paint perfectly, but what's more and better about it is that *without any paint it lasts "practically forever."* Also Cypress is famous for "staying put."

THE BEST WOOD FOR YOUR CUSTOMER TO USE
IS THE BEST WOOD FOR YOU TO RECOMMEND

Let our "Contractors' Help Department" help YOU. Our entire resources are at your service with Reliable Counsel.
We invite Correspondence with a serious purpose in it.

Southern Cypress Manufacturers' Association

1212 HIBERNIA BANK BUILDING, NEW ORLEANS, LA.

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

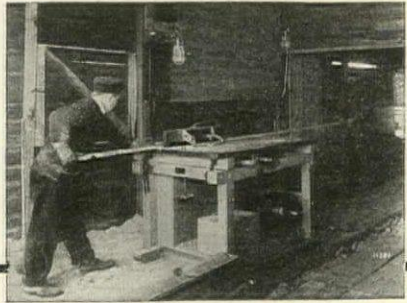
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C.H.&E. PORTABLE SAW RIGS

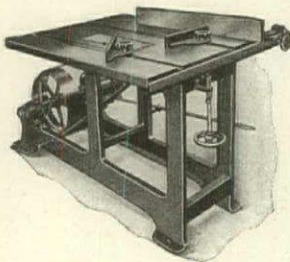
C. H. & E. Portable Saw Rigs are manufactured in six sizes. Ripping capacity from 1 to 6 inches. We also manufacture Hoists, Material Elevators, Mortar and Plaster Mixers, Pumps and Engines. We lead, others follow.



■ ■ ■ WRITE FOR CATALOG ■ ■ ■

C. H. & E. Manufacturing Co., Inc. : 319 Mineral St., Milwaukee, Wis.

No Carpenter Shop Will be Complete for the Winter Season Without an Equipment of Machinery!

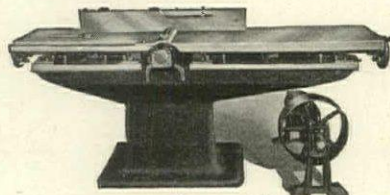


No. 4 Saw Bench

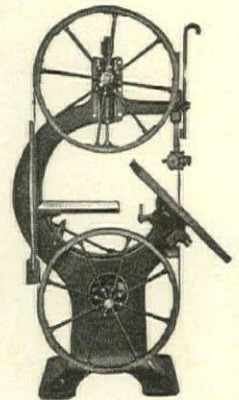
Send for Catalog No. 18 and new net price list. We have largest assortment of modern, up-to-date woodworking tools at popular prices on the market. Get our liberal proposition; it costs nothing to investigate and will eventually mean the saving of many dollars.

The "Famous" line offers a choice of any sort of equipment wanted or best suited to local conditions.

Band Saws (4 sizes, 10 different styles). **Saw Benches** (8 sizes and styles for all varieties of work). **Swing Cut-Off Saws** (11 different styles and sizes). **Hand Jointers** (4 sizes, 3 with planer attachment). **Pony Planers** (3 sizes, in 4 styles). **Single and Double Spindle Shapers, Vertical Hollow Chisel Morticers and Combination Morticer and Tenoner. Post Borers** (3 styles). **Lathes** (4 sizes for wood-turning, 5 sizes for pattern-making). **Universal Woodworkers** (54 different styles and any combination wanted for any purpose).



8, 12, 16 and 20 inch Jointers



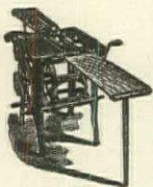
20, 27, 32 and 36 in. Band Saws

Don't Forget to Mention Catalog No. 18

The Sidney Tool Company - - - Sidney, Ohio

CARPENTERS! BUILDERS!

Our new foot and hand power Circular Saw No. 4 is the strongest, most powerful and in every way the best machine of its kind. For ripping, cross-cutting, boring, grooving, dadoing, etc.



I. For Ripping.

SEND FOR OUR NEW CATALOG on Foot and Hand Power Machinery,

Lathes, Scroll Saws, Formers, Mortisers, Tenoners, Etc.



II. For Cross-cutting.

Solid Iron Table Planed Perfectly True—Counter-Shaft if desired



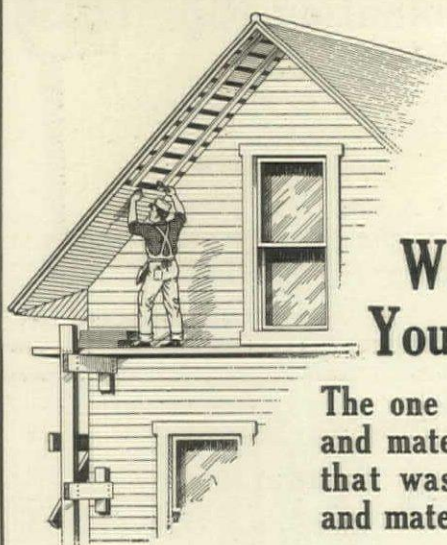
III. With Universal Mitre Gauge.

W. F. & JOHN BARNES CO., 436 Ruby Street, ROCKFORD, ILLINOIS

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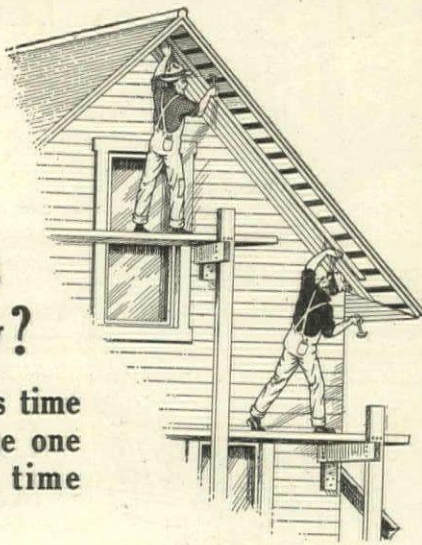


ON LETTERS YOU TISERS. IT HELPS.



Which is Your Way?

The one that saves time
and material or the one
that wastes both time
and material?



It takes two men to install Arkansas Soft Pine ceiling when used for plancier and run lengthwise the cornice. One man can do the work quicker if the ceiling is run crosswise.

In the first case the lines run in the wrong direction. The second method is correct from architectural and common-sense viewpoints.

Ask Your Dealer For Information About

Arkansas Soft Pine Short Length

Ceiling, siding, flooring. They cost less than standard lengths, their use involves less waste and requires less time.

Quality—This is genuine Arkansas Soft Pine stock of superior value. There is no method by which the contractor can make money so easily as by insisting on adequate quantities of 4, 5, 6, 7, 8 and 9 foot stock, ordering such quantities as can be used to advantage.

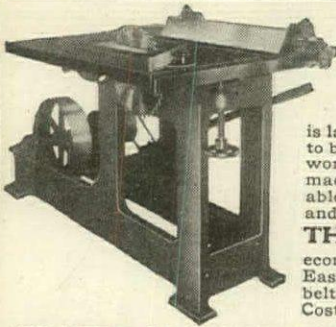
Send for your copy of "The Use Book." It contains
much information of value to the contractor

Arkansas Soft Pine Bureau
1738 Transportation Bldg. Chicago, Illinois

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This Combination Rip and Cut-Off Saw--

is large enough, small enough, strong enough, and low enough in price to be a part of every building contractor's equipment. Combines the working qualities of a rip saw, cut-off saw, dado machine, grooving machine borer, etc. One piece solid base, one piece solid table. Adjustable countershaft for endless belt. Unusually durable, serviceable and economical.

THIS SWING SAW IS A BIG--

economy wherever there's much sawing to be done. Removable head. Easily adjusted for rebabiting boxes. Furnished for either motor or belt drive. Very simple, very strong and a sure time and labor saver. Cost moderate. Get a copy of our complete catalog.

SLATER, MARSDEN & WHITMORE CO.,

BELOIT, WISCONSIN

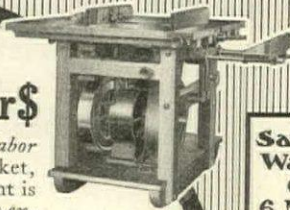


Use Sense — Make Dollar\$

Every saving of *time and labor* puts *money* into your pocket, Mr. Contractor! What you want is to do the job at the *least possible expense*, and your *common sense* tells you that it's a *good investment* to put your money into machines that *cut the cost*. Hundreds of contractors have *proved* the *money-saving* and *money-earning* ability of

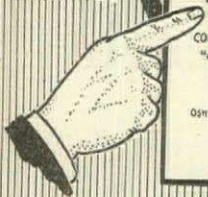
EVEREADY SAW RIGS

The Oshkosh "Eveready" Rigs make good on the job. They stand up to the work and do everything you ask of them. Extra sturdy construction, yet easily moved about; simple, easy to operate; powerful engine—bore 4 1/2", stroke 6 in. Besides cross-cutting and rip-sawing, the "EVEREADY" joints, sands, jig-saws, grooves, bores, miters and grinds tools. Send for the Big Oshkosh Catalog.



Saves Wages Of 6 Men

Send for It!

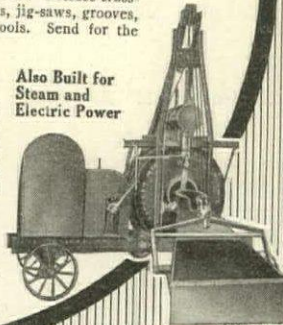


Oshkosh Mixers

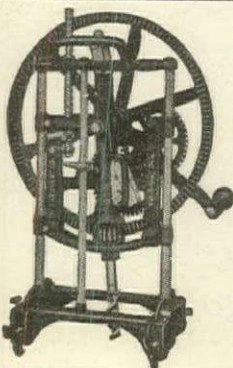
It will pay any contractor to get acquainted with the Oshkosh Mixer. It's a big money-saver—and we can prove it! Request brings full information, prices and special offer.

Live Agents Wanted in Open Territory
OSHKOSH MFG. CO.
 414 So. Main St.,
 Oshkosh, Wisconsin

Also Built for Steam and Electric Power



The Effective 4-Way Mix



10 Days' Free Trial AT OUR RISK

You do not need to send us a cent until you have convinced yourself that the **Champion Mortiser** will cut a perfect mortise in two or three minutes.

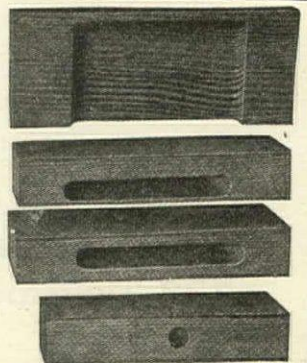
Ten days' test will prove its ability to save its total cost on the first job—before you buy it. You take no risk.

Can be used on any door lock, sash, screen frame, cabinet work, etc. Adjustable from perfect round hole to 6 1/4" slot.

CHAMPION MORTISER

is equipped with ball bearings, large gears and automatic stop. Easy working. Cuts perfectly. Mortises in hard or soft wood, through knots, with or against the grain. No other tool required. Write today for circular and particulars.

COLGAN MACHINERY & SUPPLY CO.
 610 New Hayden Bldg. Columbus, Ohio



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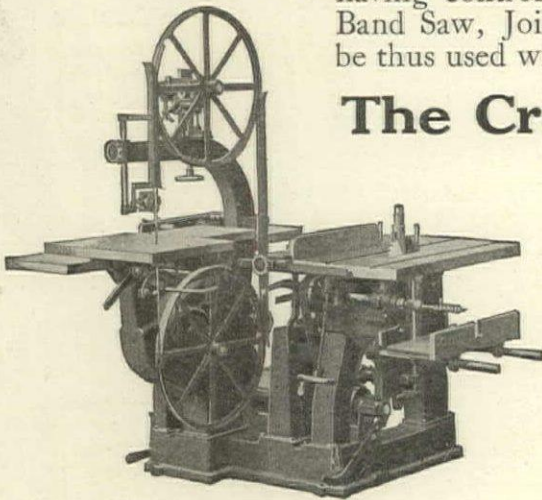
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The New Model Crescent Universal Woodworker



Is a machine designed especially to meet the requirements of the Building Contractor. The one machine gives you the services of a complete planing mill right in your own shop.

The Crescent Machine proper consists of five principal parts, Band Saw, Jointer, Saw Table, Shaper and Borer. As many as four of the machines can be operated at one time, each operator having control over his own machine; the Band Saw, Jointer, Shaper and Borer may be thus used without interference.



The Crescent Will Do

- | | |
|---------------|----------------|
| Band Sawing | Jointing |
| Cross Cutting | Sawing |
| Ripping | Boring |
| Resawing | Tenoning |
| Panel Raising | Dadoing |
| Grooving | Knife Grinding |
| Disk Grinding | and |
| Sanding | Mortising |

This new model is built along similar lines to our famous No. 101, of lighter construction (not too light) and lower priced, will do the same kinds of work in a most satisfactory manner. This is a most efficient machine and splendid value for the money.

We offer you a machine that once installed in your shop will save you time, worry and money—you owe it to yourself to fully investigate the claims we make for this new model.

Our New 144-Page Catalog

Gladly sent on request. Tells all about the new model Crescent and what it will do for you. Write for this book now—*today*.

The Crescent Machine Co.

10 Main Street

Leetonia, Ohio

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F. W. Logan



M. J. Mendelsohn



S. Wolstencroft



N. E. Duffey

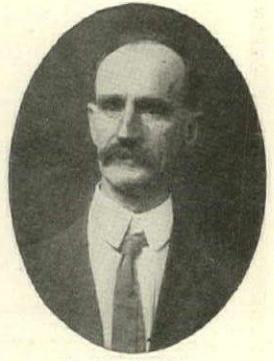
The National Builder Live Wires

These men whose photographs are shown are the subscription representatives of the NATIONAL BUILDER. They are out on the firing line where the building is going on and you are likely to receive a visit from them some time during the present season.

No Inducements Offered

The NATIONAL BUILDER is sold only on the merits of the matter in the publication. No books or other prizes are given in order to induce subscriptions. Fred T. Hodgson, the Editor, is the author of the Steel Square, Modern Carpentry and other works with which you are entirely familiar. The writers in the paper are all practical men, not theorists. The Managing Editor, Charles A. Miller, Jr., is a man who has served in every phase of the building industry.

Each one of these subscription men carries an identification card, signed by the President and attested by the seal of the Company so anyone may have no hesitation whatsoever in dealing with these representatives.



S. O. McCalla



A. Baker Metcalfe



John F. Toner



W. W. Werner



Homer McFarland



H. C. Chadwick



H. A. Douglas



F. L. Gehr



No matter what Your Plastering Problems are—they are Easily Solved if you Use

Kno-Burn

Expanded Metal Lath
The Perfect Plaster Base

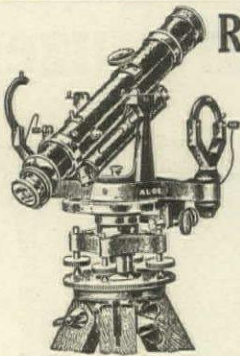
Constructed with a mesh that grips the plaster so that it cannot loosen. Prevents cracking—never sags or buckles — fireproof — easy to apply — made from U. S. Standard Gauge Sheets.

It's the only plaster base you should use whether for a large mansion or a small bungalow.

Send for Our Free Booklet, "Metal Lath Details"

and find out about the many uses of this Lath. Write today—now.

North Western Expanded Metal Co., 905 Old Colony Bldg., Chicago



Rent This Level 10 Months, Then It's Yours

Builders — Contractors — This is not the old style Architect's Level. It is the newest model **convertible** level. There is not a single Builder or Contractor who has not almost daily need for this instrument. For laying out buildings, locating foundation piers, leveling up foundations, walls and floors, aligning shafting, walls, piers, etc., for getting angles, locating levels anywhere, ditching, laying streets and walks, running straight lines, and a hundred other uses.

Instruction Book Free

Complete illustrated booklet telling how a builder or contractor can use the convertible level sent free on request.

Send Coupon—No Obligation

Send the attached coupon today and we'll send illustrated booklet and complete details of how you can own the Aloe Convertible Level for 10 months' rent.

A. S. Aloe Co., 613 Olive St., St. Louis, Mo.

WARNING.
The Level we offer is the Aloe Convertible Level. Don't confuse the Convertible Level with the ordinary style Architect's Level. The only work that can be satisfactorily done with the ordinary Architect's Level is the determining of elevations. But the Convertible Level, besides its use as a level, is a modified transit and broadens the use of the level 100%. You can't afford to buy any but the Aloe Convertible Level.

HALF CENTURY REPUTATION.
We have been manufacturers of transits and levels since 1863 and our instruments are the standard of the world.

FREE TRIAL.

We allow you to convince yourself by a trial of the instrument before you obligate yourself.

THE RENT BUYS IT.

No large cash outlay needed. Just pay the monthly rent for a few months and the instrument automatically becomes your own property.

COUPON

A. S. Aloe Co.
613 Olive St., St. Louis, Mo.

Please send free instruction book on the use of the Convertible Level and complete details of your rental plan. This request in no way obligates me.

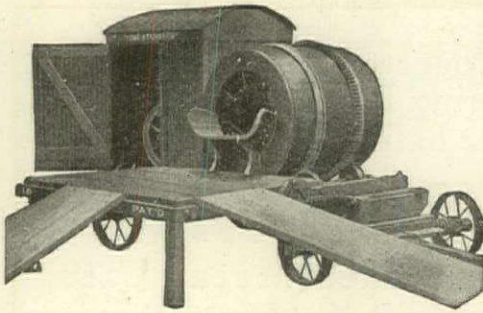
Name
Occupation
Street
City State.....

National Builder, Nov., 1914

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HAVE YOU A COPY

of

**"The STANDARD"
LOW-CHARGING**

Catalog No. 32-11?

It contains information on concrete machinery that every contractor should know. The principle of our low-charging mixers is different from all other methods. Instead of high-charging chutes and complicated loading skips as on many mixers, "The STANDARDS" are built low to the ground.

City councils and engineers are demanding that all concrete laid for their cities be mixed with batch type mixers. Do you own a mixer of this type? The open drum of "The STANDARD" permits constant inspection. It is the mixer that will insure you perfect work. It is simple in design and consequently you have few repair bills. Just say you're interested in low-charging and a catalog will be sent.

The Standard Scale & Supply Company

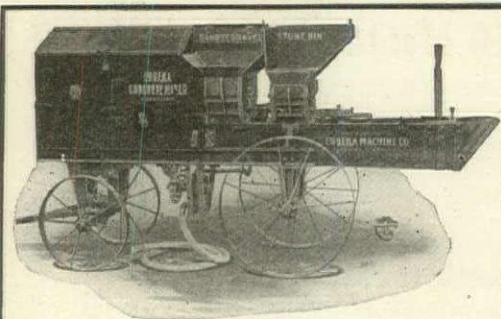
NEW YORK
136 West Broadway

PHILADELPHIA
35 South Fourth St.

PITTSBURGH
243-45 Water St.

CLEVELAND
1547 Columbus Road

CHICAGO
1345-47 Wabash Ave



We have some mighty interesting facts for you about the

EUREKA SELF MEASURING MIXER

"WHERE GUESS WORK ENDS"

May we show you these things in a clean cut way—no business man to another—no extravagant claims, no glittering generalities, JUST PROOFS AND FACTS THAT HAVE AN IMPORTANT BEARING ON YOUR WORK.

GASOLINE, STEAM OR ELECTRIC POWER

It costs you less than half as much to buy it!
It costs you less than a third as much to run it!
It costs you less than a fifth as much to move it!

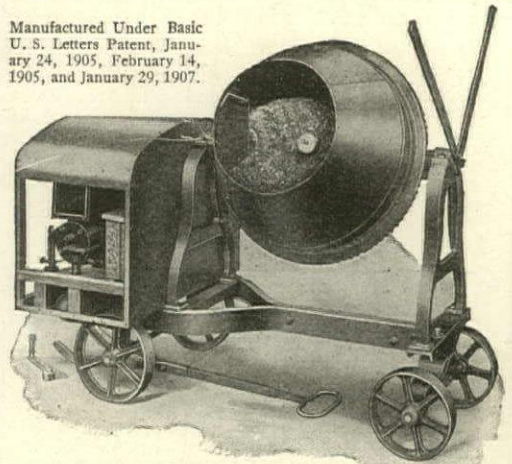
The Eureka Mixer, capacity for capacity, with any standard batch mixer, weighs less than half as much.

Powerful, Simple, Easy to Operate. Its Cost is Surprisingly Low. Send for the Facts Now.

Eureka Machine Company
18 Case Street - Lansing, Michigan

The Van Duzen

Manufactured Under Basic U. S. Letters Patent, January 24, 1905, February 14, 1905, and January 29, 1907.



ARE you in business for your health or to MAKE MONEY? This machine will add from \$8.00 to \$15.00 a day to your PROFITS.

Capacity 1-6 yard per mix. Fifty yards per day. Get our price—we will get your order. Before buying a mixer compare the dimensions and construction of the VAN DUZEN with others. Get the facts, don't judge by the pictures. Size over all, 3 ft. 6 in. by 6 ft. 6 in. Three mixing plows in drum. Largest diameter of drum, 34 inches. Top half of drum 14-gauge steel plate; bottom cast iron. Opening of drum, 21 inches. Depth of drum, 30 inches. 2 1-2 H. P. engine. Mixer revolves on ball-bearings. Weight 1500 pounds.

THE VAN DUZEN-ROYS COMPANY
Southwest Corner State and Third Sts., Columbus, Ohio

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See pages
99 and 100
September
Number



A Bostwick
Truss-Loop
Garage

Garage at Glen Ridge, New Jersey. George Linn, Esq., Owner

BOSTWICK TRUSS-LOOP METAL LATH
ON 20 TO 24-INCH CENTRES

Perfectly Safe for this Construction; Economical, Fireproof, Permanent

THE BOSTWICK STEEL LATH CO. - - NILES, OHIO

Stand Erect
—and Do Better Work

Cut out working on your knees and straining your back when laying cement sidewalks. Stand up to your spreading, surfacing, grooving and finishing by using **STANDARD Long Handled Cement Finishing Tools**.

And besides saving labor you can actually do the work better—cleaner—more even—quicker. All operations are manipulated by the handle. And Standard Tools don't cost much! Our Long Handled Cement Trowels sell for \$8.00—and our other trowels, hand floats, hawks, etc. are just as low priced. Don't fail to write now for catalog of our complete line—it's free.

Standard Tool & Mfg. Co.
27 Industrial Bldg. Indianapolis, Ind.



\$300 in 30 Days!



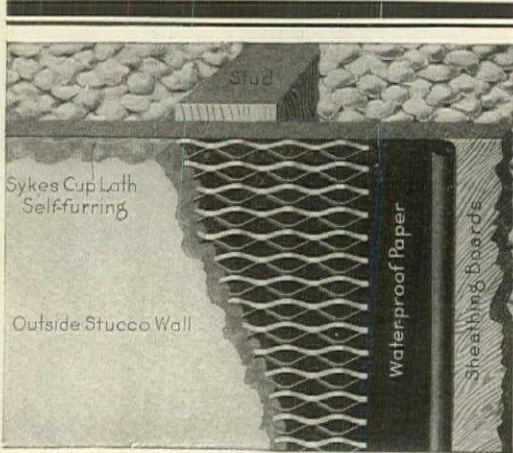
Made by one Robinson salesman. You—yourself—can positively make \$60 and expenses every week. I want men like you, hustling, energetic, ambitious fellows, anxious to make money, who are willing to work with me. Not for me, but with me. I want you to advertise, sell, and appoint local agents for the biggest, most sensational seller in 50 years—the **ROBINSON FOLDING BATH TUB**. Here's an absolutely new invention that has taken the entire country by storm. Nothing else like it. Gives every home a modern up-to-date bathroom in any part of the house. No plumbing, no waterworks needed. Folds in small roll, handy as an umbrella. Self-emptying and positively unbreakable. Absolutely guaranteed for 5 years. Hustlers, east, north, west, south,—coining money. Orders, orders, every where. Badly wanted, eagerly bought, for remember, *fully 70% of homes have no bath-rooms*. Immense profits for you. Two sales a day means \$300 a month. Here's proof—real proof. Breeze, of Idaho, made \$400 profit in 30 days. A. Bernider, Kansas, made \$30 in four hours. Hamlington, of Wyo., made \$60 first two days. Hundreds like that. Pleasant, permanent, fascinating work. This is not idle talk. Make me prove it. Write a postcard. Let me write you a long letter. Then decide. No experience needed, no capital. Your credit is good if you mean business. But you *must* be ambitious, you must want to *make money*. That's all. Write a postcard *now*. I want to pay you sixty dollars every week.

THE ROBINSON CABINET MFG. CO.
1717 Factories Bldg., Toledo, Ohio Can. Address: Walkerville, Ont.

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A Backbone— not a background for plaster

HERE is a lath that becomes actually imbedded in the mortar or plaster—it practically makes a reinforced wall. It furnishes a strong, rigid base—it makes your work quick, sure, dependable.



saves time, cuts costs. It can be fastened directly to the sheathing boards or studding, and a perfect key is certain. It is self-furring—another saving for you of 4 to 5c per square yard over Metal Laths that require Furring Strips. It keys quickly and perfectly. It is used for stucco work, overcoating and also for interior plastering.

Extra Weight Means Added Strength

The strands of Sykes Expanded Cup Lath are wider, therefore the lath weighs more per square yard when cut from the same gauge sheets than that of other makes. For instance, our No. 27 gauge weighs 2.8 lbs. per square yard, which by comparison you will find much heavier than that of most laths in this gauge. This means extra strength, added durability.

Packed 20 square yards to the bundle. Size of sheets 18x96 inches, in gauges 27, 26, 25 and 24. Furnished with either an Anti-Rust (oil) coating, painted black, or galvanized.

Sykes' Trough Sheet Lath—Undoubtedly the best inside lath made, because of its scientific design and full length corrugations. Ideal for ceilings, inside walls, mantel and tile setting. Furnished either in anti-rust (oil) coating, painted black, or galvanized. Write us for prices and free samples.

Sykes' Wall Ties—Standard, 7 in. long—Sykes' Veneer Wall Ties, 6 in. long; extra heavy galvanized, with crosscorrugation. Free samples.

Sykes' Corner Beads—6, 7, 8, 9 and 10 feet. Ten pieces to the bundle. Free samples.

Write for your copy of Sykes Complete Specifications for Stucco on Metal Lath.

We will send you a copy of our complete specifications—a booklet of vital interest to every man who does stucco work

Sykes Metal Lath & Roofing Co.

502 Walnut Street Niles, Ohio

Put your name on margin below—tear off—Mail



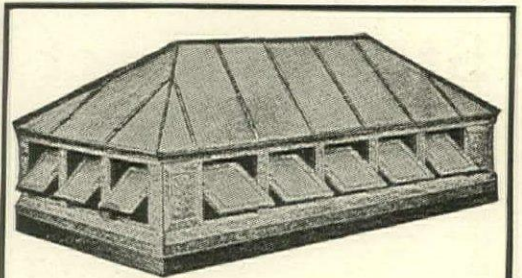
ORNAMENTAL AND ENDURING Mullins' Metal Tile Roofing

is ornamental, as well as weather-defying. With proper care it is everlasting. Its first cost is almost its last cost. It is the one Metal Tile Roofing that is faultless, as all drawbacks from expansion and contraction, have been eliminated. It is simple in construction, and when put on according to directions, is guaranteed for years.

We also manufacture stock and special designs in Cornices, Building Fronts, Garlands, Modillions, Enriched Moldings, Capitals, Finials, Tympanum Panels, Faces and Sheet Metal Statuary. Also Ornamental Metal Stampings for Cornices and Fireproof Windows. Special discounts to the trade.

Write for Catalog

THE W. H. MULLINS CO.
120 Franklin St., Salem, Ohio, U. S. A.



Do You Install Willis Skylights?

If it's for a small residence—or a large factory—a Willis Skylight fills the bill exactly; made in all styles.

Fine for the contractor, too, as any ordinary workman can erect one in an hour or less. A hammer and screwdriver are positively the only tools needed. No putty, solder or experience necessary. Guaranteed watertight, and cannot sag, buckle or spread. Largest possible glass area.

Our big catalog No. 6 is sure to interest you; write for a free copy.

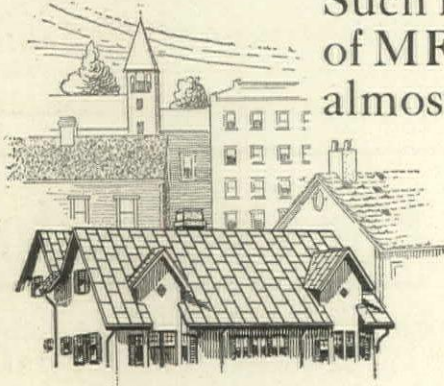
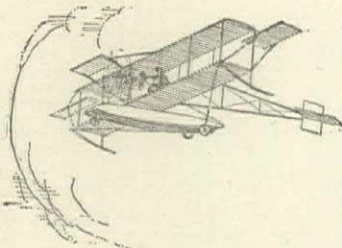
Willis Mfg. Co., Galesburg, Ill.
Manufacturers Fireproof Windows, Ventilators, etc.

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If You Were Up in an Aeroplane



you could see the advantages of a good tin roof. No leaking—no warping—no cracking—no clogging of gutters—and last but not least—*fireproof*. Such has been the record of MF ROOFING TIN for almost a century.



C. B. OPEN HEARTH
32 POUNDS COATING

"The Terne which turns the elements."

All of our Roofing Tin, including MF, is made from high grade Copper Bearing Open Hearth Steel. Every Architect, Roofer and Builder should have our booklet "Copper—Its Effect Upon Steel for Roofing Tin." We also manufacture Apollo Best Bloom Galvanized Sheets, Keystone Copper Bearing Sheets, Formed Roofing Products.

American Sheet and Tin Plate Company

General Offices: Frick Building, Pittsburgh, Pa.

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Mr. Prophett has seventeen of his houses roofed with W & C Metal Shingles

His residence—shown below—was covered 27 years

ago; up to the present minute this roof hasn't cost a cent for repairs or renewals. The other 16 roofs, in service from 8 to 25 years, are equally free from any repair or renewal costs. That isn't so bad, is it? Mr. Prophett has put hundreds of W & C Metal Shingle roofs on in his town and all users are highly satisfied. Incidentally the profits from this work is largely responsible for the ownership of the seventeen houses. There is a chance in your town for a like result. Ask about it.

Walter's and Cooper's Metal Shingles

National Sheet Metal Roofing Co.
339-66 Grand Street, Jersey City, N. J.



Hess Furnaces For Contractors



The Hess Furnace is not offered to dealers, but is offered and sold at a factory rate, direct to consumers, the idea being that in such sales we can plan the heating arrangement and secure greater efficiency, at the same time saving for the purchaser considerable in the price. This plan, which we have followed for years, has been highly successful and satisfactory. Much of this business is done through **contractors** who co-operate with us by sending sketches of the buildings to be heated, and following out our plans for heating, which we supply without charge.

The equipments we furnish, which include pipes, registers and every other detail, are made according to our plans, and are installed by the owners or contractors.

We make a **special profit-sharing allowance to contractors**, which makes our plan particularly attractive to them. In any case, dealing with owner or contractor, we fully guarantee the success of the equipment, allowing the money to be withheld during two months of winter weather **until the heater is tested**. If you are a contractor, or if you are building a home for yourself, let us tell you how we can save you some heater money, and insure comfort in the house you are building.

Hess Warming & Ventilating Co., 907 Tacoma Bldg., Chicago, Ill.
WHITE STEEL MEDICINE CABINETS, ALSO

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*J-M Asbestos
Stucco used on
H. B. Anderson's
Residence,
Saginaw, Mich.
B. F. Boerger,
Architect*

Neither Age Nor Weather Can Mar Its Beauty

Here is a NO-SAND stucco that is not affected by the test of time. It contains no vegetable matter. And it is fireproof. J-M Asbestos Stucco is composed of tough asbestos fibre, pulverized asbestos rock and Portland cement—all materials which insure permanence of artistic finish and internal solidity.

J-M Asbestos Stucco

differs from sand stucco in that it does not contain loam and salts which tend to cause discoloration and injure the strength and durability of the stucco. Its felt-like character, due to the asbestos fibres, reduces the possibility of cracking to a minimum.

Goes farther because it contains more material to the pound. Furnished also in prepared form; white, gray (different shades), buff and brown. *Write for booklet and sample.*

H. W. JOHNS - MANVILLE CO.

Atlanta	Denver	Memphis	Philadelphia
Baltimore	Detroit	Milwaukee	Pittsburgh
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Buffalo	Indianapolis	Newark	St. Louis
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Cincinnati	Los Angeles	New York	San Francisco
Cleveland	Louisville	Omaha	Seattle
Columbus			Toledo

(2409A)



Con-ser-tex solves all roofing problems

What is Con-ser-tex? It is a canvass roofing, chemically treated to preserve the fibre from the mildew and the detrimental action of the oil in paint.

What Are Its Uses? It is used for Porch and House roofs, piazza floors, sleeping balconies, bathroom walls and floors, kitchen floors and all other places where a serviceable fabric is required.

Does It Do the Work? It never rots or stretches. It hugs the porch or roof surface tightly. Neat and artistic appearance. It deadens sound, is water proof and weather proof. Defies treading, coal gas, or any other wearing influence.

Does It Cost Much? Con-ser-tex is very inexpensive. Cheaper than most other roofing materials. It is easy to put on—thus saving time and eliminating trouble for the carpenter.

Anything Else? Yes, we will send you a sample of this wonderful fabric. A moment's investigation will show you its superiority over Cotton Duck and other roofing fabrics. We will also send you descriptive folder and price list.

Wm. L. Barrell Company 8 Thomas Street, New York City

Chicago Distributor: Geo. B. Carpenter & Co., 430-40 Wells St.
California Distributors:
Waterhouse & Price Co., Los Angeles
The Pacific Building Material Co., San Francisco



If You Build, Buy, Own

Be up-to-date
and have the
world's best—

The Window Chute for your coal bin.



Thousands
in use—
The very
Best.

Write for Booklet "C."

Holland Furnace Co., Holland, Mich.
World's Largest Direct Installers of Furnaces.

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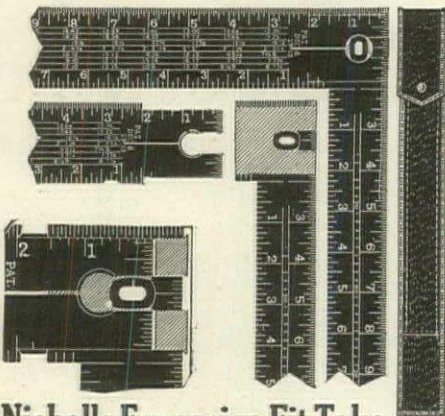
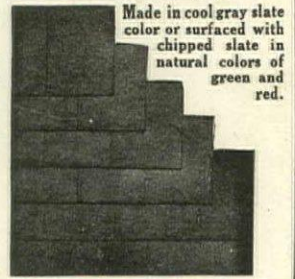
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The Winthrop TAPERED Asphalt Shingles

Winthrop Asphalt Shingles have all the durability of asphalt and the light weight of shingles. They're **fire resisting**—weather proof—wind and sun proof and never break or blow off. Fully guaranteed. Write for agents' proposition. Specify and buy them for every job.

The Winthrop Asphalt Shingle Co.

Factory: 102 61st St., Argo, Ill. Office: 1415 Association Bldg., Chicago



Nicholls Expansion Fit Take Down Square No. 500R

Eccentric Cam expands end of body in milled portion of tongue, making an absolutely solid joint, also taking up wear. Long bearings assure accuracy.

Strength where tongue joins on to body. All other Take Down Squares are cut half into at this point.

These are stamped with our RAFTER FRAMING RULE, giving lengths and cuts of all rafters for seventeen different pitches of roof.

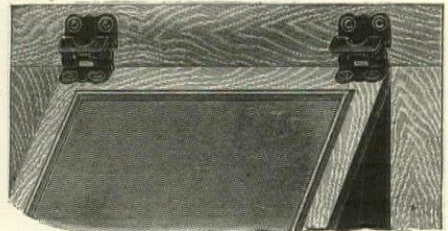
Send for our LITTLE BOOK on Rafter Framing. It is FREE.

Nicholls Mfg. Co., Ottumwa, Iowa

WRITE FOR FREE SAMPLE

WATROUS

Safety Screen or Storm Sash Hanger



And see why it will give better satisfaction and service to your customers. Its simplicity of construction makes it easy to hang.

Costs Less — Lasts Longer Gives Better Service

No screws used. Barbed car nails make it easy to hang and save time.

Sold by All Dealers

Watrous-Acme Mfg. Co.
Des Moines, Iowa

Chicago Sales Office: 180 No. Dearborn St.



Beauty and Utility Go Together with Reynolds Asphalt Shingles

Light in weight, will outlast the guarantee. Economical in first cost and eliminate maintenance cost. The most artistic roofing material made, and gives the most protection against the elements. Unaffected by extreme heat or cold. Fire resisting—approved by National Board of Underwriters. Simply cannot warp, crack, split or curl. Look better and last longer than wood shingles, yet cost no more than No. 1 wood shingles. No builder or building owner should fail to get full particulars; interesting booklet sent on request.

H. M. Reynolds Asphalt Shingle Co.

Established 1868

637 Grant Street, West - Grand Rapids, Mich.

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“now I know Flex-A-Tile Roofing is Best”

Read what this buyer of carload lots says about Heppes roofing:

“I live and do business in Wisconsin. Some time ago I ordered a carload of roofing from the Heppes Company. On inspection I thought the roofing was too stiff and hard. I complained about this to one of their salesmen. He suggested that I go down to Chicago and see just how this roofing is built.

“Well, I went—and now I know that stiff roofing is in every way better than softer, more pliable kinds. Here’s what I saw:

“I saw that it requires big machines, big brains and a vast deal of ‘Honest Abe’ labor and effort to take this pure, hard asphalt mined from the heart of the Rockies, combine it with the long strands of wool felt and produce this stiff solid roofing. I learned that it would be much easier to mix oil with the asphalt and to make a more pliable, less durable roofing. I learned that it is the hard asphalt that makes Flex-A-Tile so tough and durable. Softer roofing to some extent, melts and decomposes in the sun. This dura-

bility was brought home to me strongest when I saw that it is almost impossible to tear the heavy 5-ply Rubbertex Roofing Heppes makes, while it is easy to tear the softer, thinner kinds. It would be easy to turn out a more pliable roofing by adding oil to the asphalt. And it would be a whole lot cheaper too—oil costs about one-fifth as much as asphalt.

“I saw the long stretches of wool felt taking a saturation of twice their own weight of this oil-free asphalt. They have to heat the big kettles up to 390° Fahrenheit before this asphalt melts. I understand that no other roofing maker uses this process.

“Then I saw heaps of Vermont slate in beautiful shades of green and red and brown. I saw great quantities of this slate sifted three times and then crushed by giant rollers under tons of pressure into both sides of the rubbery sheets.

“—and so now I *know* that Flex-A-Tile Roofing is ‘Honest Abe’ and *right*.”

Hundreds of carpenters, builders and household owners the country over know that Flex-A-Tile Roofing is *right*. Let us convince you. Write *today* for a specimen of Giant Flex-A-Tile. You assume no obligation.

THE HEPPEES CO.

1012 So. Kilbourne Ave.

CHICAGO, ILL.

Manufacturers Also of Asphalt Paint, Asphalt Roofing in Any Finish and Utility Wall Board

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Why Not Specialize, Mr. Contractor

In a line that is not only profitable, but will quickly give you a reputation and prestige that otherwise would require years of hard work?

We need the co-operation of one ambitious, conscientious man in every city, town and village to install our store fronts.

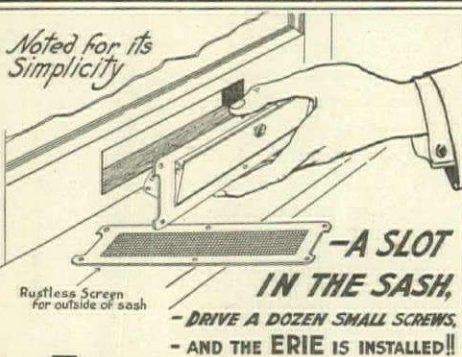
Our direct-to-the-store owner advertising is bringing orders from every section; the only way we can fill them promptly is by referring orders to local carpenters and builders.

This business can be handled when other work is slack. If you are open for a real proposition, write today, as we shall close with only one man in each town.

J. W. Coulson & Co., 95 West Spring Street, Columbus, Ohio



*Noted for its
Simplicity*



Rustless Screen
for outside of sash

**-A SLOT
IN THE SASH,**

**- DRIVE A DOZEN SMALL SCREWS,
- AND THE ERIE IS INSTALLED!!**

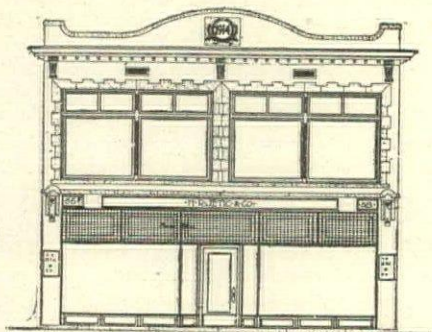
The ERIE SASH VENTILATOR

is a good proposition, because it is economical, attractive. Easy to install and operate. So simple in construction it can't get out of order or rattle.

Inside sash plate and shutter made of sheet brass; outside vent made of sheet brass and rustless wire screen. Finished to match any conventional hardware.

Write for particulars.

Erie Ventilator & Mfg. Co.
649 West 12th St. - Erie, Penna.



WHEN YOU DESIGN A STORE FRONT LIKE THIS

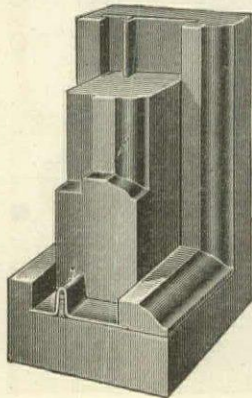
Why don't you just specify "Petz Patent Store Front Construction including ventilated sash shall be used?"

You can leave it to us to provide a modern, sales-getting front — and a front which will get the lowest insurance rate for the plate glass.

Those are the bulls'-eyes for your client's satisfaction.

Send for catalog and put the store front up to us.

Detroit Show Case Co., 481 W. Fort St., Detroit, Mich.



Get In Business For Yourself

Make big money. Be independent.

Niagara Metal Weather Strip

(THE WOOD REINFORCED)

☐ Is the easiest sold weather strip on the market—Because: It is the strongest and gives greatest protection. ☐ The meeting-rail strips are double nailed. ☐ The spring bronze is extra heavy gauge and straight. ☐ The All Brass Threshold has conquered the door bottom problem. ☐ If you mean business write for prices and literature.

Niagara Metal Weather Strip Co., 737 Main St., Buffalo, New York

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Machine Bit

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 late tools combined, for all kinds of delicate work. Cabinet and pattern makers and carpenters are enthusiastic because they do more work than other bits and cost no more.

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

THE PROGRESSIVE MFG. CO.
TORRINGTON, CONN.

Brace Bit

SWAN



Good Tools Make Work a Pleasure

☞ Good woodworking tools save more time, enable better work and will last considerably longer than tools made to sell simply on a low price basis. The carpenter who uses inferior tools is working under a big handicap.

☞ By good tools we mean SWAN tools, which embody the high quality developed by over one hundred years' manufacturing experience.

Write for free complete catalog
The James Swan Co.
Est. 1810 Seymour, Conn.



At Least 75c For Every National Builder Reader :::::

“VANADIUM”

The King of Hand Saws

20"	22"	24"	26"	28"	30"
\$2.00	\$2.15	\$2.30	\$2.50	\$2.70	\$2.90

Straight or Skew Back, in Hand, Panel or Rip—any Teeth Desired. All Styles. Vanadium Steel Saws made of Vanadium High Speed Steel, hardened and tempered by a secret process. If the Vanadium Steel Saw does not give better service than any other saw you have ever had, return it and your money will be refunded.

VANADIUM STEEL SAWS

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OUR PROPOSITION

In order to get at least one Pennsylvania Vanadium saw into the hands of every National Builder tool user we offer a reduction of 75c cash from prices shown herewith on every saw ordered on coupon attached—and it will come prepaid too.

Send In For Your Trial Saw

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Manufacturers of Saws, Scrapers, Try Squares, Etc.

Pennsylvania Saw Co., Frackville, Penna.

Gentlemen:-

I enclose \$..... for a trial ^{saw} Length.....
saws..... inches. Teeth.....pts. Narrow or
Wide Blade..... Straight or Skew Back.....
prepaid. I am a National Builder reader.

Name.....

Address.....

Name of Dealer.....

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Only Water Tight Flashing

☞ The most practical Flashing ever devised; does away with the old many piece tin shingle method.
 ☞ This Flashing covered by Patent No. 1,082,602. Patent is for sale. Parties interested should communicate at once with

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NO
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**AUTOMATIC
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 and save labor, lumber and money. Send for trial set (\$1 prepaid) stating approximate weight of sash, or our circular.
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This authorizes any dealer to sell you a Self-Setting Plane on trial and refund your money if you return the plane within 60 days from now. FREE—\$1.00 certificate and carpenter's pencil if you say N. B.; another pencil for 10 addresses of carpenters. See our ad in December and January National Builder.

Gage Tool Co., - - Vineland, New Jersey
 For sale by Orr & Lockett, Chicago; Hammacher & Schlemmer, N. Y.



THE WORCESTER BLOUNT
DOOR CHECK
 STANDS FOR QUALITY
WORCESTER MFG. Co.
 Worcester, Mass.

CHELSEA

EXEMPLAR OF QUALITY
 Send for Dumbwaiter-Elevator Catalog
Chelsea Elevator Co., 334 W. 26th St., N. Y. City

PHOENIX INSIDE SLIDING BLINDS

Comfort : Convenience : Economy
 The lately patented springs and corrugated steel rods put the "Phoenix" far in lead of less improved styles.
 WRITE FOR CATALOG P-T.
Phoenix Sliding Blind Co., PHOENIX, N. Y.

The Zimmerman Iron Base

is the ONLY BASE having a CENTER BEARING.
 It carries the required weight without allowing the corner supports to sink into the floor and prevents the base of column and floor from rotting.
S. Cheney & Son, Manlius, N. Y.

Bottom View Showing Center Bearing

JOHNSTON'S Patent SHELF PIN

1 DOZ. 15¢
 1 GROSS 85¢
 These Pins are used for supporting movable shelves in Book Cases. Cannot fall out or sag down. The best shelf pin made. Easily put in place by any one.
 Send for free sample to **J.D. JOHNSTON, NEWPORT, R. I.**

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Diamond Expansion Bolts

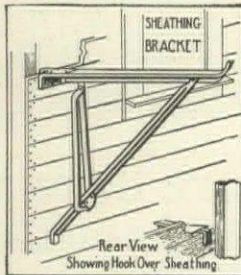
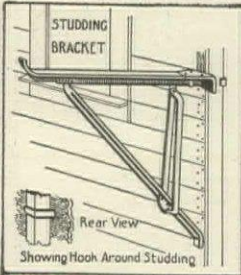
For fastening all kinds of material to brick, stone or concrete—

**Quickly
Securely
Positively**



“They Hold as Long as the Wall Lasts.”

Diamond Expansion Bolt Co.
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Save \$50

It is an actual fact that one dozen of the Detroit Brackets will save you from \$30.00 to \$50.00 on every house you build, in labor, time, and lumber. You can put up your scaffolding in an hour's time where it would ordinarily take you very nearly a day.

Up-to-date contractors see the advantages of Scaffold Brackets and are reaping the benefit at the expense of the less enterprising.

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- No. 2—4 ft. Sheathing Bracket..... 18.00 per doz.
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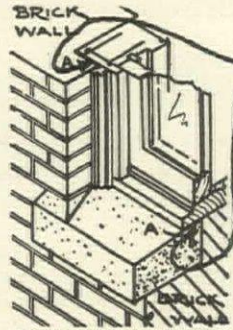
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If these brackets are not entirely satisfactory in every way we will refund your money as cheerfully as we have received it.

Remember you will have safer and far more reliable scaffolding and can use the brackets for years to come.

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You Can Save Money



If you will only Caulk your Windows.

McCoy's Elastic Cement

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Our circular will interest you and give you the reasons why you should caulk your windows. It will be sent gladly, together with sample, for the asking.

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Design No. 524 by Jud Yoho estimated cost \$2,800.00

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NO doubt you've been successful in this very desirable class of construction work, but in every case where we have co-operated with a contractor we have helped him to make **more** money than he would have made without us.

The point is here: **We are barn specialists.** We do nothing but design and equip dairy barns, and, being practical dairy people, we know what the barn owner needs and what will make him a satisfied customer.

James Barn Plan Service

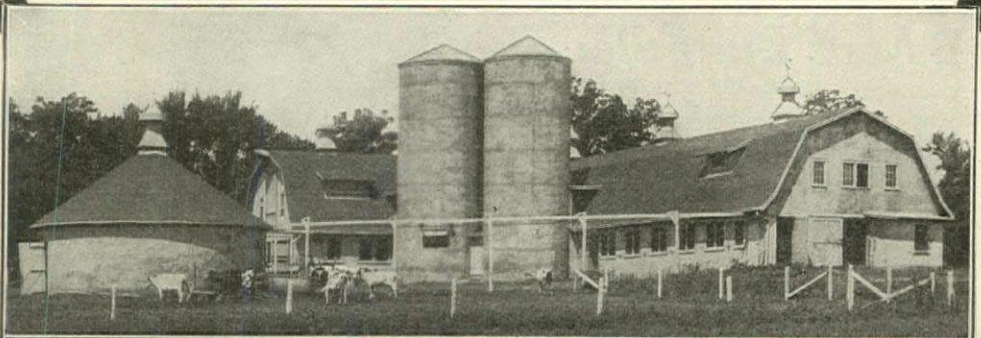
is for contractors and builders who appreciate the assistance of barn experts. We work with you. Together we can create a lot of new barn building business in your neighborhood. The movement for better barns is sweeping the country and no other line of agriculture is flourishing like the dairy business. Let's work together.

Write for This Helpful Book—It's FREE

"Building the Dairy Barn" will be sent you if you will send us a list of people who expect to build or remodel barns—when they expect to build, and for how many cows. Also ask about our special offer of complete working blue prints.

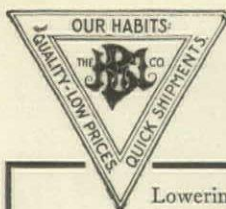
JAMES MFG. CO., C. F. 102 Cane St., Fort Atkinson, Wis.

"Originators of Sanitary Barn Equipment Ideas"



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Huberize-- and Increase Your Profits

Lowering your cost means raising your profits; and you can do it. We do nothing but sell *good* building material to building owners and contractors at *factory prices*. Our plan enables you to get the *highest quality* goods for far below the usual cost of inferior products. This is possible because we are National

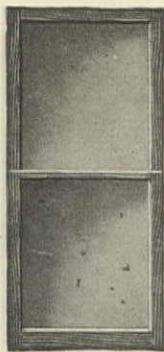
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Fireplaces, Doors, Windows, Ready Roofing, Flooring, Mouldings, Columns, Porch and Stair Newels, Grilles, Colonnades--everything, in fact, used in building construction.

That "Huberizing means Economizing" is proven by our two big catalogs--one on millwork, the other on mantels. These explain how we can sell so cheap and make immediate shipments.

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The Huber Builders Material Co.
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Red Devil Bonded chisels, gouges, drawing knives

are attested for their superiority by
many discriminating users

☞ BONDED "RED DEVIL" Chisels are the best that expert craftsmen can produce. The steel is the highest grade obtainable for the purpose. The handles are select second growth hickory, well seasoned, and made to fit the tool.

☞ Each chisel is ground sharp, hand honed and set. Packed one in a box protecting the edge, ready for instant use.

☞ With each tool is packed a "Bond," insuring absolute satisfaction and perfection for 2 years.

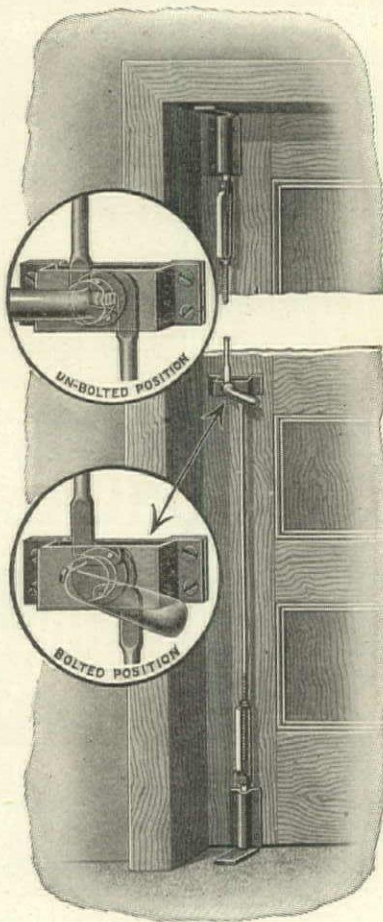
☞ This is the ONLY chisel that carries an insurance policy.

☞ You can obtain RED DEVIL tools from your dealer. If not, we will send one sample of RED DEVIL Bonded No. 2622 1" beveled socket firmer chisel with leather tipped handle for 50c.

☞ Send for booklet of 3,000 RED DEVILS and copy of BOND anyhow.

SMITH & HEMENWAY CO., Inc.
160 Chambers St., New York, N. Y.

DOUBLE LOCKED



No. 517

R-W Top and Bottom Bolt for Garage Doors

Locks doors at both top and bottom with one movement of lever handle.

So constructed that when bolted or unbolted the ends of connecting rods, where attached to the lever handle, are off center so that bolt maintains its position by gravity and cannot be changed except by moving the lever handle.

Made in two sizes and adjustable for doors of various heights. No. 1 for doors from 7 to 8 ft. high. No. 2 for doors 8 to 9 ft. high. Furnished for other height doors if required. Adjustment is positive and is securely locked. Suitable for use on inside of building.

Write us--find out about R-W Locks and Latches

Richards-Wilcox



MANUFACTURING Co.
AURORA, ILL. U.S.A.



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Hundreds of carpenters all over the country are building bungalows from our plans and making big money. Get the latest designs and ideas of the world's best bungalow architects and profit by their experience. Each issue of BUNGALOW MAGAZINE contains one complete set of working plans, drawn to the same scale as a regular architect's blue print, of an attractive bungalow with plenty of illustrations of same and a comprehensive bill of material as well as illustrating from six to fifteen other beautiful bungalow homes.

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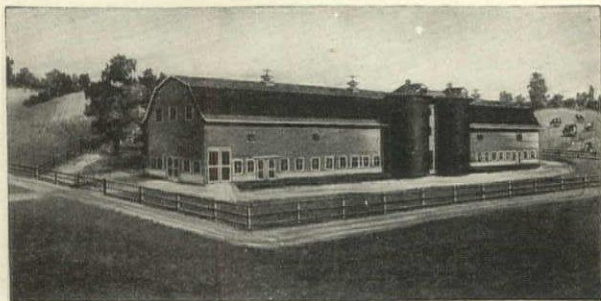
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Porter Perfect Barn Equipment

THE WORLD'S STANDARD LINE



The farmers demand the best in barn construction and have the money to pay for it.




Thousands of modern barns will be built, or old ones remodeled, this fall and next spring. We can help you get your share of this profitable business and you can help us.

For nearly fifty years we have specialized in barn building equipment. Our entire draft-

ing department we will gladly place at your service, furnish blue prints upon receipt of sketches for any barn you plan to build or remodel, with estimate of cost, and give you valuable suggestions on the latest barn construction, free.

Simply send us the names of prospective barn builders you know, and ask for our Catalog No. 60 of Perfect Barn Equipment. We will show you where the profit comes in.

J. E. Porter Company - Ottawa, Illinois

GAS For Lighting and Cooking

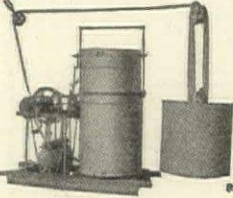
Is wanted by every home and store owner where there is no central gas plant. Our individual Gas Plant fills every requirement economically.

Make Money In Winter


While your regular stock is slack by selling and installing our Gas Plants; this work is easy, interesting and profitable. To the right man we are ready to offer a splendid opportunity, which will not conflict with regular work.

Unlimited Opportunity

Surrounds you on every side and with our co-operation in selling you can put in a most profitable winter. This is a proposition worthy of your immediate and careful consideration, but in order that we may place it before you, we must have your name and address, so write us at once for particulars.



Whitacre - Goshert
Mfg. Co.
Rockford - Illinois



SUNRAY



Free to Contractors and Builders

Plans and Specifications for Installing Sunray Acetylene Lighting Systems

We want to work with you, Mr. Contractor and Builder. We have an absolutely safe, very economical and easily installed lighting system which will make money for you whenever specified or put in. Our special offer—"Free plans and specifications"—is worth knowing about.

Write us for it today and make an additional profit from the owner of every home, hotel, hall, barn, etc., who wants the finest system for lighting or cooking.

Sunray Generator Co.,
233 West Main St. Ottumwa, Iowa

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Opportunity Is Calling to You

Will You Heed the Call, *Right Now?*

You may feel that Dame Fortune has failed to ring your door bell, or that if she tried to ring, the wires were crossed—that your *big chance to make good* in a *big way* has never come.

Opportunity comes not once, but many times. *The big opportunity* is now face to face with you, looking you square in the eye, and holding out to you the *one big chance* of a lifetime to become prosperous in a field that is not overcrowded—in fact a chance to get out of the crowd and become a *big fish in a small pond*.

We want to tell you all about the successes of those who have grasped the *big chance*. What these men have done, *you* can do. Read the balance of this page and write us immediately. Don't let someone beat you to this.

Be "The Polk System" Man Of Your Community

Wherever there is a barn there is a need for one or more *Polk System* silos. The *Polk System* is so far ahead of any other method of silo construction that one silo in a community will always sell more. This is a common experience among contractors already engaged in the work.

Building Good Concrete Silos Is Profitable

There is a growing demand for *good silos* from every part of the country. *You* are the man to supply the demand of farmers in your vicinity. But you must *show* them that the silos you are prepared to build are *good*.

Flimsily constructed silos are *not* profitable to your customers or yourself. Equip yourself to build silos that will last "for all time"—that fire or storm cannot affect.

The Efficient Silo

The *Polk System* has made possible the erection of monolithic concrete silos four or five diameters in height—the truly economical and efficient proportion. *Polk System* silos are always perpendicular and perfectly circular. The walls are of uniform thickness.

The POLK SYSTEM Machine

makes *Polk System* silos possible, and saves 40% in the usual costs of monolithic concrete construction. Because of this you can give the farmer a better silo at lower cost than ordinarily, besides making a larger profit for yourself.

No Obligation If You Investigate

—so write us a post card for literature and details *at once*. Remember that it is easier to build silos than it is to build houses—and far more profitable.

Polk-Genung-Polk Co.
Fort Branch - Indiana



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The National Builder

Published Monthly at 537 South Dearborn Street, Chicago, Ill., by The Porter-Hodgson Company

Fred D. Porter.....President and Treasurer
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 B. E. Mitler.....203 Broadway, New York. Eastern Manager

EDITORIAL

Fred T. Hodgson.....Editor
 Charles A. Miller, Jr.....Managing Editor

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 Consolidated 1896.

Member Chicago Trade Press Association

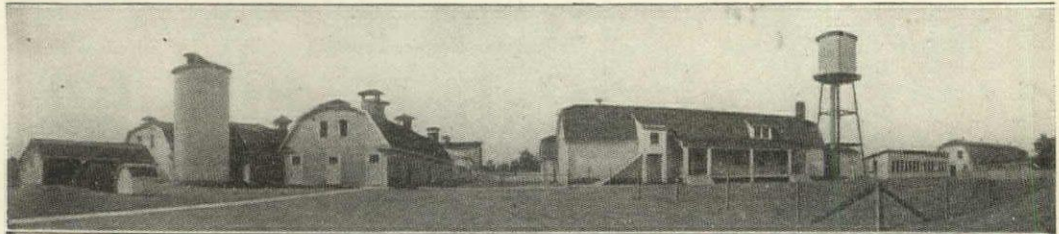
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 Act of March 3, 1879.

SUBSCRIPTION RATES.

Domestic, \$1.50 per year; Canadian, \$2.00; Foreign, \$2.50 per year.



Copyright, 1914, by the Porter-Hodgson Co.



(Louden-Planned Barns at Moline, Illinois)

Get Into the Barn Business

While city folks are worrying about the high cost of living, the farmer is smiling over the high price of farm products, and telling Mary that "We'll build that new barn, now."

What Are You Doing?

The Louden national advertising campaign is interesting thousands of farmers in new barns, modern barns—LOUDEN BARNs.

GET BUSY BUILDING BARNs!

We've been specializing on barns for nearly half a century, and never before has there been such an opportunity for the carpenter of the small town as there is right now.

Write and ask us how to get into this money-making field. Let us help convince your farmer friend that what he needs is a modern barn—a money-making barn—a barn that will be a constant pride as well as economy. As for you—

Build a modern barn under Louden guidance and you will build a monument that will stand as a LIVE, FORCEFUL advertisement of your ability as a builder.

Fill in the attached coupon with names of farmers you think will build or SHOULD build, and we'll start things MOVING.

Steel Stalls, Litter and Feed Carriers, Barn Door Hangers and Hay Tools.....

LOUDEN MACHINERY CO.

(Established 1867)

5601 Fourth Street Fairfield, Iowa

Louden Machinery Co.,
5601 Fourth St., Fairfield, Ia.

Please give me full information regarding your Barn Building Proposition.

I believe the following named persons are prospective barn builders:

Mr.
P.O. State

Mr.
P.O. State

Mr.
P.O. State

Mr.
P.O. State

Mr.
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Signed
P.O. State

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This Bolt



has the best grip known

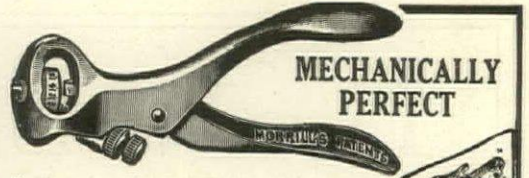
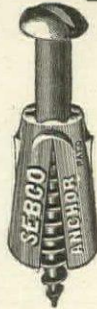
When inserted in stone, brick, tile or any hard substance, the patent shield surrounding the bolt expands, solidly embedding itself in the material and practically becomes part of the wall, ceiling or floor.

SEBCO EXPANSION BOLTS

The shield may be used with machine bolts or lag screws of any size from No. 5 to No. 10 and will firmly hold the heaviest fixtures. Nothing is simpler in operation nor more dependable in use.

Send for Samples and Catalog Carried by Dealers Everywhere

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MECHANICALLY PERFECT

The Morrill Saw Set will accurately set any hand saw. Take out the wrong set and put in the right set in one operation.

Free Our booklet "Saw Points" tells how to properly joint, set and file hand saws.

CHAS. MORRILL

96 LAFAYETTE ST., NEW YORK



Samson Spot Sash Cord



Made of extra quality stock, carefully inspected and guaranteed free from the imperfections which destroy common cords so quickly.

We also make cords for other purposes, including Samson Solid Braided Masons' Lines, Chalk Lines, etc. Samples and full information gladly sent.



Samson Cordage Works - - Boston, Mass.



Residence of Walter M. Collins, Builder, Bayside, lined with Cabot's Quilt, and what the owner says:

"The side walls are of 24-in. red cedar shingles, stained with your Special Gray and laid over your single ply "Quilt." The Quilt is certainly a good investment, as the house is in a very exposed position, and after the hardest winter in years, without a frozen pipe or any difficulty in heating, I feel that the small additional cost over ordinary building paper has already been saved in coal and comfort."

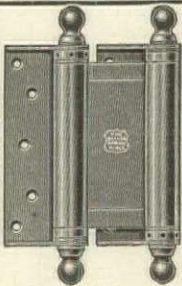
Make Your Houses Frost-Proof by Lining Them with

Cabot's "Quilt"

It is cheaper to build warm houses than to heat cold ones. A cold house will waste enough coal in two winters to pay for enough Quilt to make it warm for all time. Quilt is not a mere building paper, but a thick matted lining of cured cel-grass that is *twenty-eight times warmer than common paper*. It will make your house warm in winter and cool in summer, cut down your doctor's bills and keep the whole family comfortable. It costs only 1c a foot, will never rot or disintegrate—last forever—and is fire retarding. A full investigation will cost you a postal card—which will bring you a sample and the proofs. Will you write now?

SAMUEL CABOT, Inc., Mfg. Chemists, Boston, Mass.

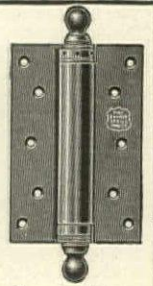
Cabot's Creosote Shingle Stains



Only the New Double Action

BOMMER

SPRING HINGES



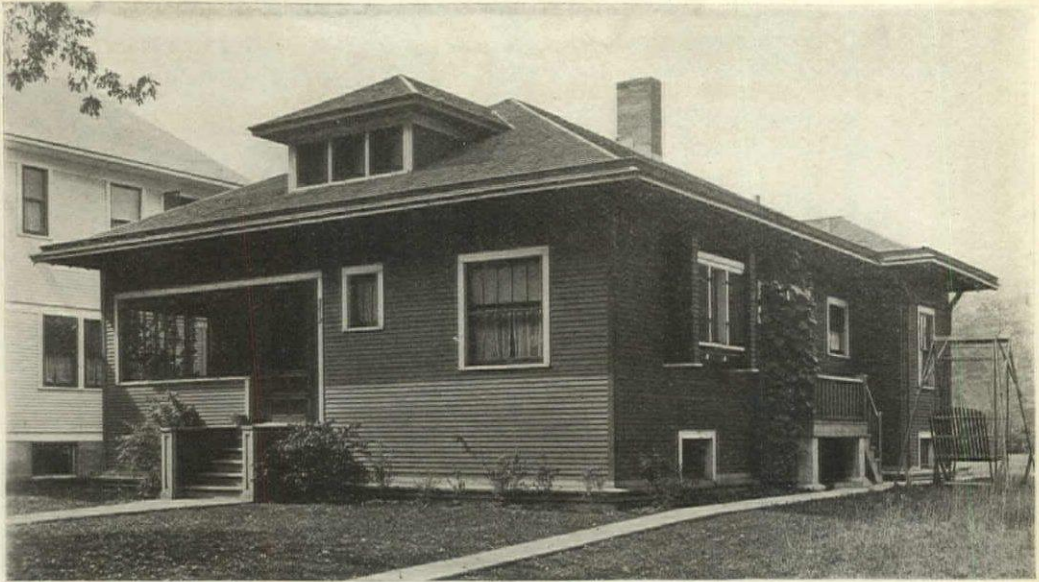
Have the weight-supporting bearings correctly located to liberate the action of the springs, reducing breakage and increasing spring power.

Carpenters can scribe and fit both doors of a pair from same side of opening.

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Bungalow of Mr. H. E. Young, Norwood Park, Ill.

NATIONAL BUILDER DESIGN No. 388.

Emil Hoffman, Architect.

For Floor Plans, Sections, Details and Full Working Drawings, see Supplement of this month. Estimated cost, \$3290.17.*

Estimate of Norwood Bungalow

I. P. Hicks

EXCAVATING AND MASONRY

280 yards excavating, 35c.....	\$ 98.00
1200 cu. ft. concrete foundation, wall, 25c	300.00
40 square feet cistern bottom, 20c..	8.00
890 square feet cement cellar floor at 10c	89.00
Outside plastering of foundation wall	7.50
Cementing cistern.....	15.00
27 lineal feet double flue chimney, \$2.00	54.00
Total excavating and masonry..	\$571.50

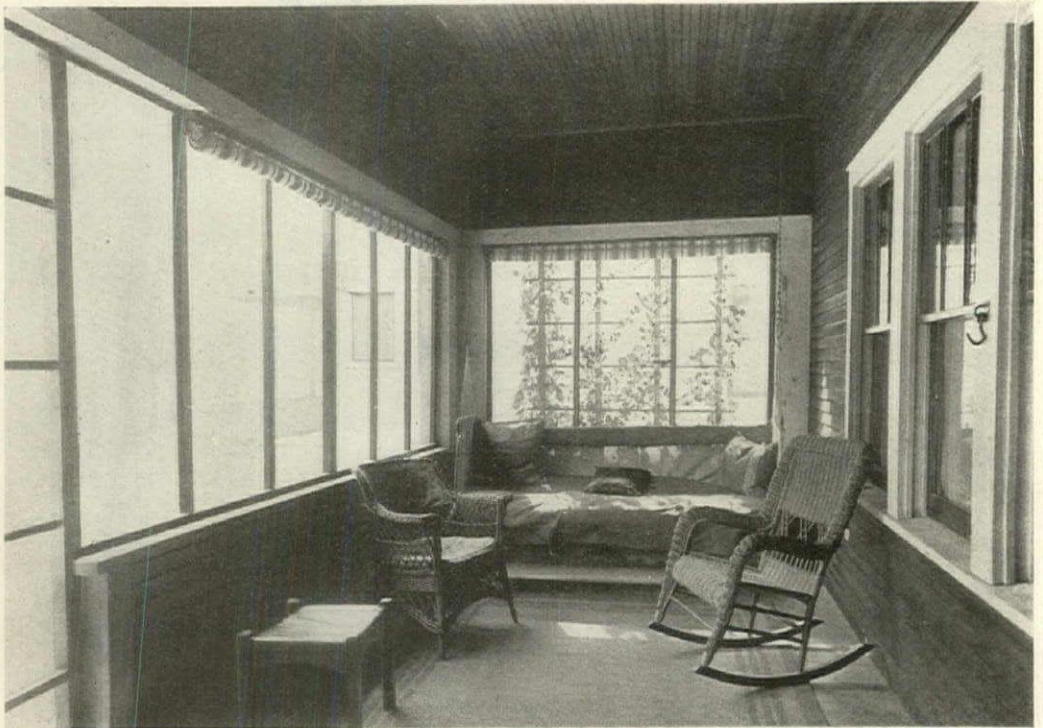
LUMBER BILL

Feet

3 8x 8x22 ft. girders	351
1 8x 8x18 ft. girder	85
8 6x 8x 7 ft. posts	224
17 2x10x12 ft. first floor joists ...	340
8 2x10x10 ft. first floor joists ...	132

10 2x10x14 ft. first floor joists ...	230
20 2x10x18 ft. first floor joists ...	600
20 2x10x14 ft. first floor joists ...	460
10 2x 8x18 ft. porch joists	240
20 2x 8x14 ft. second floor joists..	380
22 2x 8x18 ft. second floor joists..	528
20 2x 8x16 ft. second floor joists..	420
10 2x 8x12 ft. second floor joists..	160
8 2x 8x12 ft. over porch	128
4 2x 8x16 ft. side porch	84
12 2x 8x16 ft. sill plates	252
140 2x 4x12 ft. outside studs	1,120
20 2x 4x16 ft. for dormers	220
90 2x 4x18 ft. for partitions	1,080
32 2x 4x16 ft. for plates	385
26 2x 4x12 ft. for plates	208
40 2x 6x12 ft. for lookouts	480
10 2x 4x22 ft. for rafters	150
4 2x 6x28 ft. for hip rafters	112
18 2x 4x20 ft. for rafters	234
50 2x 4x18 ft. for rafters	600
12 2x 6x10 ft. for partition	120

* Materials are figured at Omaha prices. Carpenter labor figured at 50 cents per hour.



The Screened Porch is Enclosed in Winter for a Play Room.

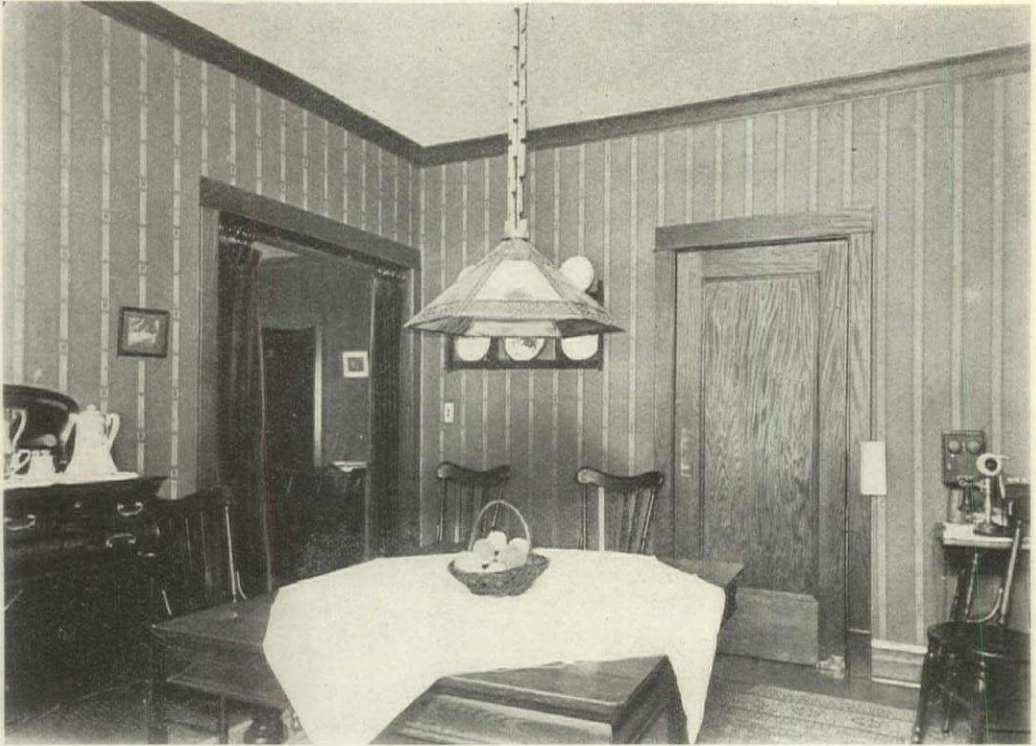
40 1x 6x12 ft. for braces	240
30 1x 4x12 ft. for bridging and backing	120
10 1x 6x16 ft. for ribbon boards..	80
10 2x 4x16 ft. for dining room bay	110
10 2x10x12 ft. cellar steps	200
<hr/>	
Total feet framing lumber.....	10,040
10,040 feet framing lumber at \$26.	\$261.04
2,320 ft. 8 inch No. 2 lap outside sheathing, \$25.....	58.00
1,270 ft. 8 inch No. 2 lap for rough floor, \$25	31.75
1,500 ft. 1x2 1/4 face clear flg., \$40.	60.00
2,100 ft. No. 2 6-inch sheathing, \$25	52.50
20 M. shingles, \$4	80.00
2,600 ft. 1/2x4 inch siding, \$30....	78.00
220 ft. 1x4x9 ft. flg. porch, \$40.	8.80
220 ft. 5/8x4x8 ft. ceiling, porch, \$28	6.16
750 ft. 5/8x4x12 to 16 ft. ceiling for cornice, \$28.....	21.00
5 rolls R. R. building paper, 70c	3.50
12 1 x 4x16 ft. finish, \$40...	2.50

15 1 x 4x12 ft. finish, \$40...	2.40
10 2 x10x16 ft. finish, \$45...	10.80
14 1 x 8x16 ft. finish, \$40...	6.16
15 1 x 2x16 ft. finish, \$40...	1.60
4 1 1/8x12x12 ft. finish, \$45...	2.70
60 ft. 1x6x10 feet flg. outside cellar doors, \$45.....	2.70
650 Star flg. for a 12 ft. strip through center of attic. \$25.	16.25

Total lumber bill.....\$705.92

MILL WORK

5 cellar window frames, 8x18, 4 lt., \$1.75	\$ 8.75
5 cellar sash, 5x18, 4 lt., \$1.40..	7.00
1 cellar door frame, 3' 0"x6' 4" .	2.25
1 cellar door, 3' 0"x6' 4"x1 3/4" ..	4.50
4 porch newels, 5x5x4 ft., 60c....	2.40
14 ft. botton porch rail, 6c.....	.84
14 ft. top porch sail, 6c.....	.84
42 bolsters, 1 3/4x1 3/4x2 ft., 4c....	1.68
80 ft. 7/8 cove mold, 40c.....	.32
80 ft. 7/8 quarter round, 40c.....	.32
350 ft. 2-inch bed mold, 1c.....	3.50
1 front door frame, 3' 0"x6' 8" rab, 1 3/4 inch	3.00



The Dining Room.



The Living Room.



A Cozy Attic Lined with Wall Board.

1 side door frame, 2' 10"x6' 8", rab, 1 3/4 inch	2.75	1 set door jambs, 2' 6"x6' 8"	.75
5 window frames, 32x24, \$2.25..	11.15	2 set door jambs, 2' 2"x6' 8", 70c	1.40
1 window frame, 32x18.....	2.00	1 set door jambs, 4' 10"x6' 8"	1.00
2 window frames, 48x24, \$2.35..	4.70	1 front door, 3' 0"x6' 8"x1 3/4"	16.00
1 window frame, 26x18	2.00	1 side door, 2' 10"x6' 8"x1 3/4"	14.00
1 triple frame, 26x24.....	6.75	1 vestibule door, 3' 0"x6' 8"x 1 3/4"	14.00
1 sash frame, 28x22	1.75	3 doors, 2' 10"x6' 8"x1 3/4", \$7..	21.00
1 sash frame, 20x24	1.75	4 doors, 2' 8"x6' 8"x1 3/8", \$5..	20.00
1 triple sash frame, 14x30.....	4.50	1 door, 2' 2"x6' 8"x1 3/8"	4.50
2 mullion frames, 6 sash, 10x20 for dormers, \$7.50.....	15.00	50 plinth blocks, 6c	3.00
5 windows, 32x24, divided, \$2.40.	12.00	170 ft. 10 ft. casing, windows, 2 1/2c	4.25
1 window, 32x18, divided	2.00	384 ft. 12 ft. casing, doors, 2 1/2c..	9.60
2 windows, 48x24, divided, \$3.00.	6.00	200 ft. 12 ft. head casing, 2 1/2c....	5.00
1 window, 26x18, divided	2.00	72 ft. window stool, 2 1/2c.....	1.80
3 windows, 26x24 divided, \$2.40.	7.20	72 ft. apron, 2c.....	1.44
1 sash, 28x22	1.80	200 ft. fillet, 1/2c	1.00
1 sash, 20x24	1.60	252 ft. door stop, 14 ft. length, 1c.	2.52
3 sash, 14x30, divided, \$1.20....	3.60	238 ft. window stop, 14 ft. length, 3/4c	1.78
12 sash, 10x20, for dormers, \$1..	12.00	436 ft. inside base, 3 1/2c.....	15.26
1 set door jambs, 3' 0"x6' 8"	.90	436 ft. floor mold, 1/2c.....	2.18
5 set door jambs, 2' 10"x6' 8", 80c	4.00	260 ft. picture mold, 1 1/2c.....	3.90
4 set door jambs, 2' 8"x6' 8", 75c	3.00	130 ft. cornice mold, 9c.....	11.70
		Stairs	25.00

Case in bath room.....	12.00	Work on bay	15.00
Medicine cabinet	10.00	Closets	5.00
Kitchen case	20.00	45% cost of mill work for finishing.	165.10
<hr/>		<hr/>	
Total mill work.....	\$366.93	Total carpenter labor.....	\$564.65

CARPENTER LABOR

10,040 ft. framing lumber at \$10.	\$100.40
5,690 ft. sheathing, \$10	56.90
20 M. shingles, \$2.....	40.00
2,600 ft. siding, \$2	52.00
1,500 ft. flooring, \$2	30.00
11 squares smoothing floors, \$1.50	16.50
1,200 ft. porch floor, ceiling and cornice ceiling, \$15.....	18.00
650 ft. attic floor, \$15.....	9.75
Work on cornice.....	30.00
Setting frames	8.00
Porch steps	8.00
Cellar steps	10.00

RECAPITULATION

Excavating and masonry.....	\$ 571.50
Lumber	705.92
Mill work	366.93
Carpenter labor	564.65
Hardware and nails	59.00
Tin work	40.00
Plastering, 580 yards, at 28c....	162.40
Cistern and drain laying	40.00
Plumbing	230.00
Furnace	145.00
Electric wiring	45.00
Painting	210.00
Incidentals, 5%	149.77
<hr/>	
Total estimate	\$3,290.17

How To Use This Estimate

This estimate is figured at Omaha prices, with carpenter labor at 50 cents an hour. To use this estimate for other localities the reader will note that the price of each grade of lumber, as well as all other materials, is given in the regular trade units, that is per thousand feet for lumber, per thousand for shingles, per cubic yard for excavating, etc.

It is a simple matter to substitute the prices current in your vicinity for the prices given in this estimate and to extend the quantities and so determine the exact cost for your neighborhood.

For instance, framing lumber may be \$30 per thousand in your town while it is figured in this estimate at \$26. Simply extend the number of feet at \$30

Why the Bungalow?

ONE of the first bungalows in California attracted far more than its proper share of attention. This was due not so much to its all being on one floor, as to the unique exterior. It was designed to be as unconventional as possible, with every appearance of crudity on the outside, but with every refinement inside. Rough boulders and unpainted timbers formed the exterior walls, while costly tapestries and works of art were found inside. The entire building displayed the outward roughness of the pioneer with an interior arrangement and decoration to suit the most fastidious.

Styles have changed since then, but the problem of the Why of the Bungalow is no

nearer solved. We can only call attention to some of the facts in connection with them, and endeavor to show why so many styles are popular, and why they are being so numerous built, both as homes for the owners and for rental to those unable to purchase.

Probably the keynote to the American Home is Individuality. No two men having the same income have the same taste, the same saving ability, or the same requirements as to family and social life. No class of building lends itself to the needs of every one as the bungalow.

Every room in a hotel may be different in size and shape, trimmed with different woods, and hung with a variety of wall

decorations. No one knows all the variations which may be obtained in one building. And no one cares, for they cannot be seen or compared. Each is separate and exclusive. With a row of bungalows, it is otherwise. Every detail is apparent, the floor plan can almost be seen from the outside, while the owner or tenant of each can surround it with shrubbery, gardens or lawn as suits his particular fancy, knowing that no one else in the vicinity can duplicate his work exactly. True, long rows of bungalows just alike have been built, but in a few years each stands out separate from the others.

But we are speaking of the individual bungalow more particularly, and this is designed, both in plan and elevation, to suit the individual owner. So while the bungalow shown on these pages and on our supplement for this month, meets the needs of the owner perfectly, we venture to say that there is little probability of anyone ever building another exactly like it in every respect. Some detail will be changed, a door moved for some personal preference, the porch made wider, the windows different, the roof steeper, rooms finished in the attic, a different color scheme, stucco or shingles in place of siding, and possibly the plan reversed. Yes, there are opportunities for changes and each change makes a home better suited to that individual, and herein lies the chief note of the popularity of the bungalow.

What we have said of this bungalow applies to others of other styles. Each floor plan has innumerable possibilities as to location of doors and windows alone. Almost any plan can be adapted to almost any style of exterior. So the variety is infinite, even as the taste and preferences of men and women.

A hotel room or suite, an apartment, or the ordinary city house, need not be specially designed for individuals, nor should it be. Each room, each apartment, each house, must be the temporary home for many, and so must be typical or ideal rather than individual. Personal ideas may arrange the furnishings and fittings of a room or apartment to come nearer the wishes of each successive guest or tenant, but the knowledge that each occupies the space only temporarily prevents them from

making anything like permanent changes to suit their separate ideas.

With the bungalow it is different. The Architect consults the owner and learns his preferences, as well as the ultimate cost. The arrangement and number of rooms, closet space, mantels, etc., are all an individual matter. These could not well be incorporated in an apartment house, for the second tenant would want something entirely different. The bungalow is therefore the Individual Home, even as the apartment is the Typical Plan.

The location of the bungalow often has much to do with its design. This bungalow is built in a fairly level country, in a district where the lots are large. It would be impossible in the crowded city, or in the midst of elaborate mansions. It would not look out of place on the farm, but the plan is not entirely suited for that location. It belongs as it is, in the suburbs of a large city, where the owner is away most of the day, and requires peace and quiet at home after the noise, the turmoil and the strife through the day. Every city is surrounded by locations suited for buildings like this, and almost invariably they are shaded by beautiful trees, set well back from the street, and each has its lawn and garden. Can one be blamed for wanting to live in a home like this, especially after a few years in boarding houses, hotels, and city apartments?

Another feature of the bungalow is the sense of possession. One may enjoy the city, with its magnificent buildings, stores, libraries, museums and places of amusement. But how many of the city people go to the library, and the museum and the other buildings? They are just about as accessible to the suburban dweller when they want to go, and when they do not, they have so many other advantages the city dweller never knows. The possession of a home gives one a standing in the neighborhood which can never come to the apartment tenant. The one is firmly located, while the other's permanence is subject to the owner, the agent and the janitor. The one is consulted on matters concerning the welfare of the suburb, while the other takes from his mail box petitions and requests to "stand-by-the-party" and "don't-vote-the-yellow-dog-ticket." The one is known

to everyone as he passes, while the other neither knows nor cares who lives across the hall.

The bungalow broadens the acquaintance. Bound together for mutual advantages, a suburb possesses a great social feature. The taste of each owner, and the members of his family are known, respected and used by the community. The talents of each are carefully cultivated, and in church and society, each is given their welcome.

Probably not one in ten, however, would give the real reason why the bungalow is so popular. They will hedge on the question every time, and give every reason except the right one. Here it is:

It is the *children*. They must have fresh air, and good schools, and cheerful surroundings. What matter a few minutes longer getting to work, the rosy cheeks pay for it. Do we worry over the lack of theatres; the children furnish all the entertainment we require. So the bungalow is designed really for their benefit, from the screened porch where they can play in the shade or sleep when tired, to the attic, lined with wallboard, which is their playroom in the winter, as well as their sleeping room. Could they have as much space in the city? Possibly, but the expense would be prohibitive, and the chances are they would not be surrounded by one half the

advantages they here possess. Yes, the children are a factor both in the planning and living in a bungalow.

It is hardly necessary to call attention to the numberless good features of this bungalow. They speak for themselves, and both plan and exterior lend themselves to various modifications. The architect provided a bungalow in the suburbs, and there his function ceases. The owner must take it up at this point and make it a real home, and this, too, has been successfully accomplished. We can get many valuable ideas from both the architect's plans and the photographs of the bungalow as occupied.

Wrinkles for Woodworkers

There's one thing about lending, either of money or tools, it does help the memory.

Belts are to be guarded under table of vertical spindle shapers and the cutter guards kept in use.

A mighty good plan is to see that in heavy lifting the men are properly trained so they will act exactly together in taking hold or letting go. A still better plan is to use a hoist.

It's as natural as can be for a long, loose sleeve to reach out for trouble and drag someone's arm along with it. Have sleeves short and close-fitting and they will have a fair chance to dodge out of the way of hooky screws or biting gears.



The Rear of the Bungalow.



EDITORIAL



Peace, prosperity, and good times are at hand, there is a big rift in the clouds and much silver is visible beyond.

* * *

There is no need for trouble or delay in our everyday labors. The shock we suffered because of the ambitions of long ago has now spent its force, and, like the turbulence of the waters when reaching their level, becomes as peaceful and tranquil as a dish of milk; and people should pursue their daily occupations with the same confidence as before the storm broke loose.

* * *

These United States are at peace with the world, and have no grievance with any nation or people, nor are we aggressive; therefore, we have nothing to fear, nothing to dread, for it is not likely any of the combatants will infringe on our rights, or offer us indignities of sufficient import, to affect our present good understanding with the warring nations, or interfere with the sensible relations now existing between ourselves and our troubled friends. Peace, we hope, will soon perch on the standards of all combatants.

* * *

The departure of thousands of reservists to Germany, Austria, France, England, Belgium, and Russia, has done considerable towards relieving the non-employment stress, for it left many openings in the ranks that were rapidly filled by the men out of work, thus reducing the number of unemployed. Many builders were taken away, as many Germans and Austrians were connected with the building trades. A number of French reservists were employed in the cabinet trade as workers and finishers, and their places were taken chiefly by American workmen, but in some

instances by Italians. Many Canadians also went to Canada to volunteer for active service in the Canadian troops, going into English service to fight in France. These withdrawals must make openings for a large number of men.

* * *

It seems to be the fashion today to do without the old conventional parlor of our grandmothers, and utilize the room for other purposes than a family showroom. This relates chiefly to houses of medium cost and size. A family sized living room is constructed in place of a parlor, and is made to answer for parlor and general living room. Where it can be effected, a large fireplace is made in the room with an appropriate mantel having a large mirror in it, and there are places for two sofas, if possible. Any curios or works of art in pottery may stand on the mantel, or on brackets scattered about the walls. A plate shelf would make an appropriate addition, made a little wider, perhaps, than usual. This would do away with the "stuffiness" that is always present in our old-time parlor, where all the doors and windows are kept closed to keep out the dust and flies, and where there is no ventilation. The innovation is worthy of adoption in every home being built by a man of limited means. A useless room, which is often a source of danger to health, and a matter of more or less cost, has no place in modern economics.

* * *

By the destruction of Louvain, the world has lost many of its best works of art, and Gothic architecture of its kind. The reduction to ruin and ashes of this ancient and historical city, rich in monuments and art, and for centuries the educational capital

of Belgium, has shocked the civilized world. Louvain is to Belgium what Oxford is to England. It had at present an attendance of 2,500 students, and in the sixteenth century, when it was a rival of Oxford, Paris, and Salamanca, no less than 6,000 students attended its courses. Its library of 150,000 volumes, reported destroyed, was very rich in mediaeval history and literature and possessed some rare manuscripts as well. It was at Louvain that Justus Lipsius and the erudite Erasmus once taught. Then, again, the architectural value of the city was very great. As a specimen of civic Gothic architecture of the purely pointed character, its Hotel de Ville was the finest in Europe. This has fortunately not been destroyed. But we understand that the Collegiate church, and also that of St. Gertrude, with its richly carved sanctuary stalls, are in ruins.

* * *

In connection with the destruction of Louvain we may be glad that up to this writing Brussels and Antwerp are still intact, but it can hardly be hoped that all the architectural treasures of Belgium will emerge unscathed from the fiery trial through which that country is now passing. So far the famous buildings seem to have escaped. The decision of the Belgians to evacuate Brussels preserved many notable buildings from danger from shell fire. Brussels possesses one of the many beautiful Gothic town halls for which Belgium is famous, and its Palace of Justice is one of the finest modern buildings in Europe. But nothing in this city is more characteristic than the guild houses in the Place Royale. They were built for the Mediaeval trade guild, whose signs are still emblazoned on their facades and sculptured in gilt figures on their pinnacles. They represent the latest phase of Gothic, as it found expression in Flanders, and have considerably influenced subsequent municipal building even in the Renaissance period.

* * *

Success in business comes through the application of good ideas and the tenacious pursuit of high ideals. The basic idea and the highest ideal of any truly successful business is service. Advertising occupies the place it does today because it has demonstrated its capacity for service. It is a

convenient method by which business may express its ideals to the public. It is respected because it is respectable. It is of profit to the advertisers to the extent that they make their offerings of profit to the public. Glance over the advertising in this journal and see what is going on in the business world. We have all heard of and admired George B. Cortelyou, who progressed from an unimportant clerkship to be successively head of the Department of Commerce and Labor, Postmaster General, and Secretary of State of the United States, and finally President of a great New York corporation, says: "I do not think this is a time for despair, but rather for fresh efforts to push ahead into new fields as well as for the development of the old ones. Least of all, I think this a time for abatement for publicity efforts; indeed, these should be redoubled now, because if advertising increases demand and stimulates production, this is a time to advertise." And, he might have added, it will help to make times better all around.

* * *

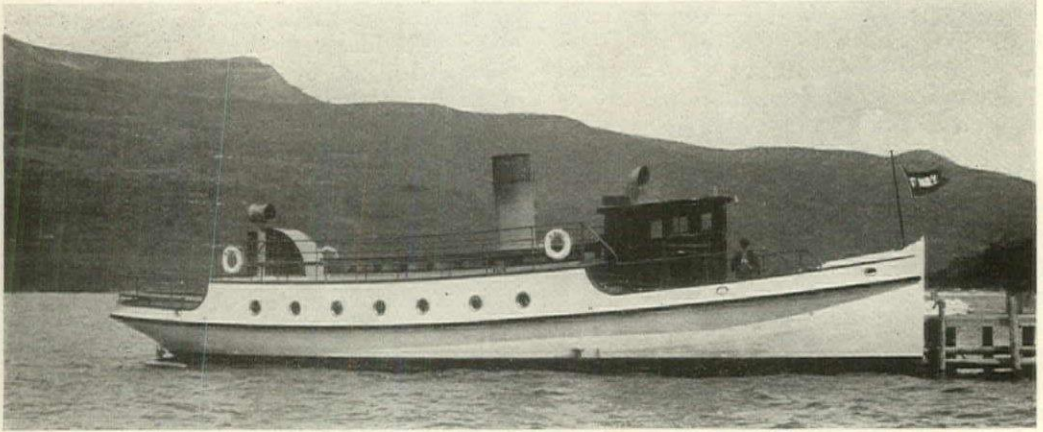
For every human being in the United States \$11 was last year put into a building of some kind. The money expended in such operations just about balances our government debt.

There are no figures to show definitely how much of this immense sum went into buildings that earn nothing, but far more than half of it certainly has become nailed down into an investment that is non-creative.

Most of the cash a man devotes to his home at once goes into the drone class, whereas, the money he spends for a chicken house or a better stable for his cows or improved farm implements immediately begins to work and earns interest upon the investment. A new store is a money grubber, but frills upon the home are not.

Right here is one reason why Europeans, who as a class earn far less every year than Americans, have such stupendous sums to invest in securities. Building in Europe cannot exceed \$2 for each person as against five times that for Americans.

No other part of the earth's surface was ever covered in so brief a time with such a colossal amount of buildings as our particular slice of North America.



The Yacht St. Mary on Lake McDonald. Trimmed in Birch. Lee & Brinton, Architects.

Birch for Interior Finish

R. S. Kellogg

An Address Delivered Before the National Association
of Building Owners and Managers, Duluth, Minn.

BIRCH trees are common in the Northern woods from Maine to Minnesota, and wherever found, they are among the most striking and beautiful inhabitants of the forest. The yellow birch, which is the chief source of birch lumber, reaches its perfection in Wisconsin and Michigan, and more than one-half of the total cut of birch is manufactured in these two states. It is a well-known fact that the individuals of a species attain their best development in the regions where that species is most abundant. For this reason, the birch lumber from Wisconsin and Michigan is of the highest quality. The trees are large, symmetrical, clear and sound. A height of 80 feet and a diameter of 30 inches is not uncommon. Timber of this sort yields a finishing wood which has no superiors, and few competitors. The city dweller of today prizes birch woodwork in his home as much as Hiawatha did a birch bark canoe. Both are evidence of good judgment in the selection of materials.

The wood of birch is close-grained and heavy. In bending and crushing strength, stiffness, toughness, and hardness, it ranks above many hardwoods and stands with beech, hard maple, and oak—woods whose qualities in these respects are universally appreciated. It is the close, interwoven structure of birch that gives this wood its

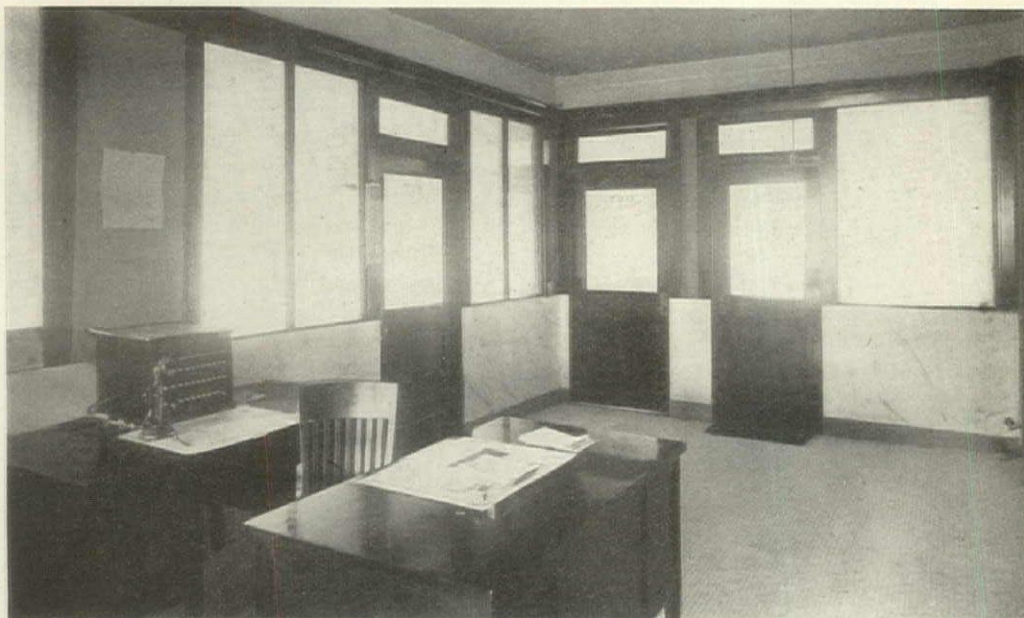
strength, density, wear-resisting, and stain-holding qualities.

The sapwood of yellow birch is yellowish, the heartwood light to dark reddish brown. It is the heartwood of birch that furnishes the beautiful red birch, which has no superior even in mahogany. Both sapwood and heartwood take a brilliant, satiny polish. The figure of curly birch is especially attractive, while the sparkling lustre of the finished wood gives a richness of tone such as is usually looked for only in the costliest imported woods.

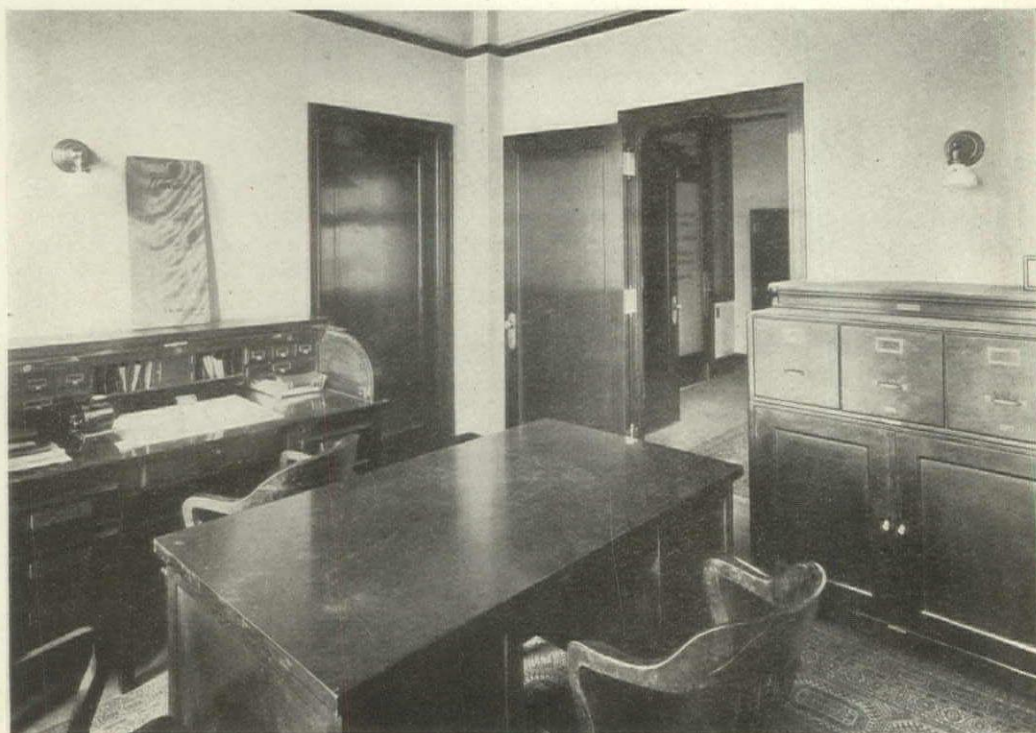
USES OF BIRCH

Birch is one of the most widely useful woods. A recent tabulation of factory reports show that birch is used for nearly 200 distinct purposes, ranging from automobiles to zither bodies, and covering such diverse articles as barber chairs, billiard tables, wagon bottoms, cheese boxes, butter moulds, electrotype bases, wagon hubs, piano cases, refrigerators, shoe pegs, spools, farm implements, and interior finish.

More than half of the total output of birch is used in the manufacture of furniture and fixtures, and for mill-work. The latter includes all kinds of interior finish, veneered doors and high grade flooring. In fact, it is in the field of interior finish that birch finds its highest and most appropriate use. Employed originally as a substi-



An Office in the State Bank Building, Little Rock, Ark. Trimmed in Birch. Geo. R. Mann, Architect.



Office of Burton Cotton Lumber Co., Salt Lake City. Eames & Young, Architects.

tute for mahogany, birch is now appreciated for many sterling qualities of its own, some of which are not possessed by mahogany.

There are as many styles of birch trim as there are designers who wish to produce an unusual or particularly appropriate effect. My own preference is for the simpler styles which offer the fewest possible angles and corners to collect dust and at the same time give the largest uninterrupted surface to display the figure and sheen of the wood itself. For the same reason, my choice is for the softer hued stains which bring out the qualities of the wood in harmonious fashion, rather than for more brilliant colors, or paints which completely obscure the natural beauty of the wood. We paint iron and brick for protective reasons as well as to give a more pleasing effect. When we work with wood, it should be our purpose to enhance, and not obscure, its characteristics of figure, color and grain.

The perfecting of veneering processes, and especially of rotary cut veneer, enables us to get at a reasonable price, a combination of large sizes and beautiful figures in panels that would be altogether impossible were we restricted to solid lumber. Moreover, the well built up panel is stronger and much less likely to warp or check than is a solid piece of wood of the same or even much greater thickness. Veneered panels may be obtained in almost any size desired, and where appropriate they provide a wonderfully effective means of interior finishing.

Recent years have seen a great advance in the manufacture of artistic doors, which are at the same time simple in design and reasonable in price. Here again, progress has been made by the use of veneer. There are many styles of doors to choose from. One of the most pleasing to me is a single panel birch door stained silver gray, but other styles have many admirers.

Among the most useful developments of modern lumber manufacturing is the production of high grade hardwood flooring. This flooring is manufactured to exact sizes from selected, thoroughly seasoned stock, and is as carefully handled as is interior finish. In fact, a beautiful and durable hardwood floor is an important part of the

inside of a building, now that carpets have been largely replaced by rugs.

Hardwood flooring is made from kiln-dried stock, stored in dry sheds and shipped in closed cars to prevent the absorption of moisture and the user should see that it is carefully handled, correctly laid, and properly finished. Some of the points to bear in mind are to avoid unloading the flooring in damp weather; not to store it in open sheds or in newly plastered buildings; nor to lay it until the building is thoroughly dried out. When an under-floor is used, as is advisable with the thinner sizes, the flooring should be laid diagonally across the sub-floor, and the latter should be dressed to even thickness. The best practice indicates the use of steel cut nails for hardwood flooring. The nails are manufactured especially for this purpose and should be driven at an angle of 45 degrees.

Wherever a particularly rich effect is desired to harmonize with finish and furnishing, nothing is superior to a selected red birch floor. It is as strong as maple, sufficiently hard to stand service, and of unusual beauty of figure and color. Such a floor finished natural is not out of place in the most palatial structure.

Birch flooring is manufactured and graded under the rules of the Maple Flooring Manufacturers' Association, and it is a high class standard product in respect to widths, thickness, and quality.

The demand for conveniences and economy of space has resulted in a wide variety of built-in work all the way from kitchen to bedroom. Built-in bookcases, china closets, sideboards and wardrobes are considered among the necessities of the modern residence. For them no wood is superior to birch. In addition to its desirable qualities of figure and color, birch looks well and fulfills every requirement of high-grade cabinet wood. We have all seen beautiful examples of built-in work that harmonize perfectly with finish and furniture which are also the ultimate of convenience and utility. Large quantities of birch have for many years gone into furniture factories to emerge as mahogany. The only fault we have to find with this is that birch has not received the popular approval it would if the furniture had been generally known to be birch. Perhaps we are getting to the time when we consider it



Residence of Arthur W. Wood, Ardsley, N. Y. Birch Trim. Arthur T. Remick, Architect.



Grand Canyon Hotel, Yellowstone National Park. Finished in Birch Throughout. Robert C. Reamer, Architect.

more important to purchase useful democratic material under whatever name it comes than to have an imitation of an aristocrat. At least, I hope so, for birch has the qualities required of the best furniture woods. More birch is used for parlor furniture frames than is any other wood. Every argument in favor of birch for interior finish applies equally well to birch for furniture and there is added one of harmony between finish and furnishing.

STAINING BIRCH

I have seen many cases in which good wood has been spoiled by poor stains. When we have gone to the expense of getting the best wood there is for our interior finish, we should take care to see that it is properly and appropriately stained.

Reliable stains of nearly any shade desired may be purchased in shape for applying. Samples and color schemes are freely supplied by the manufacturers. Care should be exercised, however, to make sure that the stains selected are of tested quality. Care should also be exercised to have the wood thoroughly seasoned, surfaced and cleansed before applying the stain. Since birch is a close-grained wood, a paste filler is not necessary. Birch is just the right density and texture to form a superior base for white enamel, and it is largely used for this purpose.

Stains are designated as spirit, oil, or water stains, according as the medium in which the color is held in solution is alcohol, oil or acid. Spirit stains are not recommended for birch since the alcohol evaporates so rapidly that it is difficult to apply uniformly. Oil stains give splendid effects, but not as clear and transparent colors as are produced with water stains. Water or acid stains are evenly and quickly applied and permit any method of finishing over them. The objection that water stains sometimes raise the grain of the wood is averted by sponging the wood with clear water and sanding it smooth before applying the stain.

Varnish magnifies the natural appearance of the wood, hence defects as well as natural beauty are also magnified. This makes it especially important to have the surface smooth and free from defects, dirt and dust before the varnish is put on. Var-

nish works best at a temperature of about 70 degrees and in a dry atmosphere.

Rubbed, or rubbed and polished finishes give the best results with birch. I recently saw an excellent silver gray produced on birch by one coat of acid stain followed by sand papering, finished with one coat each of white shellac and wax and then rubbed. There are also some flat finishes that are satisfactory for certain purposes. The user of birch should always remember, however, that he is handling a high-class, hardwood whose peculiar richness of tone and figure is worthy of his most painstaking efforts.

WHERE TO USE BIRCH

Having thus outlined the qualities of birch, the next is—where shall we use it? My natural inclination is to reply, Everywhere in the interior of your building. It is of proven worth for such hard service as store counters, showcases and fixtures, while its merits make it just as appropriate for trim of the finest of residences, apartments, offices and hotels. Moreover, the reasonable cost of birch places it easily within the reach of the builder of the modest cottage or bungalow. The colonial hall and stairway in white enamel, the living room in silver gray, the dining room in one of the many shades of brown, the bedroom in white enamel or natural, the den to suit the owner's particular fancy—all offer suitable opportunities for the use of birch. Among the stains which I like best on birch are silver gray, walnut, fumed oak, natural and mission brown. These are colors which harmonize well with general schemes of decoration, and are not likely to get on anybody's nerves. However, I have no quarrel with the user of birch who prefers an entirely different selection. The wood will take and hold permanently any stain of the right kind that is properly applied. So good an authority as Keith says that birch is the ideal high light for a scheme of coloring in browns with notes of blue and orange, also that silver gray is beautiful in a room with walls of dull old blue, and a ceiling of silver gray on which are frescoed pink old roses.

One of the best features of birch is that it combines so well with other woods. I have seen excellent combinations of maple or oak floors with birch trim, and of birch

venered doors with a trim of other woods or white enamel. Your own observation will furnish a multitude of instances of this sort. It is evidence enough of the qualities of birch and its popularity with architects to say that it is used in such apartment buildings as the Alabama in Washington, D. C.; the Esplanade in Baltimore; The Rossonian in Forth Worth; the Collinwood in Kansas City, and the Peery in Ogden, Utah; in hotels like the Fort Pitt in Pittsburgh; the Ansley in Atlanta; the New Willard in Washington; the Seminole in Jacksonville; The Chickasaw in Memphis; the Claypool in Indianapolis; the Congress in Chicago; The Grunewald in New Orleans; the Grand Canyon in Yellowstone Park; the Frye in

Seattle; the Multnomah in Portland; the Palace and St. Francis in San Francisco; the Alexandria in Los Angeles, and the Grant in San Diego. In office buildings like the Diamond Bank in Pittsburgh; the Rand-McNally in Chicago; the State National Bank in Little Rock; the Walker Bank in Salt Lake City; the Henry in Portland; The Clark in Los Angeles, and in uncounted residences throughout the United States.

These examples speak more eloquently than words of the advantages which birch offers in the way of beauty, service and economy in modern woodwork. Did it not possess these desirable attributes, its use would not be so universal nor its popularity so great.

Comfort and Moderate Cost

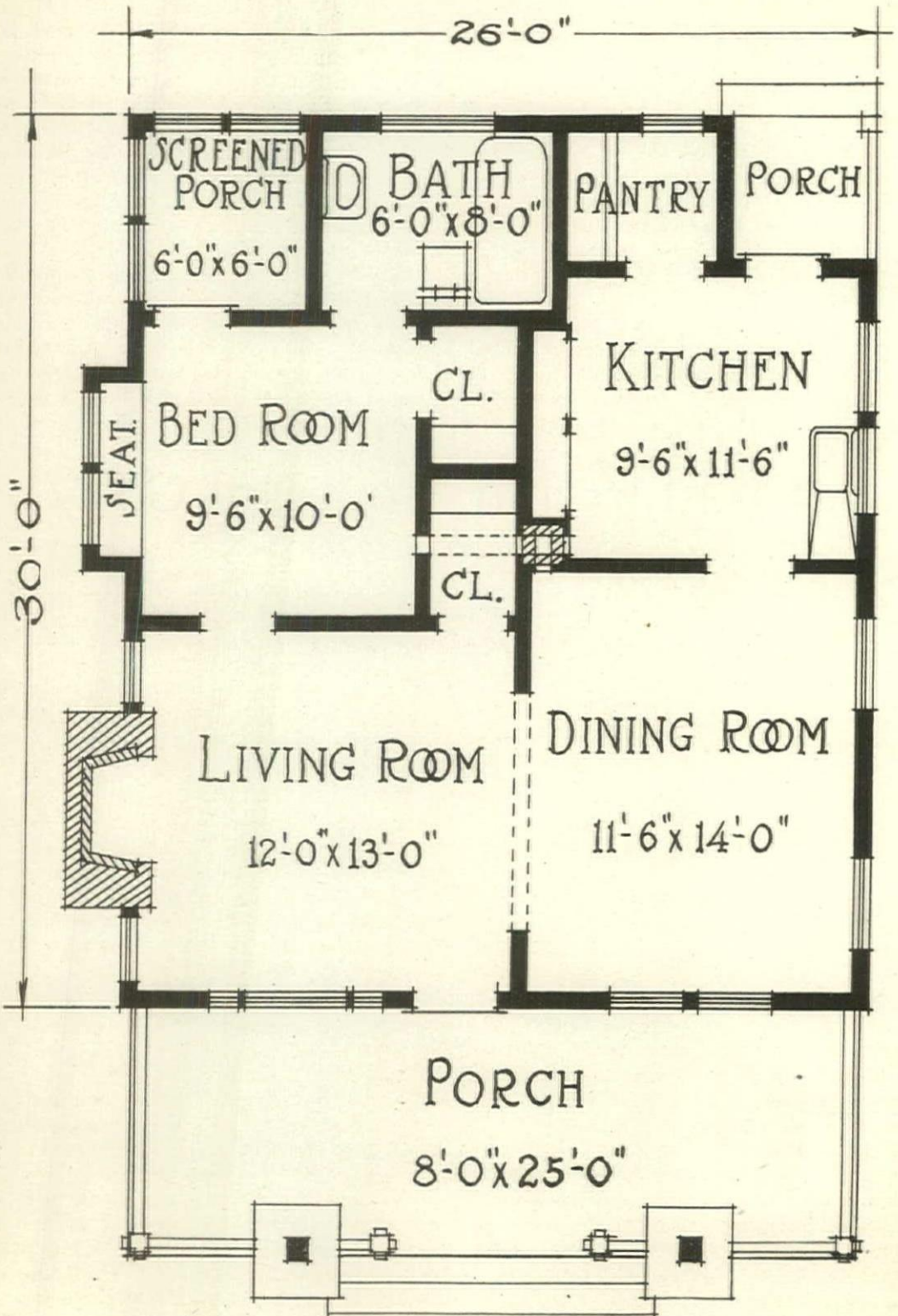
Jud Yoho, Architect

A VIEW and floor plan are here shown of a bungalow which has been built in the West for the moderate outlay of \$1,300.00, this cost not including heating plant. The exterior is of cedar shingles, laid in a special manner as shown in the picture of the elevation, trimmings being rough fir. The chimney is cement finish foundation wall and pier bases stucco. Roof is composition. The exterior design has many charming features of

true bungalow character; notably the heavy timbered beam effect for the entrance arch, the pier design, the brackets. The plan leaves little to be desired. It provides a sleeping porch off the bedroom, liberal closet space, a fine pantry, and large cabinet in the kitchen. Stove and fireplace heat is shown in the plan, which can, however, be readily adapted for hot water or for hot air heating system. For a bungalow of limited exterior



A Pleasing Bungalow.



dimensions, namely twenty-six feet width by thirty feet length, exclusive of porch, the accommodations are noteworthy and remarkable; the living room and dining room, following the "regulation" type, are all in one room, clear across the house

width, with the fireplace projecting well beyond the building line and trespassing on the interior space as little as possible. No one will complain of the closet space, which is very good. The plan, in fact, is of extraordinary value, very useful indeed.

Your Business Library

Frank Farrington

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YOU are perhaps the one man in a hundred who appreciates the value of business literature and spends more or less money every year to add to his collection of business books.

You may realize the value of having at hand the collected ideas of other men who have made a study of business methods, and yet it is likely that you do not regard what business literature you have in the light of a library.

Perhaps nothing is gained by calling your collection of business books a library, and yet I believe it does give it added importance to allow it that dignity. And more than that, if you habitually consider your business literature in that concrete way you will be more likely to give it the care and the attention it deserves.

A miscellaneous aggregation of books scattered here and there around the place will fail to attract the attention the books deserve either as individuals or as a class. Under such conditions it is left for each book to make its appeal alone and probably each book will be lost to sight much of the time because there is no place where it belongs.

The lawyer, the preacher, the doctor, each has his library, which is nothing more than a business library built up for the benefit of his profession. He has a place for his books and he keeps them there in good order so he can find what he wants when he wants it. Failure to arrange his books in an orderly manner renders his library of little value, or perhaps even worthless in the emergency. Proper arrangement gives the books fifty per cent more value for actual use, and the collection of the books into the physical form of

a library gives them a further value for the effect they produce on the mind of the visitor and for the influence they possess over the mind of the owner.

The same rules that apply to the professional man's business library apply similarly to your business library. The main difference between your library and the doctor's is in the number of volumes. For you to think you can achieve perfection in business ability merely by adding to your store of knowledge those facts and ideas you pick up in your own experience is the same as for the doctor to think he can develop fast enough through his own observations and discoveries to keep pace with the medical development of the day.

If we are going to get anywhere near the top in any line of endeavor, professional or otherwise, we must profit by what other men have done. We must make use of the brains of other people. Our own little experiences are valuable to us and they teach us much, but they are limited. We appreciate this as soon as we begin to investigate the experiences of others.

In every office, shop or store there ought to be a *growing* collection of business books and these books ought to be kept in a suitable case or on suitable shelves where they will be easily reached by anyone connected with the business. The business is so small that it is a one-man affair sometimes, but even so the library is none the less important, perhaps I should say it is all the more important. If the business is large and the employes many, the library ought to be correspondingly large and divided or duplicated so that separate departments or rooms or floors shall have each its own library.

Whatever the business, whatever the managing, operating or selling conditions, there ought to be good business literature kept within reach of the help—and of the employer. The employes will be benefited by reading good business literature and it will pay them to take an interest in that kind of reading, but the manager *must* read. The business cannot be a real success without the aid of business literature.

In practically every business there are times during the day when the employer and the employe can find time to do a little reading, if it is only during the dinner or supper hour. During the times when one must let down, instead of merely loafing, it pays to read something out of the business library. If a man wants to get ahead he can do it with the aid of good business books. If he does not want to get ahead—well, he will not be reading this.

The positions in offices and shops are filled to too large an extent with people who are simply waiting and hanging on. They are living from week to week with nothing more than a vague hope that sometime, somehow, luck will come their way. As a matter of fact they give little thought to what they are going to do or become. It is perhaps the fault of the employer that his employes are not oftener reminded of the fact that they have in their own hands the making of their future, and the one thing that will do more than anything else to develop their power and their ability is the reading of good business literature.

It is not necessary to have even a "five-foot" shelf of business books. A five-book business library will make a starter for the small business and a dozen well-chosen books will make an assortment that will cover a very good business education for the average man if he gets all that is in them. When the force is large enough so that a dozen books will not suffice, the dozen may be duplicated. Of course it is wise to add to the collection such new and desirable books as are published from time to time.

Unfortunately the method by which most men buy business books is to order when compelled to do so by the insistence of a canvasser or when a printed advertisement is so forceful as to leave no loop-hole of escape. Instead of buying only when forced

into it, a man should constantly have his eyes open for an opportunity to add a new, valuable book to his business library. Every good, new business book means new opportunities for the reader. He ought to be looking for opportunities instead of sitting back waiting for them to find him.

There are lines along which all business men need to study. It is important that we learn better business methods of all kinds and that we develop higher degrees of efficiency. There are books that cover all the departments of your business and no one can read them without being made worth more money in salary or in profits.

The editor of any good trade paper or business magazine will advise a subscriber as to what books are best for him to buy for use in his business library. In fact, practically all business books can be bought from the publishers of the trade paper. If you know of a book you want, send the price to the trade paper and you will get the book postpaid with no inconvenience to yourself.

My advice to the man who has never made a start toward a business library is to ask his trade paper editor to name for him in the order of importance the best five or ten books for him to buy.

While it is important to buy the books, it is more important to get them read. The attitude of the employer or manager should not be that the employes are the only ones to do the reading. The boss himself needs development as much as anyone under him. We are all on our way up or down. The question as to which can be very nearly answered by noting whether we are or are not readers of business literature.

There ought to be a willingness to read business literature and this willingness ought to amount even to anxiety. We ought all to be anxious to get ahead and anxious to find means of doing so. The key to success is knowledge. Some knowledge we can get by our own experience, but more we can get from books. The book route to success is so much easier than the haphazard, pick-it-up-as-you-go-along way, that it ought to be the only way.

This business library ought to be a circulating library to the extent that everyone in the place shall be allowed to take

any book home to read. Employes ought to be encouraged to do such reading outside. They ought to be shown its great advantage to them. When the average employe is asked by the manager to do anything like that, his first thought is likely to be that he is being crowded into extra effort. His first thought ought to be that he is being shown the way to make good, to develop into something more than an employe.

It is possible to devise a study course based on the business library, by means of which those who take an interest in the reading may be given a sort of examination on the subjects covered. Some employes will not take kindly to this and it perhaps should not be made compulsory, but the right kind of help will realize its importance as an aid to development. It ought to be obvious to every employe worth having that the great benefit in such things comes to the man who does the studying rather than to his employer.

A simple little plan which will have a tendency to develop interest in the business library as a reading course is to arrange a point system by which on a blackboard made for the purpose each employe will be listed with points opposite his name indicating the number of books read. If the books are of a uniform size, each might be represented by five points and a total kept on the board to represent the number of books read by each person. This would act as a stimulus by making public to the rest of the force what each one had read. It might even be feasible to offer a prize or a premium in the form of a new book to each one having read all the books in the library. A monthly meeting for the discussion of the contents of each book would be valuable and have the tendency to prevent any employe claiming to have read a book not actually read.

A most important feature of the business library should be the trade papers. It is not enough to read business books. There is much in the trade press and technical and business periodicals that never gets into a book, and in addition there is the news of the trade that will keep a man informed in regard to his work and the state of the market.

Some employes take the position

that it is not their business to keep themselves informed, that they are merely employes and all they have to do is to perform their allotted tasks. This may be theoretically correct, but when it comes time to raise wages, or when it comes time to choose which employes shall be kept while others are discharged, the fortunate ones will be those who have tried to see how much they could learn about the business rather than how little. And when another employer is looking for a man suitable to make into a manager, or when the present employer wants to advance a man to a managership, the one recommended is certain to be he who has studied the trade papers and informed himself of trade conditions.

It is not enough to take merely one trade paper and keep it on file, even though it is the best of its kind. There ought to be a representative line taken covering all branches of the work of the house. The trade paper is today so essential a part of the business development of its readers that it is almost conservative to say that a business man will succeed in direct proportion to the amount of attention he gives such papers.

The trade paper ought to be the important feature in every business library, taken in sufficient numbers so the employes may have an opportunity to read them, either at the office or by taking copies home. Many employers subscribe for extra copies to go to the homes of interested employes and the expense which might at first glance seem extravagant, is in reality insignificant in contrast with the results produced. Any employe who can thus be induced to read a trade paper will return the business a hundredfold on the cost of the subscription. Trade papers, like business books, make more efficient service and result in increased return.

The business library will be the best paying investment the house ever made if care and intelligence are used in the choice of the literature and of the methods for getting it read.

The man who thinks he has a right to turn out work in any manner that pleases him is much mistaken, for it is his duty to give his customers good service.

Additions to Old and New Houses

Chas. P. Rawson, Architect

THERE are many times during the winter when carpenters are not busy. The few suggestions shown herewith may perhaps help them to induce house owners to add to the convenience or attractiveness of their homes and thereby also help fill in the carpenters' leisure hours when it is too cold to work out of doors. Or perhaps they will be of assistance in new houses.

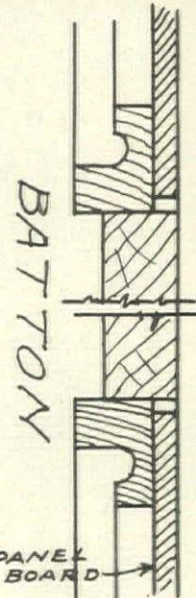
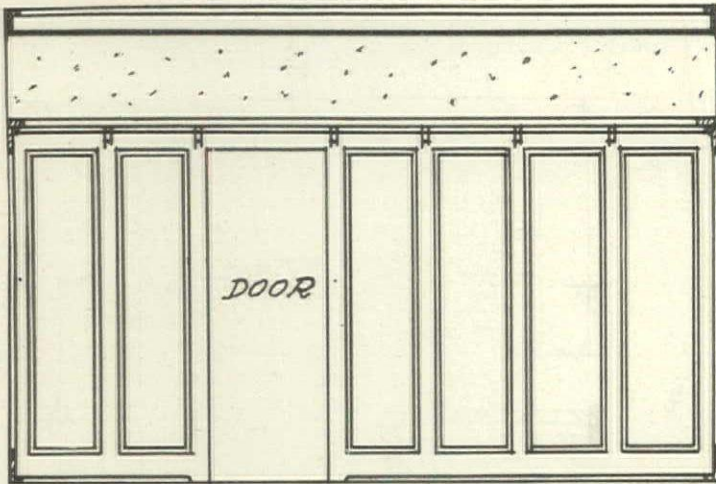
There is hardly a dining room, except those built in the newer and more expensive houses, that could not be greatly improved at small expense by putting in a high wood wainscot. It is not necessary to have expensive panelling made at the mills, because any carpenter can make a wainscot such as that shown in the drawing right on the job with such millwork as he can make or get at a reasonable figure. It is well to make the wainscot the same height as the doors and windows, providing their caps line up. In most cases, if the new work is to be stained, it would be better to remove the old inside trim, but if it is to be painted, and painted woodwork is very popular these days, the old trim may be left as it is or only slightly remodeled. Of course, a cornice or beams might be added to advantage. In the latter case, the ceiling should be tinted, or painted, and the small space between the top of wainscot and the ceiling hung with some harmonizing wall covering. The panels are made of thin veneering, mounted on wood or pulp board. They are easily obtained in sheets up to eighteen inches wide and eight feet long and do not shrink. They should be put against the plastering as are also the battens, cap and base and then the molding is put on over the panels. It would probably be better in all cases to remove the old bead casing of the doors and windows so that the new cap may be continuous.

It is impossible in these days of sanitary plumbing to enclose the space under the kitchen sink, as was formerly done, for cooking utensils, etc. A clever way to utilize this space in a perfectly sanitary manner is to build two small cabinets or

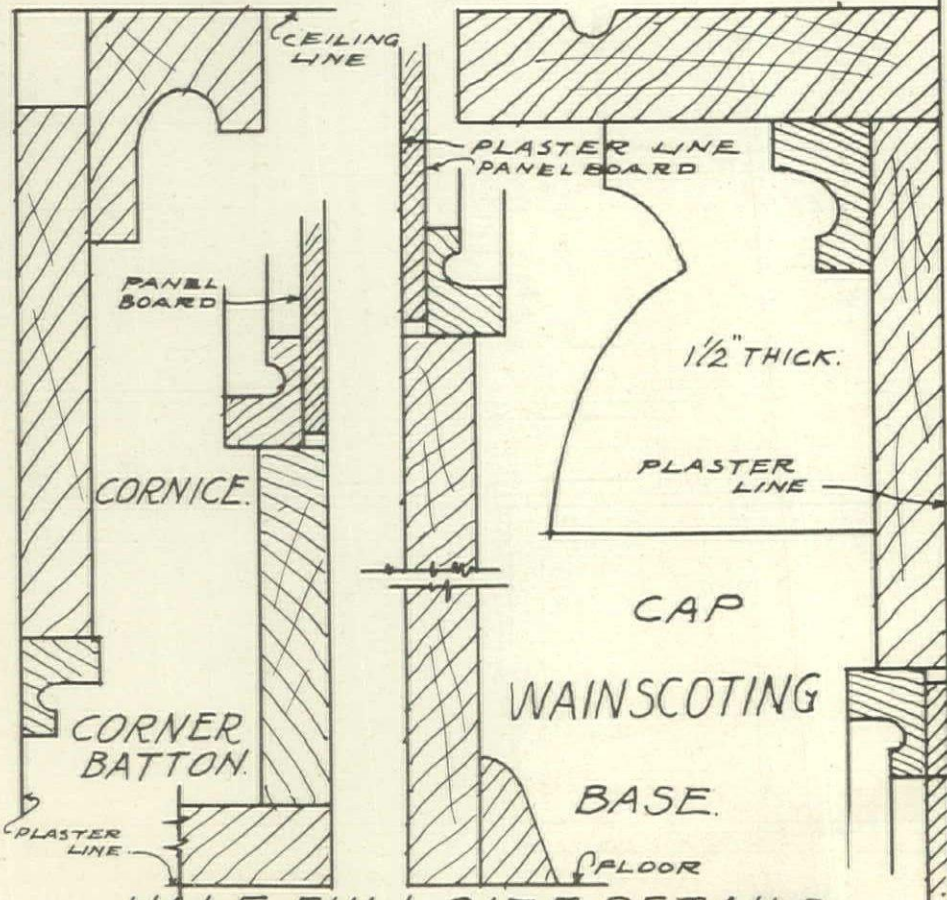
cupboards mounted on castors so that they may be moved out if desired. When they are in place under the sink, the plumbing is not covered up, but occupies the space between the cabinets. When the sink has a double drip board, the cabinets are both the same size. When only one drip board is provided, one of the cabinets must be narrower, or may be entirely omitted if desired.

The little cupboards should, of course, be provided with doors and a single shelf. Hooks should be put on the back of the doors, and on the back of the case and the front edge of the shelf set back two inches from the latter. The drawings are to scale and give the size of the case, but exact measurements should always be taken of the space under any sink which it is intended to use for this purpose. Such cabinets will be found very useful and may be installed in any kitchen to advantage.

Years ago, when window seats came into vogue, they were, of course, built under a window and were therefore not of any use as a seat, and no house owner of the present day wants to provide anything that is not of use. Properly designed seats built against the walls, at the side of a fireplace or in a corner of a room, will be found useful and attractive, and also most convenient. Seats should be boxed in to form chests for storage and hinged covers should be provided, which when raised give access to the storage space. A sloping back should always be placed against the wall as this adds greatly to the comfort. When placed in a corner, only one end will be necessary. This should have a low arm. It may be desirable to place the front farther back than shown in the drawing so one will not kick the heels against it when sitting down. A drawer may be provided instead of a hinged cover if desired. In some rooms a drawer will serve the purpose better, and this will save removing the cushion when opening. A cushion about three inches thick should be placed on all seats. Seats should be made low and wide.



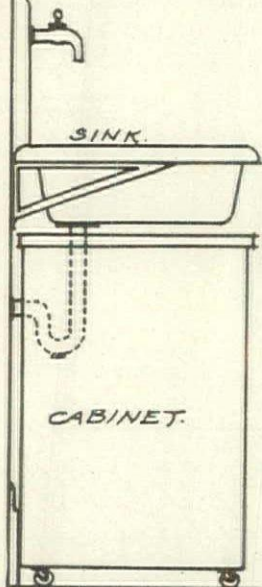
ELEVATION OF ROOM.
SCALE $\frac{1}{4}'' = 1'-0''$



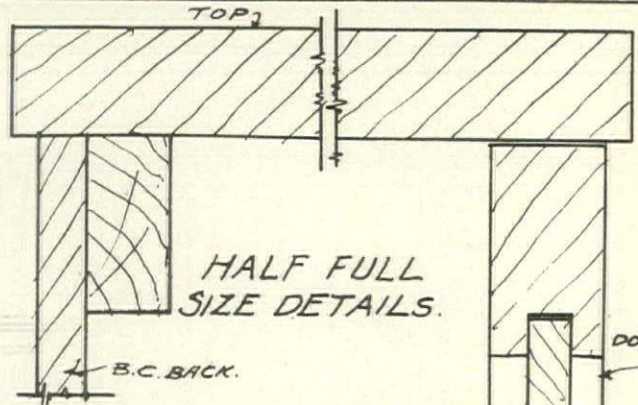
HALF FULL SIZE DETAILS

C.P.R.

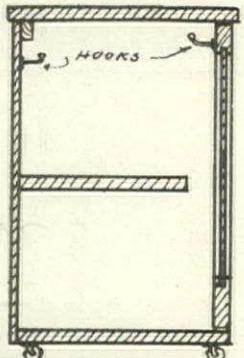
CABINET FOR KITCHEN SINK.



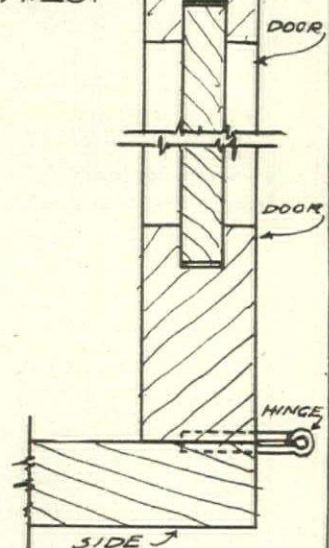
SIDE ELEVATION



HALF FULL SIZE DETAILS.

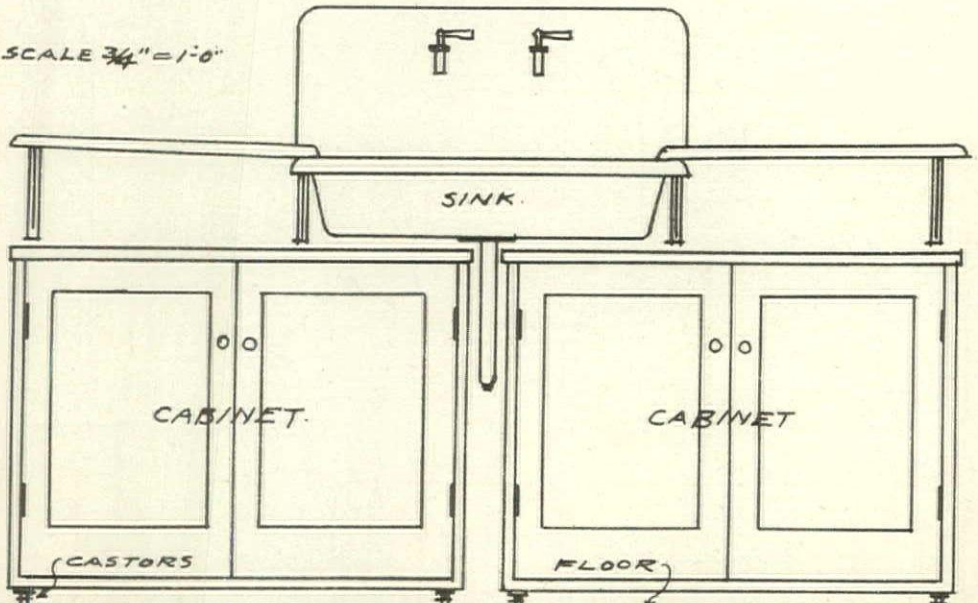


SECTION.



SIDE ↗

SCALE $\frac{3}{4}$ " = 1'-0"

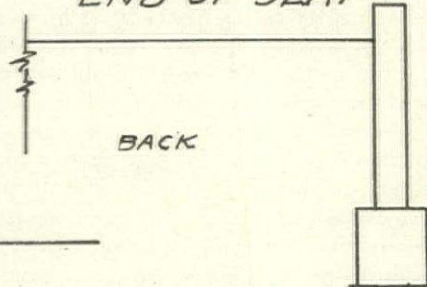
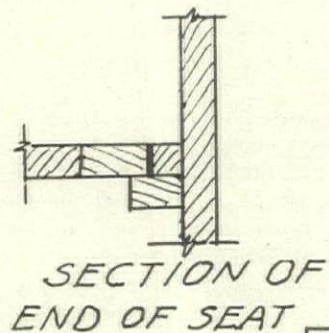
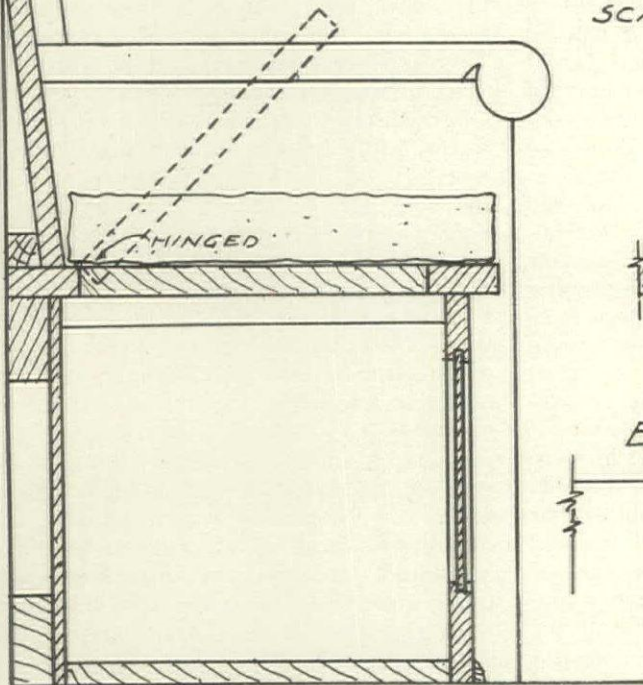


FRONT ELEVATION

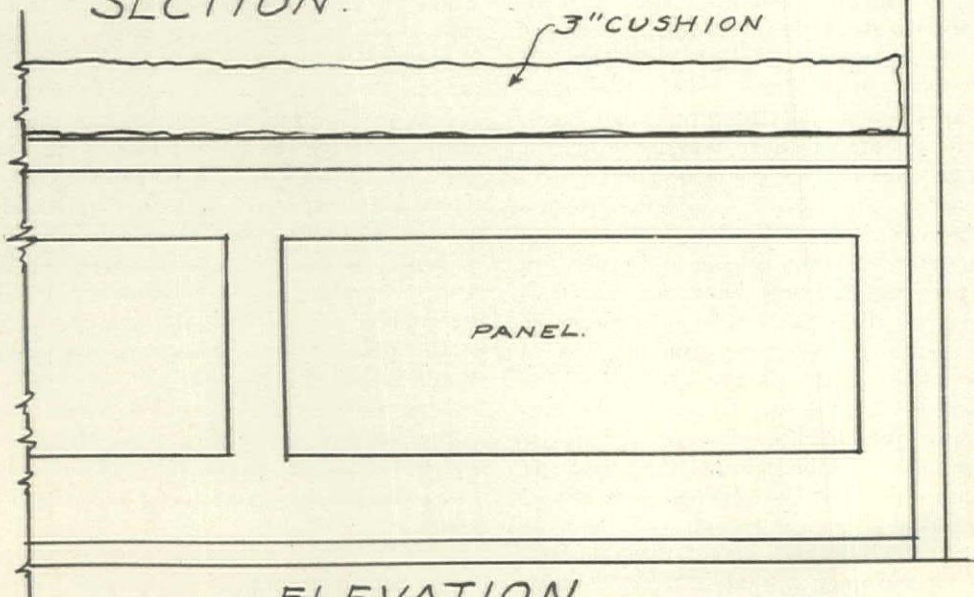
C.R.R.

A USEFUL BOX SEAT FOR ANY ROOM.

SCALE 1/2" = 1'-0"



SECTION.



ELEVATION

C.P.R.

Measuring Interiors for Mill Work

A Satisfactory Solution of the Problem

THERE are undoubtedly many systems for each man who measures up the mill work will have a method which differs in some degree from that of another man; but from my experience of the work the writer has come to the conclusion that the one which is described herein is the most satisfactory—to me at least. In the first place, the man who takes measurements at buildings, it is needless to say, should be thoroughly familiar with every branch and detail of the planing mill; should be a practical mechanic who has had much experience, besides having ideas of his own. Often he will be called upon to make suggestions to people who are building or making alterations, and it would be greatly to his discredit if he were not able to supply them. John Wavrek, Jr., writing in the *Woodworker*, states that he has often come across people who intend to have certain work done in their houses, yet do not exactly know what they want; or, rather, do not know the details of the job. In such cases the mill man should be able to give ideas and suggestions. If he is able to do so, people will have confidence in him; thereon his inability to do this will be detrimental to the interests of the concern which employs him. On the other hand, he will be directly the cause, to a great extent, of the mill owner's success, for people will have confidence in him, knowing that the work will be right.

In some mills there is a very lax system in regard to taking data at houses for the interior, calling any man to do the work who may not be very busy at the time there is a call to take such measurements. This is positively wrong practice, for in many instances the party who takes the measurements does not write out the cutting bills for the mill, but it is done by the foreman or some man in the office. If the data should not be very explicit, it will cause a lot of running back and forth in trying to find out the correct data, thereby squandering much valuable time, besides delaying the work, and all because the management employs the wrong method in this respect.

There are some instances which justify the bench man taking his own measurements, as, for instance, the stair man. There are some stairways which are much complicated, requiring very exact data, for a mistake in this kind of work is very costly to the mill. In such an instance it would certainly be the wiser procedure to have the stair-builder take the data himself. Sometimes there is a store front to be made which has some complicated features, and this, too, should be measured up by the man who is going to make it. However, these are exceptional cases which do not occur often. As a rule, there should be one man employed to take all the measurements.

There is another advantage in this, because of the fact that the one man gets to know the peculiarities and desires of the different contractors with whom he comes in contact, and will therefore know how to approach them and arrange to have their work gotten out according to their requirements. Another advantage to be gained by this system is that one man will be acquainted with progress of the various jobs which are in the course of construction, and can see to it that interior work for them is gotten out at the proper time, so that it can be sent on the job when needed.

For an example, we will assume that we are to measure up the interior of an ordinary house three stories in height. To be thoroughly familiar with the job which we are to work on, it is essential that we read up the specifications thoroughly, also study the plan well. Of course, in most cases there are some changes made either in the plans or the specifications, which should be noted in the estimate or contract. This latter sheet should also be taken along to the job and note taken to see that there are no extras put to the job without being noted on the slips containing the measurements.

A very handy book to use to take data is one which has loose leaves that can be removed upon having completed the measurements, and placed on file. The sheets are in size about 5x7 inches, and section-

ruled. This ruling I find very convenient in making sketches, and especially in taking data for staircases. We will use a 4-foot rule as the most convenient for our purpose, besides a handy steel tape for the stair work.

First, then, I go to the uppermost floor, which is the third in this instance, and start by taking the measurements of all the windows first. The handiest and quickest method is to take the sash sizes. Having this, and knowing the construction of the frames, we have a very good basis to work on. There would be one twin box frame, 2 feet 5 inches by 4 feet 6 inches, $1\frac{3}{4}$ -inch jam, 6-inch center; one box frame, 2 feet 9 inches by 5 feet 2 inches, $1\frac{1}{4}$ -inch jamb; one skeleton window frame, 2 feet 7 inches by 5 feet 2 inches, $3\frac{3}{4}$ -inch seat.

After having taken all the windows proceed by taking the door sizes next. There may be an opening of 2 feet 10 inches by 6 feet 10 inches between the rough studs. This would mean a door of 2 feet 8 inches by 6 feet 8 inches. The stud, which may be 3 inches, would need a jamb of $4\frac{3}{4}$ inches. Whatever the rough opening is, make the door 2 inches less in size and the jamb $1\frac{3}{4}$ inches wider than the rough stud. However, in cases where plaster boards are used, this would be too wide, but in such case we would make the right allowance for the jamb by finding out the thickness of the wall finish. If an opening for a door should be irregular in width, as, for instance, 2 feet 9 inches, then it is a good plan to mark the studs with the correct size of the door which we intend to furnish, so that there will be no mistake made by the carpenter when placing the jambs.

When taking the size of closet doors be careful to make note of the fact, for in most cases closet doors are only $1\frac{1}{8}$ -inch thick, while the others will probably be $1\frac{3}{8}$ -inch. Also, very often the trim in a closet is different on the inside in cases where there is a cabinet head finish on the outside. Also measure the openings for switch-box doors, which are usually made the inside size of the box. After having taken the doors, proceed to measure up the baseboards or base, taking the closets separate, because in most cases they are different.

Next is the base blocks, if any are needed, which is not always the case. Then corner

beads, stating how long, for some corners will not allow of a regular 4-foot stock bead being used. Sometimes it happens that a corner is not at right angles, which must therefore be stated and the correct angle noted.

In most cases there is a plaster railing inclosing the staircase on the top floor. If this wall is 4 inches thick, then furnish a cap of $5\frac{3}{4}$ -inch wide, nosed on both edges, calculating a piece of molding the same kind as the base cap on each side of and under this nosed cap. These moldings should mitre into the base cap. Now measure the closets for shelving and pin rail.

Having taken all the data on this floor, take the steps and risers, nosing and strings for the stairs, which are usually the box kind; also wall rail. This would bring us to the second floor, with which we proceed in the same manner. It very often happens that this floor has different kinds of wood in the different rooms, the front room being oak or chesnut, the bedrooms cypress or pine, and the bathroom and toilet poplar. It is best to mark on the plans the various kinds of finish to be used in the different rooms, so that there is not so much chance to make a mistake; for a door which is to be made up of two different kinds of wood is expensive, as it has to be veneered and cannot very well be kept in stock. These are exceptional cases and should be measured up carefully.

On this floor there may also be a bay window, in which case take note of the width of space between the frames at the angles, for in many cases the regular trim is not wide enough and a special trim must be made for these angles. If a seat is to be put in this bay window, correct measurement must be taken of all angles, length and depth, so that the seat will fit when sent to the job.

It is often the case that a door leads onto a rear porch from this floor. Note must be made of this fact, because the door will only need trim on one side; also a threshold will be wanted. If this door has a transom above, take size of same, also width of bar, so that the trim on the inside will be made long enough. In the bathroom there will very likely be a medicine chest; take the rough opening size of this, also the depth.

The first floor is usually the hardest to measure up, for very often there is a colon-

nade which members into the staircase, and must therefore be measured very exact. Then there may be a paneled wainscot in the dining room; in which case the utmost care must be taken to get the figures just right, or there will be "something doing" when the paneling does not fit. A circular bay window is also one of the nightmares which often occurs on this floor. If this should have a paneled base or box seat, then your troubles are more than a few. However, be sure what you are about and go ahead.

In the kitchen there is the dresser, which sometimes has to fit into a certain space between the trim of two doors; this must be measured very correctly, also the height of the story taken. The range place trim and doors must not be forgotten.

The staircase, which is by no means the easiest part of the job, I usually reserve for the last. This necessitates the making of sketches in order to take down right so that the stair man may readily understand what is meant. Here it is very appropriate to impress the fact that whoever the man

that takes the data, he should be able to make a tolerably good sketch, both instrumental and free-hand, for often it is required of him to sketch the outlines of some ornamental work which has many curved lines and moldings and which must be duplicated exactly.

It is therefore evident that you cannot pick out a man at random from the mill employes and send him out to get data. Also, there is very great responsibility connected with the work, which is not always appreciated by the mill owner. If you have the right man, it is to your interest to pay him well; his path is not strewn with roses, for if anything goes wrong, the man who takes the measurements is blamed first.

The data should be explicit in every respect, so that the man who writes out the cutting list for the mill may understand it thoroughly without asking a lot of questions. It often happens that the measuring man will be out for several days in succession, and if the data is not explicit it will cause great delay in writing out the cutting list.

Carpentry on Fireproof Buildings

A. A. Stafford

IN taking up this work from a former article on steel construction, I wish to explain that I am not trying to show full detail of any building, just sectional parts, and how the work can be done substantially, and for the benefit of readers who wish to profit by it. Of course, for a man who knows it all and can't learn any more, this won't do any good. Figure 5 shows some reinforced concrete construction, starting top of piers in the ground. This work is practically nothing but form work, as it all has to be torn out after the concrete is in place. I have left out some of this section so that nearly all parts can be seen. Column box A shows how they are built up of plank, board or flooring, and cleated together with boards; and if it is a large column it must have clamps besides, all around about three feet apart. The corner boxes are only cut on two sides for beam box to set in. There should

be a pocket made in one side of the bottom of each column, so if anything gets down in, by removing the pocket, it can be taken out before the connecting is done. When all the column boxes are set in exact place and fastened there by ties and braces, then cut tops to level ceiling line, allowing enough longer to get distance from finish floor to finish ceiling. Establish beam lines, and cut out openings for beam boxes. This is the only exact way to do this as it is hard to get the boxes just the right length in the building, and set on uneven rough piers. If not started right there will be something the matter all the way up. Next build the beam boxes. Here is where you must look out for obstacles. Make the bottom just as wide as the beam will be, let the sides lap over. Sometimes, for the first one or two stories, the architect will specify brace beam, then the bottom of the form has to be cut short, and an angle of 45 degrees

put in as shown at D box A. Then when the reinforcing rods are put in the box, the ends are bent on circle and run over into the column box. This forms a solid brace in the concrete. A 2x4 or some timber must be run along the top side of beam box to carry the floor ends, whatever it may be. Some use plank as shown. When tile filling is used, the plank can have a few inches space between them this saves timber, and the concrete dries better. Some run the 4x4's the other way, and put on joists covered with matched flooring. Shore C shows how this work is held up. Shores should be placed about three to four feet apart, according to the load they must carry. Shore B shows how they are on beam boxes. Use a piece of 4x4 for corbel, braced with boards to shore. Uprights for clamp side of box and 2x4 spiked on side of corbel. This holds the lifting power of side braces when the pressure is in the box. These side clamps must come just to the 2x4 that carries the floor, then everything is held up solid. If a very heavy load, and it is thought necessary, put some extra pieces top of corbels. The braces top of corbel are 2x4's spiked in place. Don't let any of this work come in the way of floor. The floor must be just level on top with the beam boxes and columns. Shores can be driven sideways a little to make boxes level up and line up. See to it when putting on the braces.

The shores should all set on plank, and have one or two wedges under them, so they can be raised in case of settling, as at the end of 4x4 and dotted line, because they are bound to settle when the weight gets on them. If the ground is a little uneven, just tamp dirt under the plank till it all lays solid. If there is any print of any kind wanted in the columns or beams, they must be put in the boxes in course of construction.

The column clamps vary according to contractors. Some use iron special clamps. Some use 2x4's blocked apart, and drawn on column with iron rods, made up for the purpose. But this takes a lot of material, as there should be at least three clamps around each column. This means twelve double 2x4's and twelve rods. And the time is here when the man that don't take advantage of small costs loses out, as competition is some strong. Then, too,

on the other hand, some figure that one nail will hold anything, and they can get a boy to drive it, so they are bound to lose out.

A clamp as shown D 6, if properly made, will do the business. Use good solid 2x4, and cut them twenty inches longer than the width of box and twice 2x4, then nail on some short pieces of boards (either way) good and solid, on each and every 2x4. Set them edgeways to the box, and when necessary drive a wedge to tighten them.

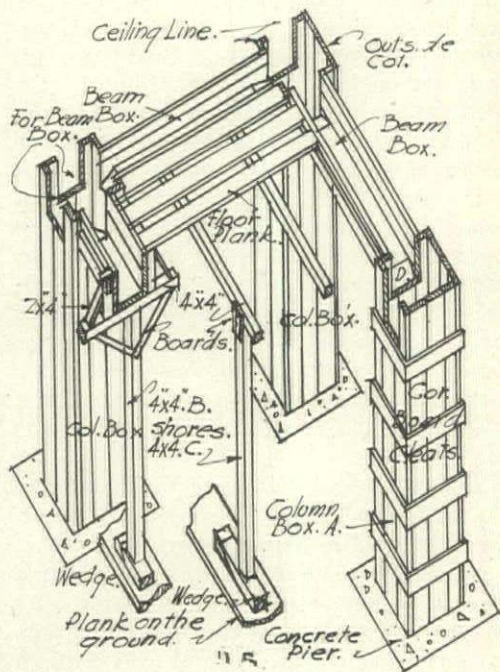


Figure 5.

When it comes to using them on smaller columns, put on an extra piece of board to fill the difference. The clamps can be used on octagon columns just the same, by nailing boards across the corners to hold the angle pieces. After the second floor concreting is done and dry, then all this form stuff can be taken out and made over for the next story. This is a practical base on this kind of work, but you must use judgment for small points on your own job.

All people are not crazy for low prices; the majority are willing to pay for quality.

Inflammable Paint Liquids

A. Ashmun Kelly

TAKING into consideration the danger in using highly inflammable liquids in painting or staining, and also their very limited value in that direction, it may well be worth considering whether it pays to use them, after all. There is not a use to which they are put that cannot be as well served with liquids of very much less danger. Take benzine, for instance, used in the place of the costlier liquid, turpentine, and of which vast quantities are used, not only by the painter, but by the paint maker. In a previous article I have described the different liquids used in painting, and under the head of benzine said: "Benzine is an active thinner of paints, and a great solvent of oils, but it possesses none of the best qualities of turpentine; it cannot take its place in painting. It acts on the oil so that the oil is removed, causing it to come to the top, whence it is removed, and consequently the paint has little or no binder left. Paint mixed with it is short of grain, it prevents paint from levelling out well under the brush, and it does not give the flat finish that turpentine gives; it makes a soft paint, and where white paint is thinned with it the result is a yellowing, while turpentine leaves a white, as well as flat, paint. As benzine will not mix with water, it is particularly bad in paint applied over a damp wood—and very much wood is far from being dry." I have changed the wording somewhat, but what I have given is the indictment against benzine as a thinner in paint, and yet its worst fault remains to be told, its inflammability. There is always danger in its use around a house. Recently I read of a terrible explosion where gasoline had been used to fumigate a cellar, by sprinkling it around, and when a woman went into the cellar, afterwards, she lighted a match, in order to see, and she saw a flash that almost wrecked the house. Now, gasoline is not used by the painter, because its evaporation is too great, not because it is very inflammable; it also is costlier than benzine.

Another highly inflammable liquid much

in use now in painting is benzole, and insurance people object to its use very much. At the same time it is a very useful liquid in many ways, only it needs to be used carefully, and even then there is danger to be apprehended. Benzole, benzol, coal tar naphtha, or solvent naphtha, which are its various names, is derived from bituminous coal, by distillation, or as a by-product of gas works, from gas tar. It is a water-white liquid, extremely volatile, and leaves no residue after evaporation. A perfect solvent for oils, gum resins, etc., in connection with acetone it forms the paint and varnish remover of commerce; it is also occasionally used in connection with turpentine for cutting damar gum. Added to paint mixtures containing rosin it prevents the granulation of that ingredient.

In priming paint for certain resinous woods benzole is useful in assisting penetration and the cutting of the gummy substance of the wood, so that the priming coat will hold fast. Also when painting a hard or glazed paint surface the addition of a little benzole to the paint will soften up the hard coat and allow the new paint to form an attachment. It thins paint or varnish easily. When mixed with paint it acts like turpentine, the paint working easily under the brush. It easily dissolves rosin, and is unaffected by cold. It easily mixes with turpentine and benzine and linseed oil. In price it is usually a little higher than heavy petroleum spirits, which are sold as turpentine substitutes. Benzole is also used in baking enamels, and enamel paints, the benzole being driven off by the heat.

Evaporation tests:

Pure benzine	10	minutes
100 per cent. benzole.....	13½	minutes
50 per cent. benzole.....	23	minutes
16 per cent. benzol or solvent naphtha.....	107	minutes
Turpentine	142	minutes

But benzine has a higher rate of evaporation than any other paint thinner, higher than that of benzole, highly inflammable as the latter is. The matter of evaporation

may not interest us just now, and it is also a subject not perfectly understood, but we know that those liquids that we deal with in painting are dangerous in proportion to their rate of rapid evaporation.

Turpentine substitutes are usually made from a heavy petroleum distillate; it is something between benzine and kerosene oil, but it is not as volatile as benzine is. By adding a certain small percentage of wood turpentine to it, and perhaps some rosin spirit or pine oil, a very clever imitation of the true turpentine spirits can be had; sometimes benzol is added to it. Such compositions are of course more inflammable than pure turpentine spirits, and hence more dangerous.

Kerosene oil is very largely used in paints and particularly in the west and south. It is absolutely without merit in paint. Some painters claim certain merits for it, but it is certain that they have not given their experiments time enough to lead them to any correct conclusions. Any paint applied over paint that has been mixed with coal oil or kerosene oil will surely peel. And this no matter how small a proportion of kerosene may have been used in the paint. Kerosene oil is of course an inflammable liquid. In fact all liquids used by the painter other than oil and turpentine are dangerous, and liable to cause fires, besides other damage that is not to be overlooked.

The Marking of Oblique Cuts

Edward Hardy

FIGURE 159 is a view of a half cone resting on its triangular surface. Select any point B on the edge of the base and join it to the apex A and the center O. Let AB represent the line of contact of a

inclination to the triangular surface or the horizontal plane. But the angles $\angle ABO$ and $\angle BAO$ are respectively equal to the angles $\angle OCA$ and $\angle CAO$. Therefore, if any line be drawn from the edge of the base to

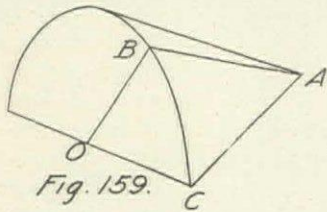


Fig. 159.

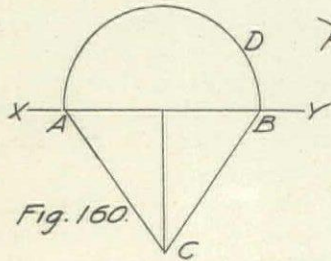


Fig. 160.

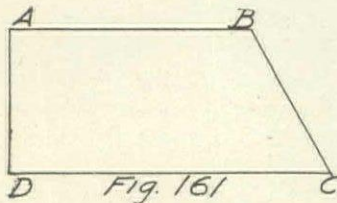


Fig. 161.

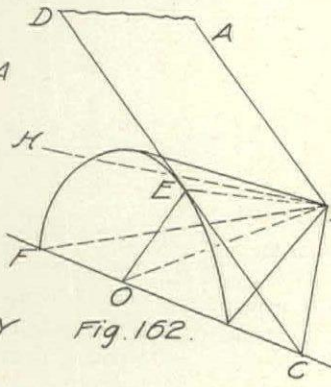


Fig. 162.

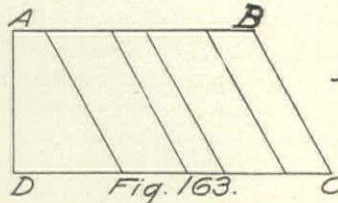


Fig. 163.

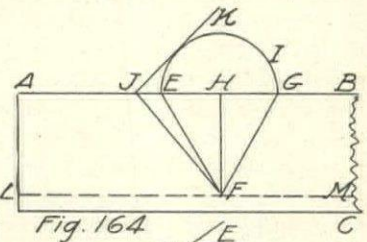


Fig. 164.

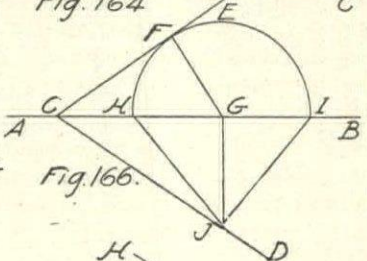


Fig. 166.

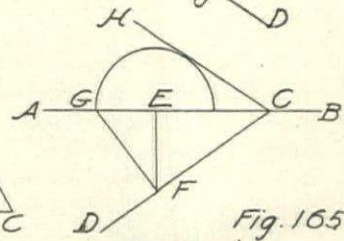


Fig. 165.

plane surface with the cone. The angle $\angle ABO$ represents the inclination of the breadth of the surface to the base or the vertical plane, and the angle $\angle BAO$ its in-

the apex to represent the line of contact of a plane surface with the cone, the angle $\angle OCA$ will give the inclination of the breadth of that surface to the vertical plane, and

the angle $\angle CAO$ its inclination to the horizontal plane.

ABC (Fig. 160) is the plan of a half cone resting on its triangular surface, and ADB is its elevation. The axis of the cone lies in the triangular surface, so its true length and position are represented by CE . The angle $\angle EBC$ (or $\angle EAC$) gives the base angle of the cone. It also gives the inclination to the vertical plane of any plane resting against the inclined surface of the cone. The inclination of the above surface to the ground plane is given by the angle $\angle BCE$ (or $\angle ACE$). $\angle BCE$ is one-half of the angle at the apex of the cone. It is also the complement of the base angle.

Take a piece of cardboard whose width is equal to the slant height of the half cone. Cut obliquely across one end of it so as to obtain a shape similar to that represented by $ABCD$ (Fig. 161).

Set the half cone with its triangular face lying on the table. Place the piece of cardboard so that the point B touches the apex of the cone and the point C rests on the table at a point in a straight line with the base of the cone. Fig. 162 is a view showing how they should be fixed. In the diagram the piece of cardboard is represented as being transparent. $ABCD$ is now an oblique plane, and its edge CD touches the base of the cone at the point E . The plane rests on the cone along the line EB . EB represents both the slant height of the cone and the breadth of the plane. The inclination of the breadth of the plane is the same as that of the line EB , and it has already been shown that if any line represent the point of contact of a plane surface with a cone, the inclination of the surface to the vertical plane is given by the base angle of the cone, and its inclination to the horizontal plane by half the angle at the apex.

The base of the half cone is vertical, and E , a point on its edge, is vertically above the line FG . The point C lies on FG . Since the straight line FG contains the plan of two points in the straight line DC , it will, if sufficiently long, contain the plan of the whole line. AB and DC , being parallel, AB would be represented in plan by a line drawn from B parallel to FG . OB represents the axis of the cone, and it is at right angles to FG . Since it extends perpen-

dicularly across the space FG and BH , it gives the width the plane occupies in plan.

Any oblique plane can be supported on a half cone in a similar manner. The inclination of the breadth of the plane will determine the angles of the cone, and the breadth of the plane will determine its slant height. A perpendicular from the apex to the base of the triangle, representing the plan of the half cone, will give the plan width of the plane.

Referring again to the model (Fig. 162), it will be found that the edge CD lies in the same vertical plane as the base of the cone. CD extends in the direction of the length of the plane, and is inclined to the table. The angle $\angle FCD$ therefore gives the pitch of the plane in the direction of its length. CD also touches the circular base. Hence the inclination of the length of an oblique plane is tangential to the base of the half cone which supports the plane. BC shows where the oblique surface $ABCD$ meets the horizontal surface of the table, or the intersection of the oblique and horizontal planes. BC also gives the position of a horizontal line across an oblique surface, and is known as "the horizontal trace." This line is of primary importance in the *direct method* of developing cuts for oblique surfaces. On the piece of cardboard (Fig. 162) draw a number of lines parallel to BC , as shown in Fig. 163, and set it up in position as before. It will be seen that these lines are now parallel to the ground plane. Each is a horizontal trace. If one horizontal trace be determined for an oblique plane, by drawing a line parallel to it, another horizontal trace may be obtained in any position on the same surface.

Reference to the model will show that one end of the trace BC lies on the ground plane at the apex of the half cone, and the other lies on it at the point where the diameter of the semicircle, being produced, intercepts a tangent to the semicircle showing the inclination of the length of the surface. A line joining these two points gives the horizontal trace.

Let $ABCD$ (Fig. 164) represent a surface which is to be placed so that both its length and breadth are inclined to the horizontal plane, the former being inclined at an angle of 45° and the latter at an angle

of 30° . It is required to find the plan width and the horizontal trace.

Since the breadth of the surface is to be inclined at an angle of 30° , the base angle of the supporting half cone will be 60° . With a portion of one of the long edges of the surface as a base, construct a triangle whose base angles are 60° , and whose sides are equal to the width of the surface. EFG is the plan of the supporting half cone. The perpendicular FH gives both the plan width and the centre of the base. With H as a centre, and HE as the radius, describe the semicircle EIG . This gives the elevation of the base of the half cone. Set up JK at an angle of 45° with AB and tangential to the semicircle. Join FJ . The space AB to LM gives the plan width, and JF is the horizontal trace.

If the horizontal trace and one of the inclinations of an oblique plane be known, the other inclination can be found. Suppose the position of the horizontal trace and the inclination of the breadth of the plane to be given

Let AB (Fig. 165) be the edge of an oblique plane, and CD the direction of the horizontal trace. At right angles to AB , and from any point in it, draw EF to intercept CD at F . Make the angle EFG equal to the inclination of the breadth of the surface, and with centre E , and radius EG , describe a semicircle. From C draw the tangent CH . The angle ECH represents the pitch of the length of the plane.

Next, suppose the horizontal trace and the inclination of the length of the plane to be known. Again, let AB and CD (Fig. 166) represent the edge of the plane and the position of the horizontal trace respectively. From C set up CE , the inclination of the length of the plane. Draw any line FG perpendicular to CE , and let it cut AB at G . With centre G , and radius GF , describe the semicircle HFI . At right angles to AB draw GJ to intercept CD at J . Join HJ and IJ . Each of the angles GJH and GJI represent the pitch of the breadth of the plane.

Windows and French Sash

J. Grant Robinson, Architect

IT is useless to go into an elaborate detail on this subject, as a carpenter is seldom called upon to make a sash by hand.

Everything is done at the mill, but enough detail is here given to make it clear to the young mechanic and make plain the general construction.

Casement sash swinging in should not be used on the exposed side of a house unless protected by a wide piazza or other roof, but on account of a finished appearance and decorating effect, are preferable to swinging out sash.

Figure 1 is a detail of an old English method of making a casement or French sash. It is seldom used in this country. The writer has used it but once. These sash do not open and close separately, but both at the same time, so as to shut very tight. Figures 2 and 3 show a general detail, either French or casement sash, and unless on account of hardware or a special design by the architect, the stiles and rails can be stock pattern.

Care must be taken to make the stiles to suit the hardware, whether of special design or not. The bottom rails should be made as wide as can be, as practically the strength and stiffness depends on it. A casement 6' high should have not less than 6" bottom rail where sash enter rooms. The bottom rail should match that of the doors in some room, if possible.

The writer, after years of experience and experimenting with many kinds of arrangements to make French sash weather proof at bottom, believes that the simple method shown at figure 2 is the most effective. It should be made to fit tight at the point w on sub-sill and then the sill and drip should be thoroughly waxed.

The rubber should be inserted as shown. This rubber stops an air draught, which sucks water through under the drip in most cases. By carrying out the rubber all around the sash and meeting stiles, a good weather tight job can be made, if done by a careful mechanic. Sketches figure 1A and figure 3A are a simple layout often

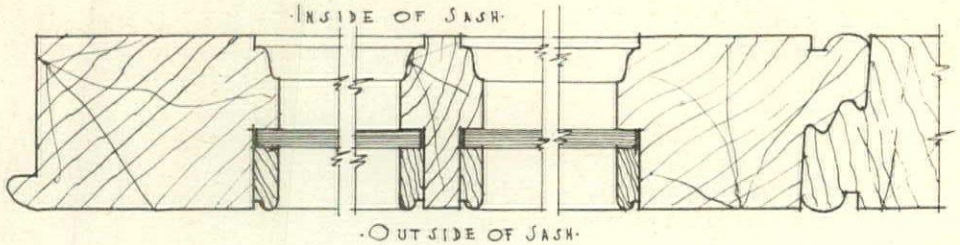


FIG. 1.

used, but the design is a matter of taste of the architect or owner.

Figures 4 and 5 show detail of check rail or pulley hung sash as made generally in the East and Canada as far west as the Rocky Mountains. The dotted lines show how the check rail is dovetailed onto stiles. The stiles and rails for 1 to 8 lights are generally 2" to glass with 1/4" rabbet for 21 oz. glass and 3/8" rabbet for plate glass. The bottom rail, where plate is used, is made wider or narrower to suit an even size glass, generally bottom rails are about 4' to 4 1/2" wide. Note the methods and customs vary widely in different sections, so hard and fast details cannot be given. Work to local custom.

The muntins of sash up to eight lights are 3/4" and rabbetted 1/4". For twelve to twenty-four lights, stiles and rails are 1 3/4" to glass, bottom rail 3 1/2", and rabbetted 3/8" for glass. Muntins are 3/8", bars 5/8", rabbetted 3/8" for glass. The bars are used the shortest way of sash and muntins coped between.

Figures 6 and 7 are details of pulley hung sash as made on the Pacific Coast, England, Africa, and Australia. The sash are mortised and tenoned together at the four corners. See dotted lines at check rails. The stile of the top sash extends below check rail and shaped as shown. This is to give plenty of wood below the tenon. The muntins are always 3/4" or

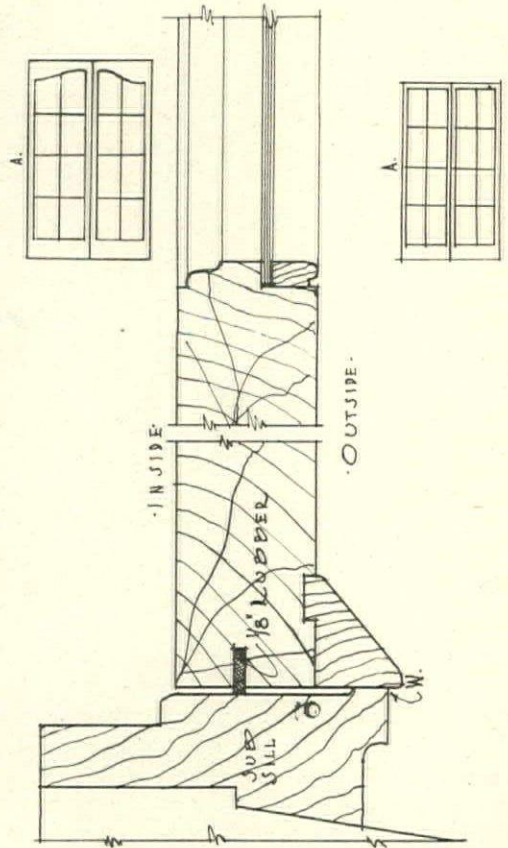


FIG. 2.

more, and 1/4" rabbet except for plate, which is usually 7/8".

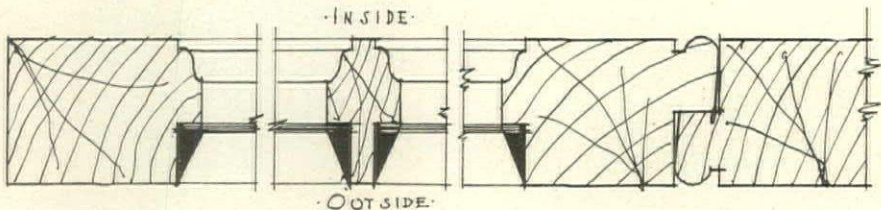
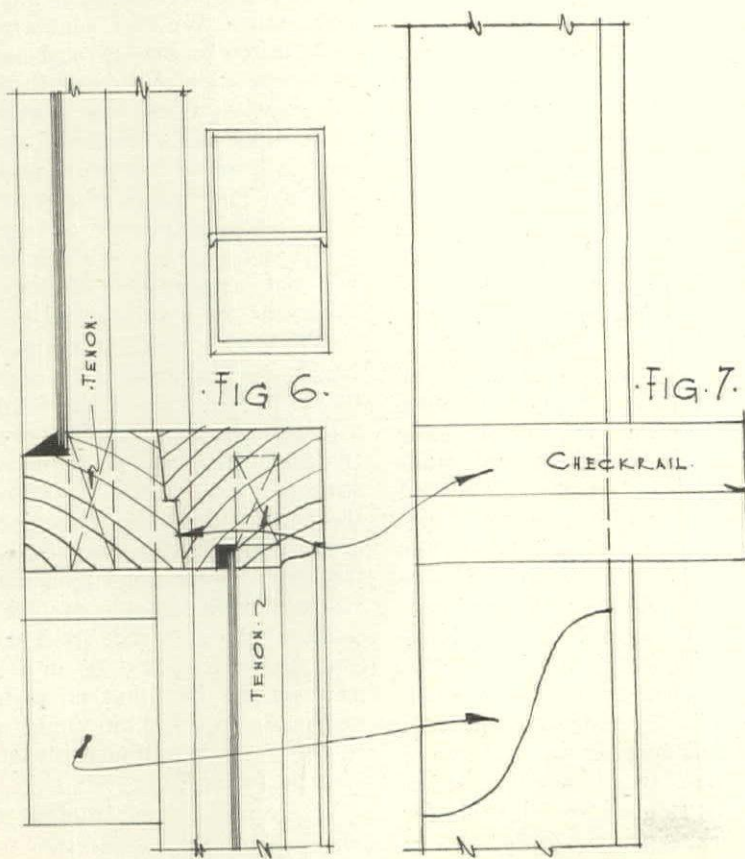
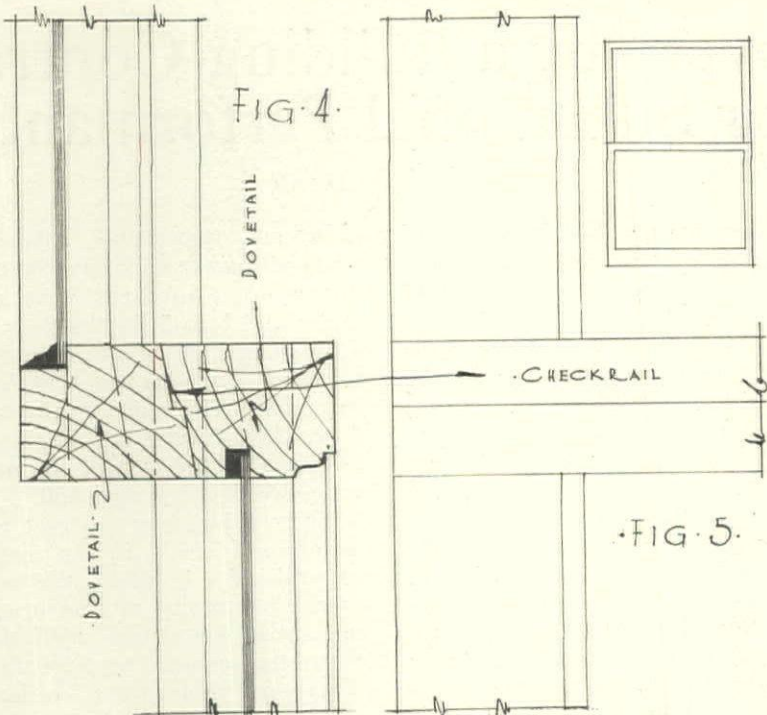


FIG. 3.



Recovery by a Building Contractor for Substantial Performance

W. J. Stanton

THESE are many cases in courts of last resort passing upon what constitutes substantial performance of building contracts. Thus, the fact that the roof of a rear addition to a house was built five inches lower than called for in the plans was held not such a deviation as would prevent the contractor from recovering, where it was shown that it did not affect the usefulness or symmetrical appearance of the house. Where a contract required the contractor to build a wall four and one-half feet high, his failure to build it to that height in some portions did not prevent him from recovering on the actual value of the wall as completed. Another contract required the construction of a saw mill fifty feet by one hundred and fifty feet, and it was held that the construction of one seventy-eight feet by one hundred feet was not a substantial compliance, even though it was shown that one of those dimensions cost more and was of greater value and better adapted to the purposes to be accomplished.

Where a building contract required the placing of girders of a certain length in a certain position and the placing of a wooden partition on a brick wall in the basement, a failure to do so was such a structural defect affecting the solidity of the building as would defeat an action to recover for a substantial performance. Where a contract calls for "No. 1 rustic and the best quality of joist and studding," the use of No. 2 rustic and second quality of joist and studding is not a substantial performance. Likewise where the contract required the furnishing of only "5/8 beaded yellow pine first standard ceiling" and first and second grade "Long leaf yellow pine flooring, not over 3 1/4 inches wide," the furnishings of a much less expensive and altogether different kind of pine ceiling and flooring was not a substantial compliance, even though the lumber furnished was as good and durable for that specific work, since the difference in

finish and appearance between the two kinds of lumber may have been important. But where clapboards were used in the gables and boards in the floor which were wider than those specified in the contract, it was held to constitute a substantial performance where the usefulness and value of the house were not impaired and the difference in the cost of the material substituted did not exceed \$50.

Where a building contract required the use of hard bricks in the construction of the walls of a building, the use of a considerable quantity of soft bricks is not a substantial compliance with the contract. Where the contract requires the contractor to make a "water-tight" cellar by pursuing a certain method, the making of a "water drained" cellar is not a substantial compliance. Where a contract required the installation of screens and hardware made of bronze wire and doors fitted with Laramie checks, it was not a substantial compliance to use "bronzed" steel wire and merely bronzed hardware and no Laramie checks. The failure of a contractor to put three coats of plaster on a clothes closet wall according to the terms of his contract will not, as a matter of law, defeat a recovery as for a substantial performance.

Where the contract requires the buildings to be plastered and a certain chimney flue to be constructed, the failure to plaster a large room in the basement and to build the flue which was to be constructed constitutes a failure to substantially perform the contract. Where the contract for the decoration of a storeroom required the contractor to cover wood partitions with canvas to make a suitable surface to work on, and that the materials used should be first class and the work done in a workmanlike manner, the fact that no suitable surface was made to work on would not preclude a recovery where the contract was otherwise performed.

Where under a contract to repair an old house and build an addition to it, no part

of the second coat of paint upon the new part had been put on, two doors were not hung, no lock nor fastenings on the front door and windows, and the work bench of carpenters and paint which was still to be used were still in the house, there was no such substantial performance as would allow a recovery after the destruction of the house by fire. Under a contract for the painting, varnishing and graining of certain buildings, the fact that some small places in the buildings were not properly grained and finished would not defeat an action for recovery as for a substantial performance, where the cost of finishing according to contract would not cost to exceed five dollars.

The fact that some brickwork was unfinished and the debris was not removed from some of the floors, the total cost of doing which would not exceed three dollars was held not to prevent recovery as the contract was substantially performed. A contract to construct a barn cannot be said, as a matter of law, not to have been substantially performed because the large doors have not been hung.

The doctrine of substantial performance does not apply where the variations from the terms of the contract are so substantial that an allowance out of the contract price for damages would not give the owner substantially what he contracted for. In many cases in determining whether or not the contract has been substantially performed, a controlling importance has been given to

the cost of remedying the omissions, defects and deviations as compared with the contract price of the whole work in preference to a consideration of the character of them. Thus, where the contract price was \$3,400 and the cost of completing the contract was \$267 it was held no substantial performance where it will cost \$350 to complete the house according to contract. So, also where the contract price was \$3,200 the value of unfinished work was \$300 it was held to be an insufficient showing to constitute a substantial performance. In another case where the contract price was \$3,100 and the cost of performing the unfinished work was \$314, it was held not a substantial performance. In another case the contract price was \$2,100 but the omissions on the part of the contractor amounted to ten per cent. of the contract price, and it was held not to amount to a substantial performance.

The question of substantial performance sometimes arises as to the time of the completion of the work. Thus, delivery of brick on a contract requiring delivery not later than a day named, on the day following such day at 6:25 a. m. is substantial compliance with the contract. Where a building was to be completed by a specified day or render the contractor liable to certain penalties, it was held to be substantially completed where all that remained to be performed was the removal of external rubbish, the remedying of a slight defect in the cellar and a few other minor defects caused by the weather conditions.

Changing Your Location

F. Ford

The following letter received at the offices of the NATIONAL BUILDER, speaks for itself:

Camden, N. J.

Dear Sir:

I am very desirous of making a change in location. Therefore, if you will send me the names of some of the places you had in mind, when writing of the opportunities for carpenter contractors below Mason & Dixon's line, I would thank you very much, as I do not know of any location at present that does not have a larger

number of carpenters than is necessary.

I am, Very respectfully yours,

H. N.

Other letters of the same character have been received by the NATIONAL BUILDER, and it is deemed best to answer all such inquiries in this general article, rather than to give a separate answer to each inquiry.

The writer spent several months in the South last winter, principally in Georgia and Florida. He met many Northern contractors who had done well down there. He

also met a good many who had made a mess of it. He saw places that looked like good openings, but that was a year ago. They may not be the same now. More carpenters may have moved to them. Therefore at this time it would be unwise to direct anyone to any particular place, as a man might spend money and time to go there and be desperately disappointed after all.

Undoubtedly there are good openings for contractors in the South, but no man should make a permanent move there till he has thoroughly considered every point involved in such a move. If a man thinks he would like to locate in the South, the only safe thing to do is to go down there and work as a journeyman, foreman or superintendent, for at least a year. Two years would be better. At the end of that time he will know if he wants to make a permanent change. There are thousands of Northern people in the South who curse the day they ever settled there. That is because they went with their eyes shut, knowing nothing of climate or conditions. Usually these people have been bitten by the land-sharks, who are man-eaters, every one of them. There are thousands of other Northern people in the South who are happy, prosperous and contented. These people in nearly every case knew exactly what they were doing before they made a permanent move.

What is prompting you to change your location? Is it because you have never succeeded anywhere you have yet been? In that case, you will certainly fail down South, and you might just as well fail here and save railroad fare. It is because the winters are so cold and long in the North? Don't forget that the summers are fearfully long and trying in the Southland, and that there is more or less malaria all through it. The Southern people would give anything for the tonic of our winters, though they would no doubt find a continuous residence here too tonic. For healthy people the Northern climate is undoubtedly better than that of the South.

The experience of the writer is that the most contented Northerners in the South are those whose health demands a milder climate. This they find in the Southland and regained health makes them happy and

contented, even though they miss a good many things they have been accustomed to at home.

One cannot have everything. If your health is such that a milder climate is necessary, there is every reason to believe that you will be contented where your health is better. But be sure that you are going to a climate that will agree with you. The writer, whose health has been indifferent for several years, found that the climate of Florida did not agree with him at all. It is far too humid, relaxing and enervating for him, and he was mighty glad to get out of it. But he found people from every State in the Union who owed a new lease of life to the same climate. Curiously enough the most ardent boosters of the Florida climate were people from California, with whom the much-advertised Californian climate did not happen to agree. In general the climate of Florida, of the Gulf and of the South Atlantic Coast, is good for bronchitis, inflammatory rheumatism, heart trouble, some forms of lung trouble and some nervous diseases.

It is bad for chronic articular rheumatism, malaria, bilious troubles, and for some forms of nervous disease. The climate is soft, humid and pleasant, but languorous and enervating. Northerners find that they need to take a trip back to the North every two or three years to tone up their systems.

Of course, the only way to find out if a given climate is suitable or desirable is for one to go there and stay awhile. This stay should be for at least twelve months so as to familiarize one with all seasons. If the contractor works as journeyman or foreman around the locality of his choice, he can not only learn the climate, but he can keep his eye peeled for a suitable business opening. He will also accustom himself to the local conditions and customs. This is the wisest thing to do. It would be very unwise for a man to move his family till he becomes thoroughly posted all along the line. And he must see with his own eyes and not take any other man's word for it.

If you go South, don't discuss the war down there. Mum's the word. And if you go South or West, or indeed anywhere, beware of the land-sharks.

Decrease in Building

Building construction in the United States for September shows a decrease of 35 per cent. Permits were taken out in seventy-nine leading cities in September for the construction of 17,301 buildings involving a total expenditure of \$43,377,847, according to official reports to CONSTRUCTION NEWS, as against 21,543 buildings involving \$66,726,944, a decrease of 4,242 buildings and \$23,349,097 or 35 per cent. There were gains in nineteen cities and decreases in 59 cities. The figures in detail are as follows:

Cities.	—1914—		—1913—	
	No. of Bldgs.	Estimated Cost.	No. of Bldgs.	Estimated Cost.
New York (Boros Man. and Bronx)	267	\$ 6,348,851	443	\$ 6,320,496
Chicago	709	4,925,900	930	7,858,920
Brooklyn	897	3,522,290	935	2,405,750
St. Paul	157	2,811,936	211	910,908
Boston and vicinity	341	2,604,000	456	5,237,000
Cleveland	1,078	2,132,979	1,065	1,949,545
Philadelphia	1,208	1,811,305	1,302	4,363,955
Detroit	558	1,547,235	856	2,056,855
Los Angeles	779	1,106,064	1,387	1,748,665
Minneapolis	481	881,275	608	1,449,650
Pittsburgh	293	880,649	238	1,434,790
San Francisco	524	830,081	386	2,273,723
Buffalo	316	761,000	326	821,000
Rochester	258	666,554	279	843,226
Cincinnati	1,200	665,608	993	868,576
St. Louis	753	651,489	785	1,180,809
Kansas City, Mo.	238	565,035	309	676,695
Seattle	820	556,560	939	692,885
Columbus	199	491,725	237	473,195
New Bedford	80	462,225	126	510,742
New Haven	74	431,610	94	243,880
Grand Rapids, Mich.	150	427,624	150	1,573,350
Indianapolis	466	411,628	551	675,504
Baltimore	314	390,811	377	808,237
Toledo	203	360,358	222	672,489
Bridgeport	95	314,890	79	224,323
Oakland	334	354,562	354	456,424
Scranton	71	313,218	53	71,420
Omaha	74	312,360	97	414,580
Portland, Ore.	445	309,140	667	1,621,005
Akron	133	286,375	226	339,645
Albany	291	267,325	1,262	4,995,375
Cedar Rapids, Ia.	42	264,000	43	258,000
Syracuse	169	262,325	441	1,442,703
Worcester	116	262,260	142	404,619
Springfield, Mass.	123	255,016	108	232,025
Erie	122	238,240	161	288,956
Newark	154	231,660	208	561,526
Atlanta	245	170,804	309	384,723
Birmingham	162,315	...	242,099
New Orleans	159,277	...	186,769
Bayonne	17	152,766	22	46,950
Dallas	74	140,269	165	469,925
Springfield, Ill.	42	139,230	28	52,385
Richmond, Va.	130	136,799	110	122,361
Peoria	47	136,750	47	142,245
Pasadena	158	134,954	170	140,803
Memphis	163	132,169	273	288,355
San Diego	177	131,541	264	352,660
Fort Wayne	53	122,860	89	278,355
Davenport	53	108,957	33	79,250
Savannah	48	99,360	63	184,985
Berkeley	71	94,500	87	144,000

Lincoln	37	93,650	44	101,650
Tacoma	133	86,826	194	157,848
Sioux City	38	84,050	59	100,085
Wilkes-Barre	118	84,030	53	133,053
Tampa	128	80,550	126	53,055
Nashville	56	77,505	39	49,390
Chattanooga	217	77,387	187	50,120
East St. Louis	41	74,515	62	124,673
Paterson	78	72,783	49	54,215
Elizabeth	27	72,309	52	182,000
Troy	69	71,104	301	1,253,950
Altoona	57	62,531	74	74,551
Lawrence	15	58,250	15	64,600
Brockton	39	57,514	50	63,245
Reading	42	47,150	27	69,025
Dayton	55	42,785	102	107,955
South Bend	36	42,100	41	60,028
Topeka	37	41,575	41	115,005
Spokane	66	40,690	79	678,715
Colorado Springs	31	28,935	38	38,405
Charlotte, N. C.	14	28,000	26	292,937
San Jose	53	27,148	36	37,373
St. Joseph	65	26,172	55	77,120
Portland, Me.	22	25,020	32	179,000
Passaic	21	20,860	38	51,970
Hoboken	16	15,892	16	25,665
Totals	17,301	\$43,377,847	21,543	\$66,726,944

This is the direct result of the war in Europe. It is the most significant decrease in a long time and it is thought for this reason that the falling off may be of brief duration. There are some gratifying features of the report, notably improvement in building construction in New York City. New York City has been showing large decreases for a long time and the fact that there was no falling off during the month just passed is an indication of a more satisfactory condition in that city. Building in Brooklyn is extremely active with a gain of 46 per cent; St. Paul had a gain of 208; Cleveland, 14; Buffalo, 7; Columbus, 4; New Haven, 77; Bridgeport, 28; Scranton, 308; Cedar Rapids, Iowa, 2; Springfield, Mass., 9; Bayonne, N. J., 225; Springfield, Ill., 165; Richmond, Va., 12; Davenport, 37; Tampa, 52; Nashville, 57; Chattanooga, 54; Paterson, 34; Altoona, 16.

Chicago, which led the list of large cities with an increase in August, shows a decrease of 37 per cent in September. Other cities in which there was a falling off include Boston, 50 per cent; Philadelphia, 58; Detroit, 24; Los Angeles, 36; Minneapolis, 39; Pittsburgh, 38; San Francisco, 63; Rochester, 21; Cincinnati, 23; St. Louis, 45; Kansas City, 16; Seattle, 19; New Bedford, 9; Grand Rapids, Mich., 72; Indianapolis, 39; Baltimore, 51; Toledo, 46; Oakland, Cal., 27; Omaha, 25; Portland, Ore., 81; Akron, 27; Albany, 95;

Syracuse, 82; Worcester, 35; Erie, 17; Newark, 58; Atlanta, 55; Birmingham, 33; New Orleans, 14; Dallas, 70; Peoria, 4; Pasadena, 4; Memphis, 54; San Diego, 62; Fort Wayne, 56; Savannah, 46; Berkeley, Cal., 35; Lincoln, 7; Tacoma, 45; Sioux City, 16; Wilkes Barre, 37; East St. Louis, 40; Elizabeth, 60; Troy, 90; Lawrence, 9; Brockton, 9; Reading, 31; Dayton, 60; South Bend, 33; Topeka, 63; Spokane, 94;

Colorado Springs, 24; Charlotte, 90; San Jose, 21; St. Joseph, 66; Portland, Maine, 86; Passaic, 59; Hoboken, 37.

Affairs in this country seem to be adapting themselves to the war, and it would not be surprising to see probably a material revival in construction within a very short time. There is no doubt that the interest rates will soon be much lower and this will have a material influence on building construction.

Architectural Drawing Lessons

Eighteenth Paper

IT might be well to state that architectural drawings are drawn to scale; that is, not full size, but to a size usually $\frac{1}{4}$ inch to the foot, though in some cases $\frac{1}{8}$ inch to the foot is used. In laying out a plan it is necessary to know the sizes used, so as to get all parts in proportion, and by a little observation on the part of the draftsman many dimensions may be found to aid in the work. It might be a good idea to jot down the various scales made use of. To the beginners, in the architectural drawing

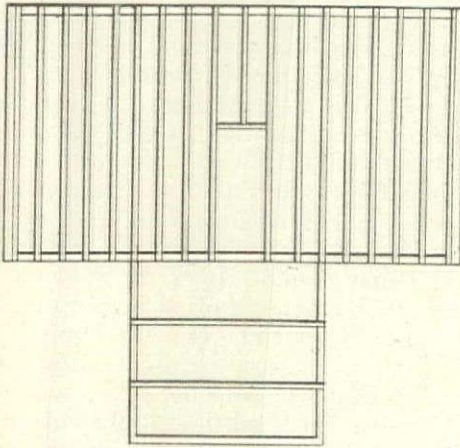


Figure 127.

as in all others, there appears a "boo-boo man" in the shape of lack of knowledge as to sizes of various objects. These objects are so common and in such near relation to our everyday life that it is not hard to realize their shapes from the names given. No one, we might say, who does not know what a door or window is, and there is a large number of objects that are not so common, but which are easily understood.

A skeleton plan of a naked partition or wall, Fig. 127, and the foundation of a porch is seen projecting on one side. The studding, and corner posts are shown, also

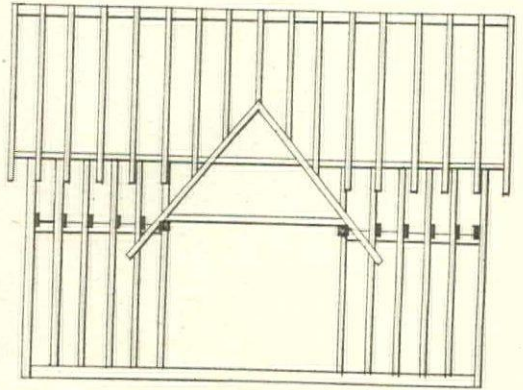


Figure 128.

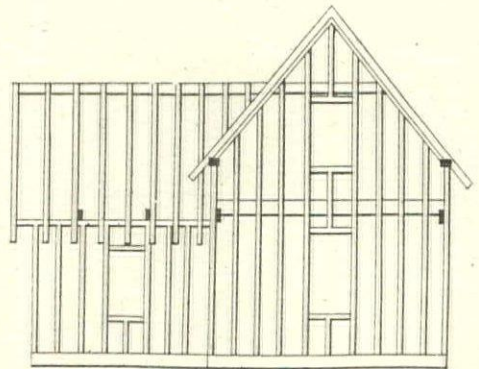


Figure 129.

an opening for a door. This is for a cheap balloon frame cottage, and this is the proper method of showing the scantling, each one being seen with a thick line and a light line; note this, as it is important.

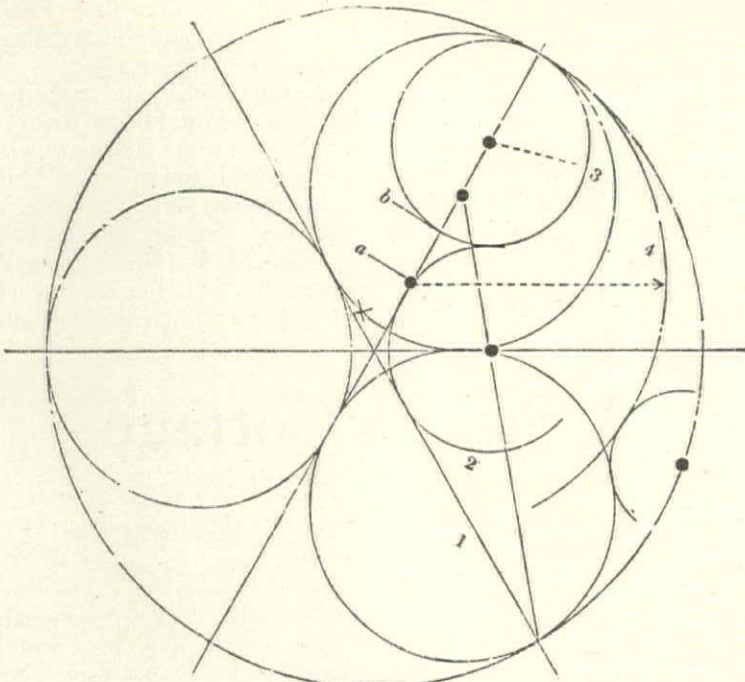


Figure 130.

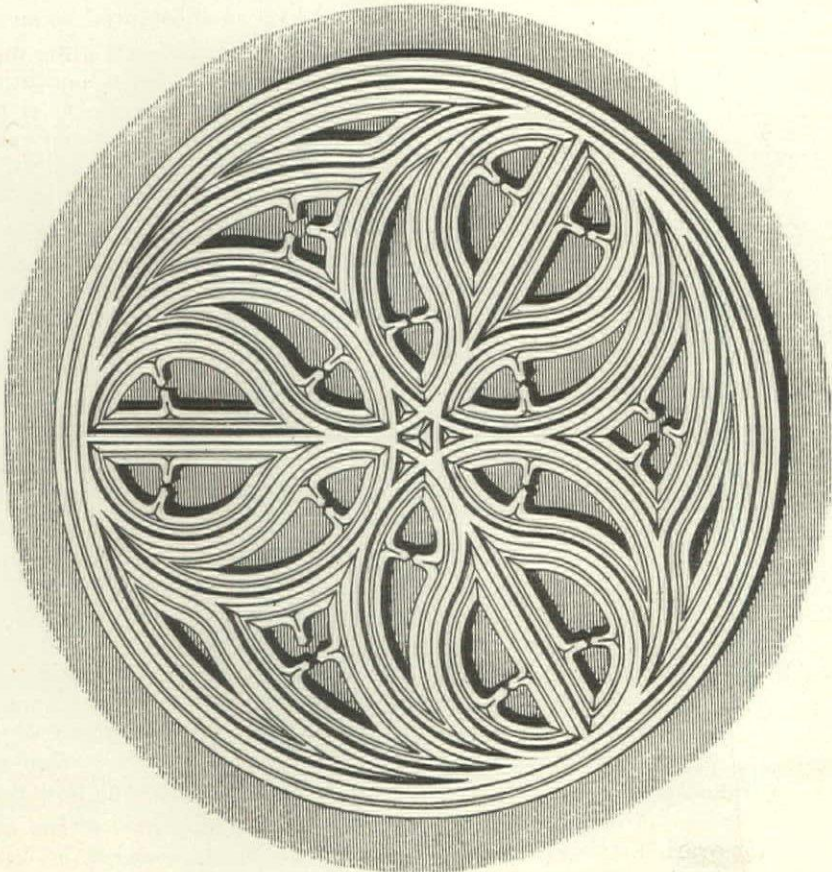


Figure 131.

Fig. 128 shows the front wall and rafters of a small cottage, house or stable. The ends of the joists are also shown, and the gable over the entrance, or porch, is also shown. It will be seen the rafters run over both ends of the building.

At Fig. 128 we show a gable on one end of a balloon structure. The gable projects from the side of the main building, and exhibits openings for windows, also view of gable and rafters.

A more intricate piece of work is shown in the development of the next two, Figs.

130 and 131. The first, Fig. 130, is a diagram and is made preparatory to finishing Fig. 131. The student is urged to copy Fig. 130 exactly, and marking off the black dots as shown in the diagrams, for these are the centers from which Fig. 131 is drawn and completed. The finishing of this drawing will entail considerable labor, and some thought, but the whole operation is pleasing and interesting, besides being instructive. Later on, we will have more of this work to treat our readers with.

(To be continued.)

A Stucco Cottage

Jas. Casey

NEAT, detached residences, with just accommodation enough and no more, to meet the requirements of small families of moderate means, are in demand all over the United States. The house here given is a specimen of the kind of thing that finds favor in Morris, Illinois.

The cottage is, substantially, a two-story

covered. Let here be noted that this double-overhang, in all about 16' 0" is what secures the deep roof and the extra wide gable ends; the purposes and merits of which will be explained when we come to consider the second-floor plan. The roof overhang above the front porch is supported by two substantial square piers.

Through the roof extending out over the porch in this manner an additional room is made in the second story, at practically no expense, as the same roof necessary to cover the porch extends up to meet the roof of the main portion of the house.

This building would generally be called a cottage, and might even be classed as a story and a half cottage. Just why it should be so called is not readily apparent except through the roof sloping down to the low eaves at front and rear. All the rooms on the second floor are the full height as to ceilings and although a portion of the floor space is lost in the closets the extra space over the porches more than makes up for it.

From a purely aesthetic viewpoint, the house is a story and a half. The owner probably prefers to call it two stories, both from a rental standpoint and as an indication of its real value. There can be no question but that there is economy in the entire arrangement, so those who want a cozy appearance are suited, while those who must have the rooms will find them.

The external appearance has also much to do with the popularity of the house. Comfort may be obtained in a plain box-



A Stucco Cottage. H. A. Taylor, Builder.

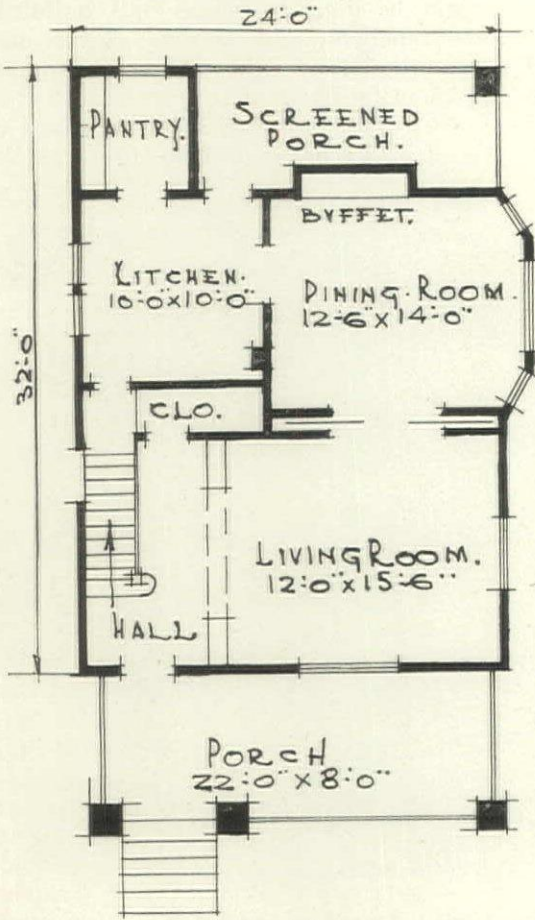
and basement affair. It stands in its own grounds and is lighted from all sides.

The first floor is a parallelogram, 24' 0" wide and 32' 0" deep. The second floor has a square body, with extensions forward and rearward, due to the wide dormers shown in the elevations.

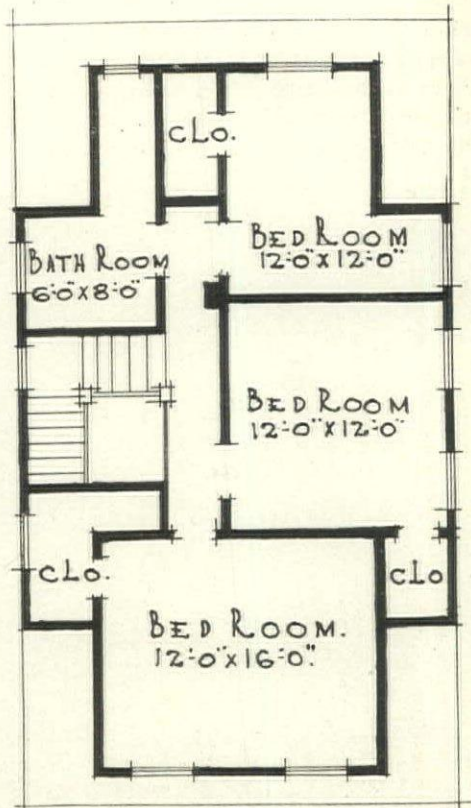
The main entrance is through a porch extending the entire width of the building, and covered by the overhanging of the roof. There is another porch in the rear similarly

like house and appearance may cover a poorly arranged plan. In this case, the exterior walls are finished in stucco, or pebble-dash in which an unusual method is followed to secure the desired finish. The surface is prepared similar to the ordinary stucco and at the proper time a surfacing

along the lines of planning, construction, decoration, furnishing, etc., has so well been carried out that the average owner knows exactly what he wants, and the modern house is generally a very complete home. In this case every modern convenience is provided, all the trim is hard-



First Floor Plan.



Second Floor Plan.

of crushed stone, marble chips or other material is rolled or pushed into the surface. This leaves the facets of the chips free from cement or mortar, and an even distribution of the material is readily provided.

The method allows a great variety of effects to be obtained, through the use of different colored stone, in various patterns. The wearing quality of this kind of a wall should be extremely satisfactory, in fact, equal to the stone used. For this house, crushed Joliet Limestone was used.

The education of the general public

wood, hot and cold soft water is provided for the bathroom and kitchen, while a hot air furnace warms the whole.

We understand that the house complete cost about \$3,500.00 although in many sections of the country this would be a low estimate for the number and convenience of the rooms.

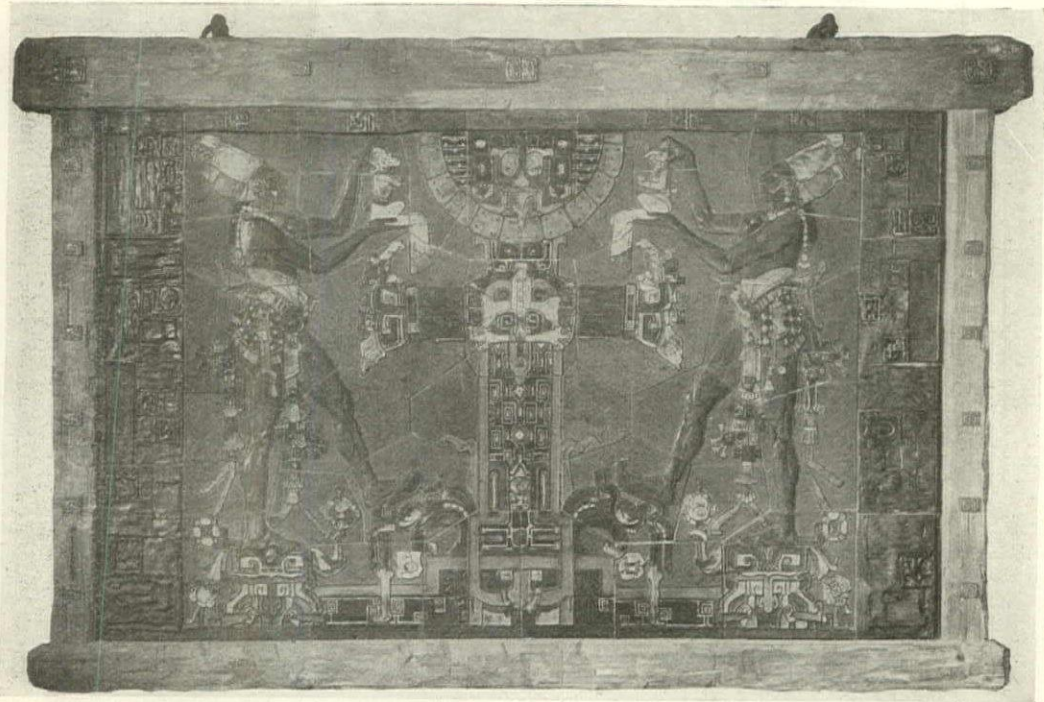
Parties to a building contract may legally provide that disputes shall be submitted for decision to the architect and that his conclusion thereon shall be final.—Reilly v. Rodef Sholem Congregation, 90 A. (Pa.)

Color in Buildings

WRITING about the lack of color in modern architecture, Mr. Charles De Kay, the noted art critic of New York, alludes to the bas relief in enameled tiles at the exhibition of the Architectural League in New York, and calls attention to the fact that notwithstanding all that has been done in the way of tiles to decorate the interior and exterior, our architects are not tak-

dows in monotonous rows whose deadly iteration numbs the mind and steeps the soul in gloom. By the deft introduction of tiles in smooth or dull glazes much might be done to render tall buildings less repellent, and to some degree disguise the enforced but ghastly regularity of their fenestration.

There are, however, bolder workers in the field for urban architecture. At the



A Tile Designed by Leon B. Solon.

ing the advantage they might of this material to enrich the townscape and provide sumptuous and lasting color schemes for churches and capitols, hotels and libraries, railway stations, public and private buildings.

The color notes from smooth or dull or unevenly surfaced products of the kiln have been so far mild enough, discreet enough, well enough suited to the timidity one meets when the question of color comes up. Even these anemic hues are often set aside for drab or dead white walls unrelieved by anything save win-

exhibition of the Architectural League, one of the best in recent years, glazes are shown of great promise in a large mural panel, or tablet, not composed of small cubes like mosaic, nor of tiles in formal squares, but of irregular pieces of faience. The effect of the joining suggests the so-called Cyclopedian masonry of the early Greek period. The theme chosen is that of Cacique priests in adoration of their gods. Worship of the old gods of Incas, Mayas, and other culture-tribes of South and Central America and Mexico may well be taken for compositions of great

boldness and beauty, and particularly are they suited to tiles in relief. We may have here the beginning of a national style of decoration for large buildings.

Unlike much of the tile work made today, this design is carried out in singularly rich and harmonious tones. The artist has been inspired by that strong feeling for simple broad color masses found in decorations that survive from the pagan past, but found also in textile and fictile work of modern Indians.

Now the atmosphere of our cities charged with chemicals works banefully on ordinary pigments, but tiles with a well baked body and firm glaze withstand these acids as they do heat and cold, sunlight and frost. They give the least possible lodgment to the grime that floats in the air.

Tiling can be varied in tone to prevent a too solid color, it can be modeled in relief to obtain effects of shade. Chance alterations in tone, or hazards of the kiln allow the architect a gamut of color vibrations on which to play the changes. Such examples of American tile work are of happy augury, for they must mean that architects can obtain soft or bold effects of color if they want them. Perhaps through this material we shall have presently an architecture better suited to our brilliant atmosphere, our autumn

woodlands, than the doleful kind we inherit from Europe. In the hands of architects who have some feeling for color we should have rich and varied decorations for school house and city hall, hospital and public library, clubhouse and theatre, market and museum. We should demand to be at least as favored in this way as were the men of the middle ages and the ancients of Greece, Assyria and Egypt when they built their temples and palaces.

The illustration shows one of the pieces exhibited, designed by Leon J. Solon, and made by the American Eneastic Tile Co. The entire piece weighs about 3,500 pounds and is three feet high by six feet long.

The contract between C., a materialman, and B., a building contractor, binding C. to conform to requirements of the specifications for the building, the plans and specifications are to be regarded as part of their contract.—Berger Manufacturing Co. v. Crites, 165 S. W. (Mo.) 1163.

In an action on a building contract containing an arbitration clause, the award of the architects charging the contractor with liquidated damages for delay was properly admitted in evidence.—Reilly v. Rodef Sholem Congregation, 90 A. (Pa.) 345.

Dont's for the Pattern Maker

Don't round up with the ribs and corners of a pattern until all pieces have been assembled.

Don't glue cross grain, for a distorted pattern is very apt to be the result.

Don't proceed with the alteration of an old pattern, without first carefully checking it up.

Don't fail to number and place location marks on all loose pieces of pattern and core boxes.

Don't forget to place a marker upon the core print, if the core can be reversed.

Don't fail to nail the lead letters and numbers on the pattern. One nail in each letter is not enough to insure them staying right side up.

Don't number the core boxes upon the face of box; sand in time will wear it off.

Don't forget that dowel pins belong in the cope half of pattern.

Don't forget to make your core boxes scant in length and width, as cores, when drying, usually sag and swell.

Don't fail to make the necessary provision for rapping and drawing the pattern.

Don't forget to consider how the casting is to be machined, and provide the necessary tool clearance.

Don't fail to consult the molder; his suggestions may be helpful, and we cannot do without him.—The Tradesman.

OUR READERS PAGES



[The Editor does not hold himself responsible for the opinion of correspondents. Short, crisp letters will be appreciated. To insure publication, the name and address of the writer must accompany the communication, not necessarily for publication. Sketches of work or methods will receive our earnest attention. These columns are open to our readers at all times without charge, and any questions or experience will be given proper space.—Ed.]

Answers

A CONCRETE BALUSTRADE

From "Concretor," Detroit, Mich. In reply to PLASTERER'S request, I submit the following, which is taken from "HOW TO USE CONCRETE," an excellent work on concrete. This, I think, covers all your correspondent asks for.

Moldings and stone railings for bridges and other forms of construction have lately been constructed in poured, reinforced concrete, and many engineers and contractors are familiar with the difficulty and expense connected with casting good, perfect monolithic concrete for ornamental purposes.

Stone ornamentation, manufactured in art stone, generally gives better satisfaction, if made under competent supervision by skilled labor, and cast monolithic stone. In most cases, too, there is a distinct saving in cost. Fig. 1 shows a typical section of an ornamental bridge rail or balustrade that will find frequent use. Figs. 1 to 12 show sections of the molds, giving the construction in detail.

In a job of fair size it pays to make the stonework on the ground under a temporary shed or shelter, for the reason that cement and sand can be transported much more cheaply than the finished product. Moreover, art stone is likely to be damaged when it is hauled some distance in wagons and handled by unskilled labor.

For making the molds, a full-sized section drawing should always be furnished by the architect or engineer, and on this the details of the mold should be drawn, or a separate copy made. Men familiar with the general practice of machine pattern design should be employed for making the different parts of the molds. All plain

moldings, like that in Fig. 1, main cornices, bases, balustrades and copings are best made of yellow pine.

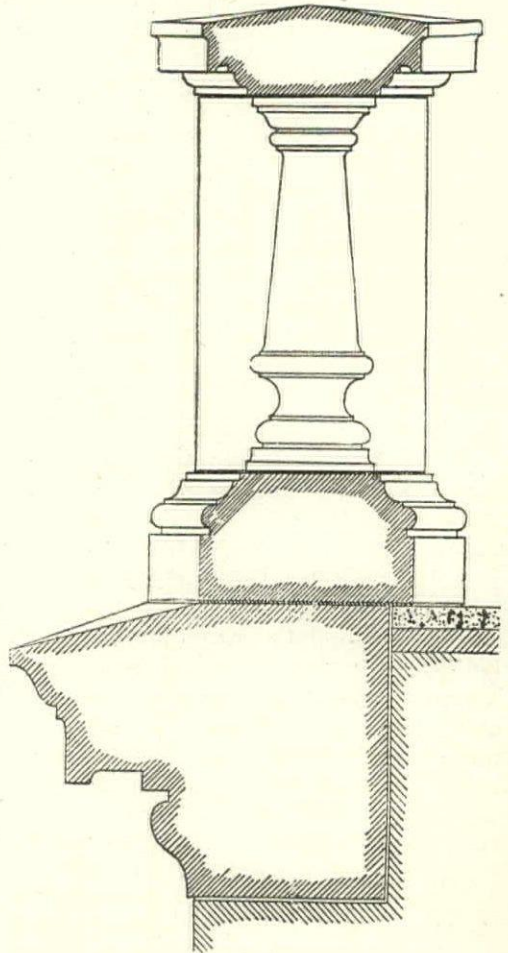


Figure 1.

Fig. 2 shows the section of a mold for the main cornice. The negative portions

are constructed and put together in such a way that they may be removed piece by piece without disturbing the contents. The outside portion of the mold should always be constructed of boards of such thickness that they will not give under the strain of tamping. Clamping the mold to prevent it from spreading is of great importance. A band of strap-iron, placed around the mold, fitted with wedges to take up all the slack, is often necessary. This is shown in Figs. 2 and 3.

Before a wooden mold is used, it should be coated inside with two or three layers of shellac, and each coat, after it is dry, should be sand papered. Fig. 4 shows a section of the base molding for balustrade. This is constructed on the same principle as the others, and the illustration shows a section of the mold, with a sand pallet, ready to turn over. All stones having a mold opening of from 12 inches to 16 inches may be turned over in a bed of sand 6 inches to 8 inches thick, after the surface has been carefully leveled with a straight-edge. With larger stones, it is difficult to turn the mold over, since the cast is liable to slip out before the mold is completely turned. For this reason, fill on the top of the finished concrete about an inch of fine sand, and nail on a pallet at the top, as shown in Figs. 4 and 5.

MOLD FOR COPING

Fig. 5 shows section of a mold for the coping of the balustrade. This mold is also built on the same principles as the foregoing, except that the parts of the mold marked A and B are held in position with wood screws while the tamping and molding are being done. These screws are removed as soon as the mold has been turned on a sand pallet, as before described. All portions of this mold may be removed immediately after turning, except the pieces marked A. The piece marked B may be removed immediately by taking the sand from under it, when this part slips down.

Before the part A can be removed, from two hours to a day are required for the concrete to set, according to the size of the stone. For this reason it is advisable to have several pieces of this molding made

at a time, in order to permit continuous operation.

When the stone has hardened sufficiently, remove the sand from beneath it so that the mold will fall straight down as soon as the

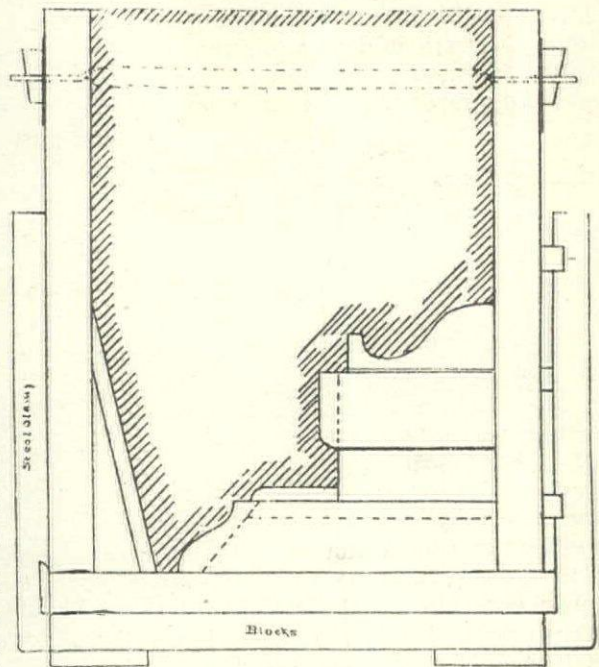


Figure 2.

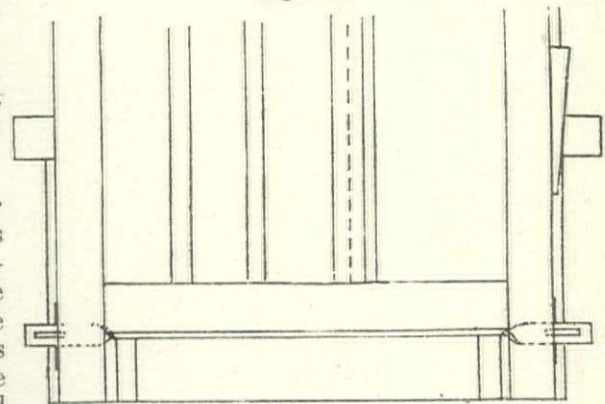


Figure 3.

wedges holding the band clamp are removed. The thickness of sand on the pallet should always be greater than the depth of the water-drip on the profile, so as to allow its removal.

Coping with no bead on top can be more easily cast from the upper side, but this top, being finished by hand with the trowel, always results in an uneven appearance, even with the most careful work. It should therefore be avoided.

As soon as the mold is removed, repair all imperfections with an iron molder's trowel. Where corners are defective and not sharp, hold a piece of board, smooth finished, along one side of the corner, and fill in the defect with earth-moist material. A little skill is required in repair work, but when the work is done while the concrete is still fresh, the joint cannot be seen later on. Any repairing done at a later stage

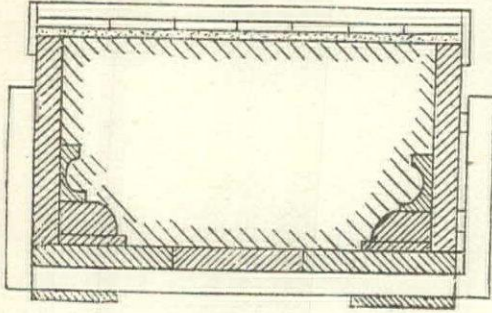


Figure 4.

has to be done with wet cement, and when it dries out always shows a different color.

In order to make the mold and model for balusters, a full-size elevation and drawing are required. From these are made a model in plaster of paris, and from the model a piece mold is made in the same material. Figs. 6 and 7 illustrate the process of making a plaster model for a balustrade with a circular draw mold. Fig. 6 shows the elevation of the model with draw mold, its

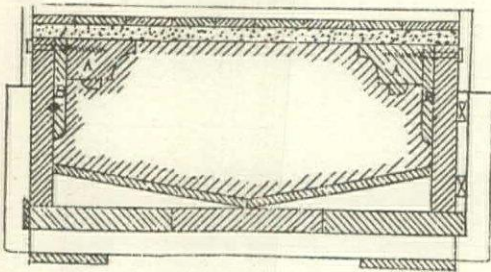
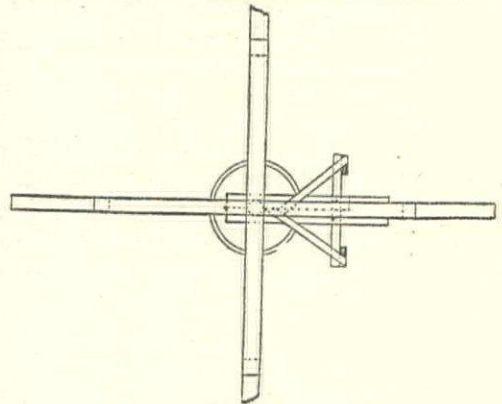
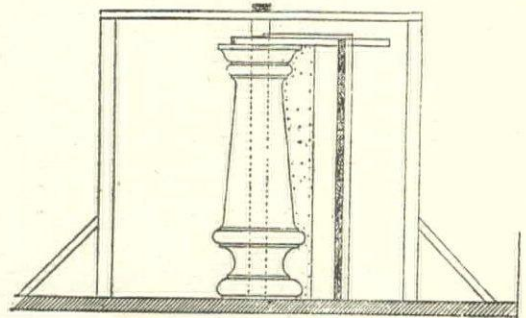


Figure 5.

construction and the method by which it is held in place to exclude variations in turning it around. Fig. 7 shows the same arrangement in the ground plan.

To make the draw mold, cut out from heavy tin or galvanized iron the negative part of the profile only the parts that are round; the square top and base are attached to the finished model later.

All edges of the tin should be carefully filed to a right angle with the plane of the tin. Then the tin is nailed to a wooden profile, beveled on one side at an angle of about 60 degrees. The tin profile should always project from one-eighth to one-fourth inch over the whole length. Cross-boards and braces are nailed as shown, in order to give the mold a secure guide on the table and exclude variations. In the center of the table fasten a center block, held in position by four outside blocks, cross-braced on top. The top of the draw mold fits into the center block, in a round notch, around which



Figures 6 and 7.

the draw mold circles. The fastening is such that the mold may be removed for cleaning, during the process of "drawing" the model. For this purpose, the top board is made in two sections; one end is held together with a flat hinge and the other end with a nail on top of the mold; the nail is removed by taking off the mold itself.

"SWEEPING OUT" THE MOLD.

When this frame and mold are securely in position, put plaster of paris around the center block and draw the mold over the mass to remove all surplus plaster. The plaster should be mixed to the consistency

of syrup and permitted to stand until it assumes the consistency of mortar used in laying brick. This will take from three to five minutes.

To complete one mold usually requires

carvings or other plastic ornamentations may be readily added as required.

Cover the completed model with a coat of shellac and a thin coat of grease, to facilitate removal. The model is now ready for making a plaster piece mold, as shown in figures 8 to 12.

Figure 8 shows a vertical section of the mold with sections for encasing cap; figure 9 shows the ground plan of the lower section. In beginning the manufacture of the sectional pieces, always begin with the pieces marked B, and divide the lower and the upper part, having a square plate as

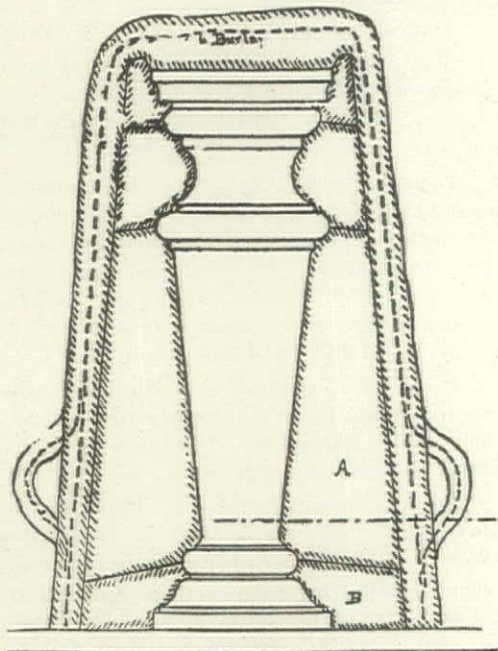


Figure 8.

several mixtures, because of the quick hardening of the plaster. When the mold is nearly perfected in all its details, use the plaster thinner, for the reason that a mixture of this kind hardens more densely and

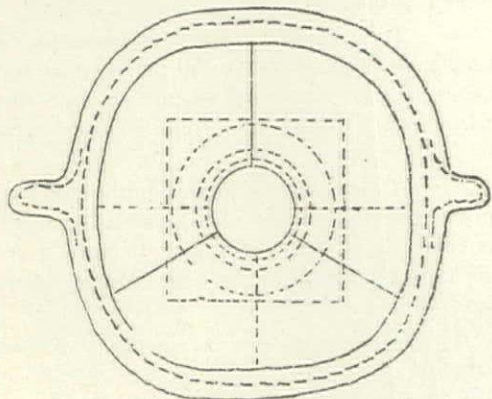
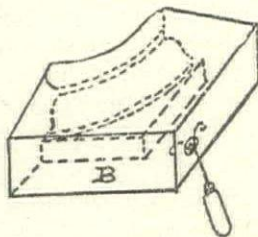
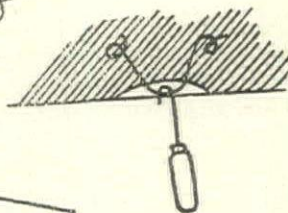
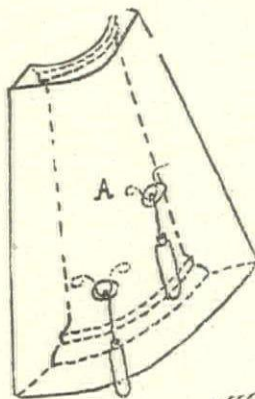


Figure 9.

produces a smoother surface. When the mass prepared by moving the profile about it is completed, paste onto it the square head and base in separate moldings. These are easily molded in a wooden frame, and



Figures 10, 11 and 12.

shown by the dotted line in the ground plan, Figure 9. All other portions of the round section may be divided into three equal parts, as indicated.

Each piece is best molded directly against the preceding one, made ready and cut, each one being slightly greased to prevent adhesion of the sectional parts. Missing portions of the mold may be built in with the assistance of a small tin plate. When sufficient material has been put into one section, cut it with a knife or plane or saw

it into the shape required, leaving the outside form in the shape of a conical object without undercuts, as illustrated in figures 10 and 11. It is advisable to insert a wire hook into each piece at the proper place, as shown in figure 12. This is left with a space around it so that the piece may be lifted with a hook, as shown in both figure 11 and figure 12.

After all the pieces are built up as described, smooth up the whole outside of the mold and cover the wire hook openings with clay, flush with the surface. Mark all pieces with running numbers, using an indelible pencil, covering the mold with a coat of grease and a plaster cap, as shown in the section, figure 8. This plaster cap is commonly made from 1½ to 3 inches in thickness, according to the size of the object to be molded, and should always be reinforced with burlap, cord or wire, to prevent it from warping or breaking. For ease in removal, it is well to attach to this cap some hand-grips, reinforcing them with wire, cord or burlap. After this cap has hardened it is easily taken off, provided the parts beneath it have been properly formed, as suggested.

When the plaster cap is taken off, the parts of the mold are removed one by one and all defects, air-holes, etc., are corrected with two or three coats of shellac. Each piece is now inserted in its proper position (following the indelible pencil numbering) in the plaster cap and the mold is now ready to be used. It should be filled and tamped with care, using the dry molding process, in order to obtain a color uniform with the other parts of the completed work.

Should there be trouble in molding, owing to heavy projections on the balusters, leave the cast an hour or two in the mold. In case the mold is hard to remove, use inside of it a light coat of grease and petroleum.

Where there are heavy projections and ornamentation, with small details, it is best to use the wet process of molding.

WORKMAN'S COMPENSATION LAWS.

From an "Old Chip," Chicago, Ill.:

Some time ago an Inquirer wished for some information regarding the workman's

compensation laws of Iowa. Up to date, I have not seen the query answered at any length, so if not too late, I submit a synopsis of the law, as now in force in the State of Iowa, and trust it may be satisfactory to the querist.

"Date of enactment." April 18, 1913; in effect (a) establishing industrial commission and providing for insurance of employees July 4, 1913; (b) compensation features, July 1, 1914.

"Injuries compensated." All personal injuries arising out of and in the course of employment causing disability of more than two weeks, or death: except when caused by the injured employees' willful intention to injure himself or another, or by the intoxication of the employee.

"Industries covered." All industries except agriculture, in absence of contrary election by employer. Compulsory as to State and its municipalities.

"Persons compensated." Private employment: All employees in industries covered in absence of contrary election, except clerks not subjected to hazards of the industry and casual employees. Public employment: All employees of the State and its subdivisions.

"Burden of payment." Entire burden is on employer.

"Compensation for death."

(a) Reasonable expenses of the employee's last sickness and burial, not to exceed \$100.

(b) To persons wholly dependent, a weekly payment equal to 50 per cent of the wages of the deceased employee, but not more than \$10 nor less than \$5 per week for 300 weeks.

(c) If only partial dependents survive, such a portion of the above as the amount contributed by the employee to such partial dependents bear to his annual earnings.

(d) If the employee was a minor whose earnings were received by the parent, a sum to the parent equal to two-thirds of the amount provided for persons wholly dependent.

"Compensation for disability."

(a) Reasonable surgical, medical, and hospital services and supplies for two first weeks, not exceeding \$100.

(b) For total temporary disability, 50 per cent wages, not more than \$10 nor less than \$5, (unless wages are less than five, then full wages), for not more than 300 weeks.

(c) For total permanent disability, the same compensation as for temporary disability, to be paid for a period of not more than 400 weeks.

(d) For partial permanent disability, (specified maimings) 50 per cent of average weekly wages for fixed periods.

Lump sum payments may be substituted on approval of the court.

"Revision of benefits." Payments may be reviewed by the industrial commissioner at the request of either party.

"Insurance." Employers may insure in approved companies or mutual associations, or contract with employees to maintain approved scheme in lieu of the compensation provided by the law, provided there is no diminution of benefits.

"Security of payments." Employers must insure in approved companies or mutual associations, or furnish satisfactory proof of financial ability to make payments, or deposit security with the State insurance department. In case of insolvency of the insurer a claim for compensation becomes a first lien, and in case of legal incapacity of insured to receive the amount due the insurer must settle directly with the beneficiary.

"Settlement of disputes." Disputes may be settled by arbitration.

FLOOR SPACE FOR SCHOOL.

From "Architectus," Buffalo, N. Y.:

"Carpenter" of Mount Forest, Ont., should not use up less than 13 superficial feet for each pupil, and where possible should provide for 162 cubic feet of space for breathing purposes. This may be obtained easily by giving a little more floor space, or making the ceiling a little higher. The floor space for halls and assembly rooms may be somewhat less, but churches having pews should have fully the space named, but their high ceilings will insure plenty of breathing space.

DATES AND STYLES OF ENGLISH ARCHITECTURE.

From "Architectus," Buffalo, N. Y.:

Herewith, Student of Cleveland, O., will find what he asks for, briefly rendered:

ANGLO-ROMANESQUE.

1. Early British or Anglo-Saxon.
2. Ante-Norman, about 950 to the Conquest.
3. Norman, 1066—1170.
4. Transition, 1170—1200.

GOTHIC.

5. First pointed, 1200—1240 (*Early English*).
6. Late or florid first pointed, 1240—1270 (*Geometric*).
7. Geometric middle pointed, 270—1330 (*Geometric or Early Decorated*).
8. Complete middle pointed, 1330—1380 (*Flowing Decorated*).
9. Third pointed, 1380—1485 (*Perpendicular*).
10. Florid third pointed, 1485—1546 (*Tudor*).
11. Elizabethan, 1546—1650.
12. Various modifications of "Renaissance" and Italian, 1650 to the present time.

STUCCO

From P. J., Illinois, in reply to B. S., Michigan:

The best kind of metal lath is a matter of the particular situation. The lath should be of heavy material and galvanized or painted.

Preparation of stucco requires a considerable knowledge of plastering in order to get exactly the right proportion of materials.

Usually three coats of stucco are applied practically the same as interior plaster except that the third coat has a different finish. A Portland cement is used in place of plaster of paris.

The actual cost per square foot depends upon the materials used, the thickness of the coats and the number of coats, also a great many other local subjects which we are, of course, unable to determine. Including the metal lath and all of the labor, however, it should not exceed \$1.25 per

square yard which, of course, figures about fourteen cents per square foot.

No moisture is needed between the coats unless there is a considerable delay in applying the following coat, in which case it is customary to sprinkle the surface before applying the next coat.

The profit charged is a matter for the individual contractor, from ten to fifteen per cent being usually figured. The size of the job has a good deal to do with the profit desired, and some jobs require more watching, more care and consequently costs more per square yard or foot.

TRUBLE AND DAMPNESS

From A. C. M., Illinois:

G. G., New York, will have to get some sectional pipe covering on his water pipes to stop the sweating. It does not need to be more than an inch thick to do the work. This insulation will keep the pipes from freezing, and also keep the water hot on the way to the bath room. There are some paints on the market supposed to stop sweating of pipes, but personally I never used them.

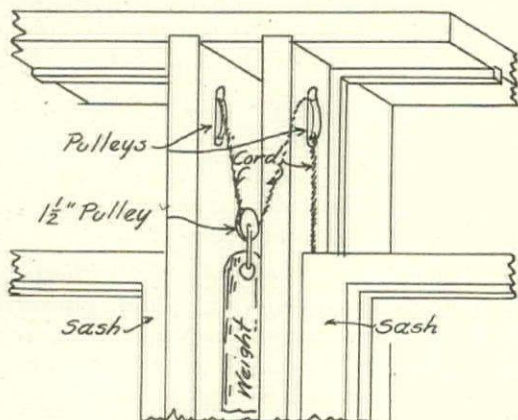
You can possibly paint the outside brick wall with waterproof paint made for the purpose. This paint will probably stop the moisture coming through unless it comes up from the ground and then you have a job on your hands. Be sure there is not a leak in the conductor pipe which keeps the ground wet at this point.

DOUBLE WINDOW WEIGHT.

From A. C., Hazelton, Pa.:

I will say to Young Mechanic of Okmulgee, Okla., that one weight is often used

to carry the side of two sash, in a double (or mullion) frame, and the mullion casing can be only 4 inches wide, on ordinary frames. The jambs take $1\frac{3}{4}$ -inch, and leaves $2\frac{1}{4}$ -inch space for weights. Each weight has to be heavy enough to carry one-half of each sash, so there will be two weights in the mullion instead of four. To operate this, use a $1\frac{1}{2}$ -inch awning pulley with eye. Fasten the eye to



weight with a wire, then run the cord through the pulley from one sash to the other. Be sure to have the cord the right length, so when the inside two sash are down, the weight will be near the jamb pulleys. Reverse action for top sash. The drawing is only a section showing construction and idea asked for.

We also wish to acknowledge excellent answers to this question from S. A. H., Lansing, Mich.; B. R. B., Bay Shore, N. J.; E. N. W., Crawfordsville, Ind.; J. T. F., Ottawa, Ill.; J. M. N., Petersburg, Mich.; Young Carpenter, Kalamazoo, Mich.

Questions

SLATE ROOFING

From C. D. B., Michigan:

I have a contract for a slate roof in which it is specified that all slate shall be bedded in elastic cement three feet from all gutters and one foot from hips, valleys and ridges.

Is it best to leave the felt off where the cement is used? Do you use a cant strip? Is each course bedded as laid, or is the cement spread first? How is the cement kept from showing at the butt of the slate?

ECHOES IN A SCHOOL ROOM

From H. F. G., Missouri:

I desire information as to how to overcome the ringing sound or echo in a school house. Whenever anyone speaks or makes a little noise the vibrations set in motion are very annoying.

The room is 28 x 37 with a 12 foot ceiling. Walls are concrete blocks plastered directly on the blocks.

CEMETERY BUILDINGS AND GROUNDS.

From "Student," Ill.:

I am in search of some book on cemetery construction, vaults and lay-out of grounds. Will you or some fellow reader, advise me of such books and where they may be obtained and oblige?

WORKS ON SCHOOL.

From "Builder," Tenn.:

Is there a good and a late work on school architecture that you can recommend for a sturdy young man?

MORTAR COLORS

From J. H. D., Kentucky:

Will you give me some information on mixing black mortar? I have been using the best black mortar color I could get, adding it to a mortar made of one part cement, one part lime and five parts sand, but it turns slate color when dry. We are using a non-porous brick.

STAIRS FOR SMALL COTTAGES.

From "Young Chip," Wis.:

I wish some reader would publish some details for stairs, newels, balusters, hand rail, brackets, treads, spandrels, and other work, besides plans and elevations. A few hints and suggestions now and again, on hand rails of different kinds, would be appreciated I am sure, by many of your old subscribers, and all of your new ones.

STATEMENT OF THE OWNERSHIP,
MANAGEMENT, CIRCULATION, etc.,
REQUIRED BY THE ACT OF AU-
GUST 24, 1912,

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CEMENT PORCH FLOORS

From G. K. J., New York:

Would a cement floor on a porch have any great tendency to rot the sill of the house against which it would rest, in order to bring it up to the level of the door sill?

If so, would a painted pine sill withstand this tendency, or what precautions should be taken? The porch floor will be built up from the ground with gravel and cinders.

CEMENT SIDEWALK.

From "Builder," New Jersey:

How much is a superficial square foot of cement sidewalk worth, including all material and to be laid the usual thickness? Isn't sixteen cents a foot too much?

A SOOT QUESTION

From N. S., Hoboken, N. J.:

When you want to use old bricks which are covered with soot, what can be done to protect them from staining the plaster.

TUCK POINTING

From P. J., Missouri:

Please let me know the proportions and materials used in making the different colors of tuck pointing mortar. How much good lime mortar will it take to lay 1,000 brick for spread work, and what proportions of lime and sand are used.

George F. Dean, 537 S. Dearborn St., Chicago.

C. P. Hooker, 537 S. Dearborn St., Chicago.

B. E. Mitler, 203 Broadway, New York City.

Known bondholders, mortgagees, and other security holders, holding 1 per cent or more of total amount of bonds, mortgages, or other securities:

A. E. Taylor, 24 N. Fifth Ave., Chicago.

Charles F. Roberts, 5519 Cornell Ave.

FRED D. PORTER,

Business Manager.

Sworn to and subscribed before me this 16th day of September, 1914.

CLAUDE P. HOOKER,

[SEAL]

Notary Public.

(My commission expires January, 1918.)



LEGAL DECISIONS

OF INTEREST TO BUILDERS

Prepared for the
NATIONAL BUILDER
by George H. Murdock

Where an architect directed a contractor to make a change, saying that he would personally pay him the difference, the owner was not liable for such item.—Hatfield Special School District v. Knight, 164 S. W. (Ark.) 1137.

Where it would require the addition of 300 feet of radiation to make a heating plant comply with the contract, there was no substantial performance.—Symms-Powers Company v. Kennedy, 146 N. W. (S. D.) 570.

That one employed to repair certain places in the roof and guttering of a building was not employed to repair the particular part which gave way with him was not sufficient to relieve him of the assumption of risk, since the fact that some parts of the roof and guttering were out of repair was notice to him, as an experienced workman, that it was all more or less dangerous.—Russell v. W. E. Caldwell Company, 164 S. W. (Ky.) 787.

Where a contract for a school building required plaintiff to furnish furring for plaster ceilings, metal plaster partitions, and metal lathing, and also declared that building terms used should have the meaning set down to them in a particular Dictionary of Architecture and Building, and the definition of the word "furring" in such work was "a light framework or simple strips to give a semblance of constructive form by means of some plastic material on a frame of the necessary shape," such definition was itself ambiguous; and hence the court could properly admit expert evidence to determine whether such word included steel work attached to trusses con-

sisting of strips of bars of steel three inches in width by three-eighths of an inch thick, and weighing approximately three pounds to the foot, to which other strips were tied to sustain metal lathing and plaster finish.—Lasar Mfg. Co. v. Pelligreen Construction & Investment Company, 162 S. W. (Mo.) 691.

Plaintiff was injured by the breaking of one of the timbers in a scaffold erected by carpenters in the construction of a house under a contract with defendant. Plaintiff had entered into a contract with defendant to furnish and put in place the tin valleys and gutters for the house at a specified price, and was injured while using the scaffold in the performance of his contract. It is *held*, the relation of master and servant did not exist between plaintiff and defendant, and the rule of safe place to work does not apply.—Resnikoff v. Friedman, 144 N. W. (Minn.) 1095.

Within a building contract, providing that if the contractor was delayed in the prosecution or completion of the work by the act or neglect of the owner or architect, or by any casualty for which the contractor was not responsible, the time for completion should be extended accordingly, but that no such allowance should be made unless a claim was presented in writing to the architect within forty-eight hours of the occurrence of the delay, a delay in commencing work, due to the act of a third party in placing macadam on the lots, was such a delay as required the contractor to make claim in writing as a basis for an extension.—Hiller v. Daman, 166 S. W. (Mo.) 869.

Book Notices

Notice—All books noticed in these columns may be obtained from this office at publishers' prices. All postage or express prepaid. (Money and address must accompany all orders.)

CONSTRUCTION OF CONCRETE, AND INSPECTION: Being a treatise on the inspection of concrete constructions, containing practical hints for the superintendents and others engaged in the construction of public and private works, by Jerome Cochran, B. S., C. E., M. C. E., published by Myron C. Clark Publishing Company, Chicago, Ill. Price \$2.50.

This is an exceedingly useful work to any person who has anything to do with concrete work, and it seems exhaustive, as it covers every point and subject the practical man would be required to be conversant with, and every subject contained in this book is indexed, and convenient for finding. A list of the subjects dealt with, would occupy more space than we could possibly allow as they cover over 25,000 separate headings, bringing everything known before the reader, including chemistry of the materials used, methods of using, processes, qualities, and to what purpose employed.

We quote the following items which will give the reader an idea as to the trend and character of the work:

PRELIMINARY PREPARATIONS. In no case on an exposed surface of the concrete should joints of any component pieces of the forms, nor the grain of the wood, be visible. Some preliminary treatment will therefore be found necessary, such as clipping off rough projections, as those left by cracks in the form, filing off the arrises, etc. Noticeable voids, or stone pockets, should be filled with mortar in the same proportions as the mortar in the concrete. For methods of patching and repairing defective concrete surfaces, see Article 30, page 338.

TREATMENT BY RUBBING. The method of procedure consists in thoroughly wetting the concrete after the forms are removed, and then rubbing with a circular motion the wet surface with a coarse carborundum stone (No. 16), bringing the surface to a lather. After this stone has been used sufficiently to take off the rough projections and irregularities, the lather must be washed off with a brush, and the

surface again wet, and then dusted with a mixture of dry sand and cement, the proportion being one part Portland cement and two parts dry sand. This coating must be well rubbed into the surface with the coarse carborundum stone (No. 16). Care must be taken not to allow any of the mortar to remain on the surface. To give the final finish, a No. 30 carborundum stone should be used and the whole surface well rubbed.

Best results may be obtained where the concrete has not set hard, preferably a day or two old. A vigorous use of water is also advisable. In the absence of carborundum stone, a block of hard wood, sandstone, old concrete, emery, or pieces of white fire brick or briquettes of one cement and one sand, made in moulds about the size of a building brick, handles being pressed in while soft, may be used. By dusting on a thin coating of cement and sand in proportions stated above, gives a lighter surface than troweling, fills any voids that may be in the surface, and leaves the concrete more waterproof than it would be ordinarily.

A cement wash may be substituted for the dry sand and cement, being composed of one part Portland cement to two parts of fine sand. This wash should be applied immediately after the concrete surface has been thoroughly rubbed with a piece of sandstone or carborundum stone, and the surface rubbed with a No. 16 carborundum stone and the work afterwards washed down with clean water. The grout should be used simply to fill surface imperfections, and must not remain as a film on the surface (see page 406). The result, after the setting of the grout, is a very smooth surface. In hot weather it should be frequently dampened for several days to prevent the small surface cracks so often seen in a finish of this kind.

The work is well and substantially bound, printing is faultless, and the paper above reproach. It should find a place on the shelves of every builder, contractor, architect and engineer in the country.

Building Material Price List

Revised to Date

*Price not given. yp—Yellow pine. wp—White pine. np—Norway pine. op—Oregon pine. rw—Redwood. s—Spruce. oc—Ontario cedar. h—Hemlock. bc—British Columbia cedar. rc—Red cedar. F—Fir. cdr—Common cedar. cyp—Cypress. bm—Board measure. sis—Sized one side. d4s—Dressed four sides. kd—Kiln dried. rg—Rough. c—Clears.

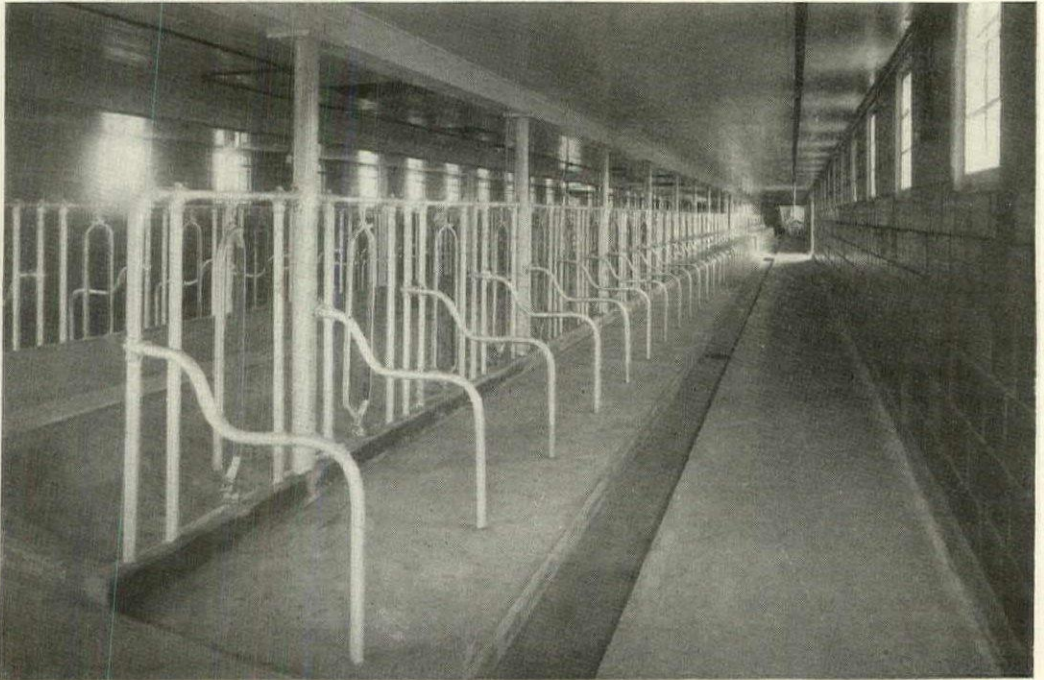
Dimensions—	Seattle, Wash., Corrected by F. T. Bradley.	Chicago, Corrected by J. H. Touchstone.	Omaha, Neb., Corrected by I. P. Hicks.	Southern Ontario, Corrected by F. O. Frantz.
	M ft. BM	M ft. BM S2S	M ft. BM S2S	M ft. BM S2S
2x4 in. to 8 in. up to 16 ft., No. 1.....	\$10.00	\$20.00	yp \$27.00	h \$28.00
2x4 in. to 8 in. up to 16 ft., No. 2.....	9.00	17.00	25.00	24.00
2x4 in. to 8 in., 18 and 20 ft., No. 1.....	10.00	22.00	28.00	28.00
2x10 in. up to 16 ft., No. 1.....	11.00	21.00	30.00	28.00
2x12 in. up to 16 ft., No. 1.....	11.00	22.00	32.00	28.00
2x14 in. up to 16 ft., No. 1.....	12.50	23.00	*	28.00
Each 2 ft. over 20 ft., add per M.....		1.00	1.00	2.00
Select stock as above, add per M.....	4.00	5.00	*	*
Exterior Finish, Etc.—				
1x3 in. to 1x8 in., No. 1.....	27.00	yp \$30.00	yp \$45.00	wp \$35.00
1x16 in., No. 1.....	39.00	40.00	43.00	40.00
1x12 in., No. 1.....	30.00	35.00	42.00	42.00
1½x3 in. to 1½x12 in., No. 1.....	33.00	45.00	48.00	45.00
1½ in. and 2 in., same as above.....	33.00	45.00	48.00	42.00
1-in. drop siding, No. 1.....	25.00	25.00	30.00	30.00
½-in. lap siding, No. 1 cedar.....	25.00	24.00	rdw 30.00	30.00
Enclosing and Fence Boards—				
1x4 in. to 1x 8 in., No. 1.....	11.00	yp \$24.00	yp \$25.00	wp \$30.00
1x8 in. to 1x12 in., No. 1.....	11.00	26.00	24.00	h 25.00
1x16 in., No. 1.....	15.00	*	24.00	28.00
1x16 in., No. 2.....	13.00	*	22.00	24.00
Interior Finish, Flooring, Ceiling, Etc.—				
1x6 in. T. & G. Flooring, No. 1.....	25.00	yp \$24.00	yp \$38.00	wp \$40.00
1x6 in. T. & G. Flooring, No. 2.....	22.00	20.00	34.00	wp 30.00
Ceiling, per M.....	20.00	1.00	2.00	*
Partition, per M.....	30.00	2.00	2.00	*
¾x4-in. Ceiling, No. 1.....	22.00	22.00	30.00	np 30.00
4¼-in., Moulded Casing.....	.02	yp \$1.75	yp \$2.00	wp \$2.00
4¾-in. Moulded Casing.....	.02½	2.00	2.50	2.75
7¼-in. Moulded Base.....	.03	3.00	3.50	5.00
½x9¼-in. Moulded Base.....	.04	4.00	4.00	6.00
1½x4½-in. Moulded Window Stool.....	.02½	2.50	3.00	4.00
Miscellaneous List—				
Shingles, No. 1.....	2.75	rc \$3.50	Per M \$4.00	bc rc 4.00
Shingles, No. 2.....	2.25	3.00	3.75	*
Shingles, Fancy.....	3.50	*	4.50	6.00
Lath, 4 ft., No. 1.....	2.25	3.60	yp 5.50	wp 5.00
Lath, 4 ft., No. 2.....	1.50	2.75	5.00	s 4.25
Pickets, 1x3 in. x 4 ft. 6 in., dressed.....	.03	35.00	30.00	*
Pickets, 1x3 in. x 4 ft. 6 in., rough.....	.02	*	*	*
6 in. x 8 ft. Post, split.....		Piece cdr \$0.13	Piece Cdr \$0.25	Piece *
8 in. x 8 ft. Post, split.....		.17	.30	*
8 in. x 8 ft. Post, whole.....		.66	.40	Cdr \$0.30
6 in. x 8 ft. Post, whole.....		.25	.35	.25
Hardware List—				
Nails, wire, common.....		Cwt. \$2.25	Cwt. \$3.00	Cwt. \$2.85
Nails, cut, common.....		2.10	*	3.00
Nails, wire, fine finishing.....		2.65	3.50	4.00
Sash Weights, cast iron.....		1.60	1.50	2.25
Tarred Felt Paper, best 2-ply.....		Roll \$1.00	Roll \$1.00	Roll \$1.25
Tarred Felt Paper, 3-ply.....			1.25	1.50
Red Rosin, Atlas brand.....			.90	.50
Red Rosin, durable brand.....			.75	.60
Black Neponset.....			*	2.50
Masons' Supplies—				
Brick, blue, at kilns.....		Per M *	Per M *	Per M *
Brick, blue, at kilns, No. 1.....		*	*	*
Brick, blue, at kilns, No. 2.....		\$7.50	*	*
Brick, white, delivered, face.....		7.00	*	*
Brick, red, delivered, backing.....		7.00	\$7.50	*
Brick, delivered, dry pressed.....		18.00	18.00	\$18.00
Brick, vitrified, dry pressed.....			24.00	*
Lime, best gray.....		bbL \$1.30	bbL \$1.25	bbL *
Lime, best white.....		1.40	1.25	*
Cement, Portland.....		.95	1.85	bbL 1.70
Plaster, calcined.....		2.40	1.80	bbL 3.00
Hair, 8 lb. per bush.....		.25	.25	*

NOTE—While these figures are approximately correct at the time of preparing, the continual fluctuations and shifting of prices make it necessary to advise our readers to consult local price lists when making up tenders.—Ed.

Illinois. The plans and specifications are the product of the office of State Architect James B. Dibelka. The building contractor was G. A. Cleland of Kankakee, Ill.

The barn accommodates one hundred cattle, its ground dimensions are approximately 200x35 feet with ten feet of head room on the ground floor and twenty feet from floor to peak of hay loft. The plan of the barn economizes every inch of space to the utmost advantage. Every class of material entering into its construction was selected as being the best for sanitation and safety and yet the most economical to accomplish the purpose.

Tile. The tile are vitrified salt glazed clay. All are of the same color but vary in shade from a light buff to brown just enough to give a pleasing light and shade effect to the walls. The Interlocking Tile are of the shape and dimensions shown in the cut. According to strength tests made by the University of Illinois this tile is capable of supporting over 1,000 lbs. per square inch of surface. The tiles lay up with four inch mortar beds which are so grooved that each mortar joint is mortised and extends only part way through the wall, making the strongest possible joint. The tile units combine to make the 12 inch outer walls,



Porter Fixtures in Dairy Barn.

The architectural appearance of the building is quite wonderful and cannot be well illustrated in black and white reproductions for aside from its splendid form and proportions the color is most attractive. Viewing it from the country side one is struck by its quiet brown walls almost golden in the sunshine surmounted with a roof of subdued tone. This barn is accompanied by two concrete silos which while contrasting pleasantly might have harmonized with the walls of the barn had they been built of silo tile.

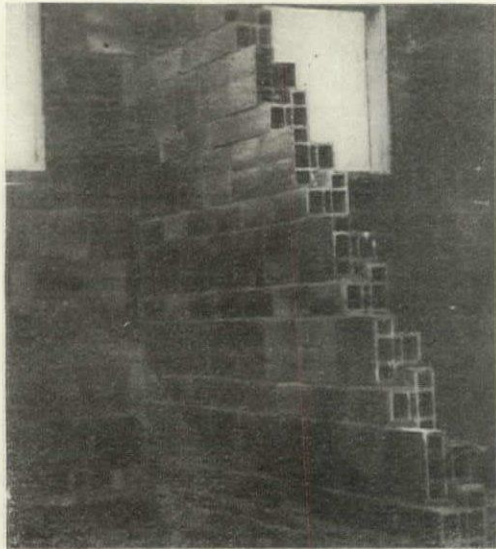
The real construction feature of the barn is the wall, built of Denison Interlocking

as shown in the illustration, so that there are no joints, either horizontal or vertical, which extend through the wall, each joint being broken by a dead air chamber with solid tile beyond. The five horizontal dead air spaces throughout the wall make of it an almost perfect insulator which preserves all of the natural barn heat maintaining a regular temperature against severe winter changes. In the summer these insulating walls repel the sun's heat keeping an inner temperature from ten to twenty degrees below the outer shade reading. The inner partitions are eight inch walls made of the same tile but combined differently as shown

in the illustration. The glazed tile has a moisture absorption under 2%. A hose can be turned on them to wash them clean. The tile lay up very rapidly, each tile being the same volume as ten brick.

The ground floor is of ordinary rich mixture concrete, trowel finished. After the under-floor drains were laid eight inches

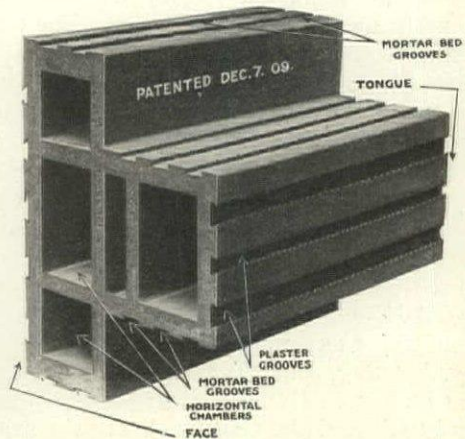
ceiled with dressed and matched lumber, covered with a good quality of roofing paper and shingled with asphalt shingles. The



A Cross Wall.

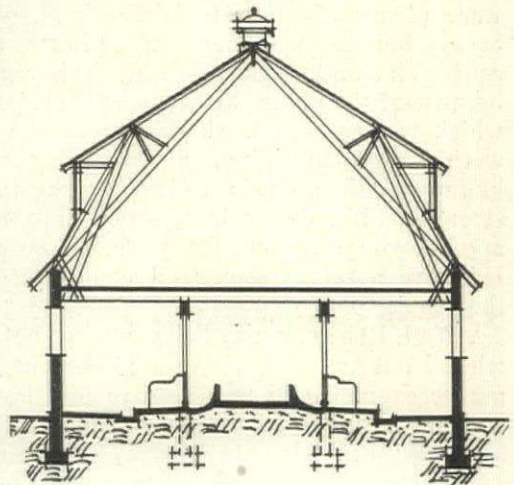
of cinders were packed wet, all stanchions, iron columns and floor attachments fixed in place then the concrete floor poured with forms for gutters and copings. Where the floor met the tile wall the concrete was troweled up over the first course of tile as a coping drain. The ground floor fittings can be seen more plainly in the illustration than by description.

The second floor is of ordinary joist construction ceiled below and above except that underneath the flooring is spread a thick asbestos sheeting of a firestop between the hay loft and the ground floor. The roof is of ordinary rafter construction

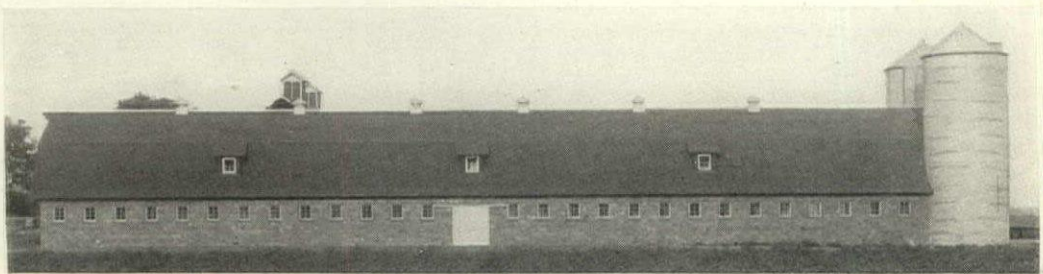


The Tile Used in the Walls.

loft is lighted through dormer windows and ventilated at the peak by galvanized iron ventilators. The resulting structure ap-



proaches the pinnacle of the three virtues of sanitation, safety and economy. Neither solid nor liquid waste can penetrate be-



Side View Showing Silos.
Advertisers' Section.

yond the surface and all surfaces can be flushed clean. No fire can start on the ground floor nor from the outside. There is the minimum chance for depreciation, no painting, reailing or repairs. The temperature economy is of the utmost importance for the comfort and good of the cattle where no artificial heat is furnished and this construction insures the best.

The Gage Tools

"I say, Jim, do you use the Vineland tools?" "The what?" "The Vineland tools." "Naw; never heard of them. I use the Gage tools, and get them direct from the factory at Vineland, New Jersey." "Say, Jim, that's a good joke, and one on you! Don't you know the Vineland tools and the Gage tools are the same tools under different names? In the Northwest, where I last worked, Gage's adjustable planes were all called VINELAND TOOLS, and the boys generally would have no other planes to work with. There were plenty of other tools up there, of course, but they were not so much in favor as the Vineland, or Gage brand. This was because of the planes having wooden soles which made them work easy, and they were all self-adjusting, a quality, you know, which appeals to the workman strongly. If I didn't have a good set in my kit, you may just bet your last cent I'd have a set as soon as I could raise the wind."

"Well, Bob; you may believe me or not, when I tell you that I have used the Gage planes ever since I was able to buy my own tools, and, as the 'patent medicine' ads say, 'I'll take no other.' Whether they are called Vineland or Gage tools, to

me there are no better." "That's what I say," said Bob, so there you are; and what are you going to do about it? as Boss Tweed used to say.

The International Correspondence Schools at Home.

Some cynics have tried to create the impression that one must go away from home to be appreciated. That this is not always true is indicated by a circular sent out by the International Correspondence Schools showing the press opinions of it in their home town of Scranton, Pa.

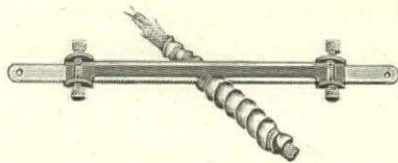
The International Correspondence Schools employ approximately two thousand people in their home offices as well as nearly as many more representatives in all parts of the United States and Canada, thus making it one of the largest industries in the country. As over one million seven hundred thousand students have enrolled for the various courses, it makes this institution the largest educational concern in the world.

The International Correspondence Schools have a number of courses of special interest to those engaged in the building trades from the complete architectural course down to the simple studies of arithmetic, algebra, etc.

The completion of any one of these courses equips a man for better work in his line, gives him an incentive for further study and makes him feel competent to do a higher grade of work.

A Hack Saw Depth Gauge.

Hack Saw Depth Gauge No. 53, manufactured by Millers Falls Company, of Millers Falls, Mass., and 28 Warren St., New York City, is a new tool produced recently by that company, and without doubt,



Hack Saw Depth Gauge.

it will soon be in general use by electricians and plumbers throughout the country. It is a handy little tool, and fills a long-felt want, especially in an electrician's tool kit.

Screw Holes That Hold

Don't put screws in wood—the thread in the hole wears out and the hole has to be plugged.

Use Stine Screw Holes, made of brass, driven into the wood. Will hold the screws tight everlastingly.

Furnished in all sizes for all kinds of work—wood, glass, marble, plaster of paris, stucco, cement and all kinds of metals.

Samples free to architects, contractors and dealers. Write today.

STINE SCREW HOLES COMPANY
Corner Main and North Decatur, Ill.

PASTE THIS DOME
WRITE TO ADVER-



ON LETTERS YOU
TISERS. IT HELPS.

Advertisers' Section.



Featuring "Morgan" Interior Design M-59
Can be made from any kind of wood

Copyright 1914 Morgan

YOURS FOR THE ASKING—A COPY OF OUR 1914 SUGGESTION BOOK

Featuring Morgan Hardwood Doors, showing complete Layouts and Glass Sizes for all Hardwood Doors of Stock Design, also a double-spread color chart showing actual reproduction from Finished Wood Panels treated in accordance with our specifications.

Morgan Doors are architecturally correct, and we are so proud of our product that we stamp the name "MORGAN" on the top-rail of every Hardwood Door we manufacture.

MORGAN SASH & DOOR COMPANY, Department C-33, **CHICAGO, ILLINOIS**
 Factory: Morgan Company, Oshkosh, Wis. Distributed by Morgan Millwork Company, Baltimore, Md.
 N. Y. Office: Craftsman Bldg., 6 E. 39th St., New York City Architects see Sweet's Index, pages 972-973

PASTE THIS DOME
WRITE TO ADVER-



ON LETTERS YOU
TISERS. IT HELPS.

The illustration shows the most important use to which this gauge is to be put, viz., the sawing of flexible conduits. The gauge is used for this purpose in order to prevent the cutting of the insulation on the wires contained in the conduits.

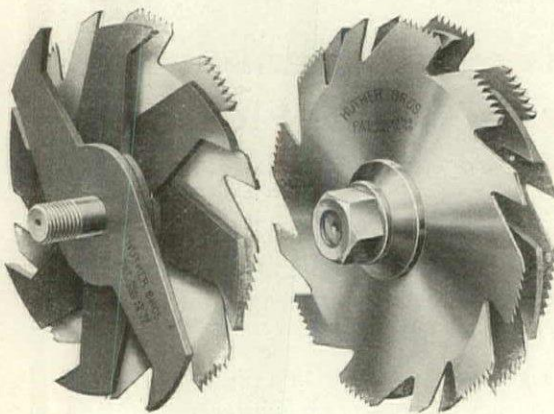
The Gauge may be used also as a stiffener to the ordinary all hard Hack Saw Blades, permitting them to be used in place of flexible blades of inferior cutting qualities.

The Gauge is made of pressed steel of sufficiently rigid stock to withstand any strain to which it may be subjected. The thumb screws, which hold the Gauge in place on the Hack Saw Blade, are of case-hardened steel with points shaped so as to overlap and hold the Gauge on the blade securely. The tool is adapted for blades one-half inch or narrower.

Making Galvanized Steel Products.

The American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa., have just sent us a catalog showing the various uses of their copper bearing galvanized sheets. The catalog describes in detail some of the numerous tests which have been made to determine the best formulas and methods of manufacture as well as shows numerous illustrations of buildings in which it has been used.

We find that this company has for many years been making galvanized sheets for



Two Huther Cutter Heads.

culverts and underground use as well as metal for tanks, silos, roofing, etc. They even show a jail located in one of our Western cities indicating that the material

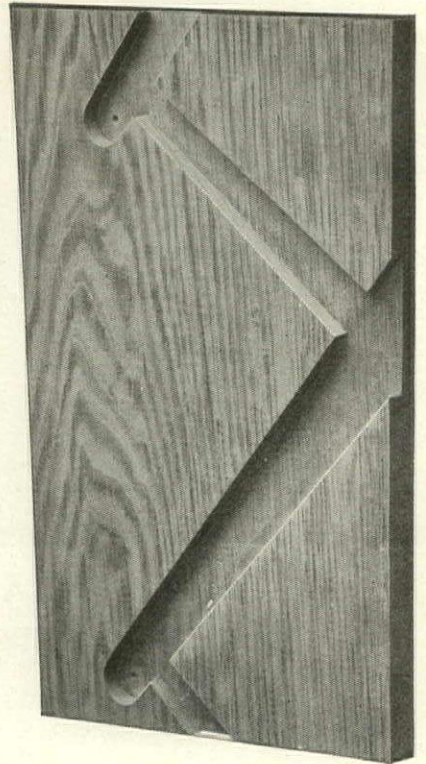
is as proof against attacks from the inside as from the external weather.

This catalog will be of interest as indicating some of the numerous uses which may be made of this product as well as suggesting its use in other capacities.

Stairbuilding Made Easy.

Carpenters who have been obliged to cut out stair strings by the old-fashioned method of boring and sawing by hand will appreciate the ease with which it can be accomplished by the Huther Heads shown herewith. We also show a cut of the completed string, indicating the clean-cut finish which these heads leave.

The Huther Bros. Saw Mfg. Co., Rochester, N. Y., will be glad to show contractors



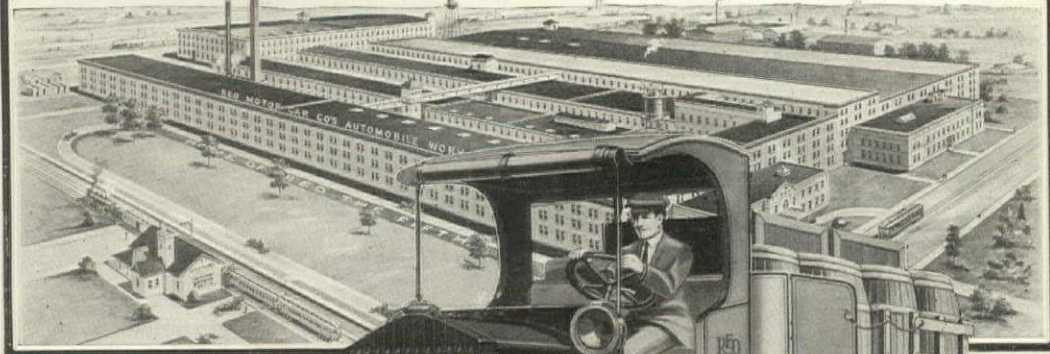
Stair String Made with Huther Cutter Heads.

and carpenters how this work can be done with the ordinary saw table or woodworker and it will be to the interest of our interested readers to secure this information.

Storm-Proof Door Hangers.

The accompanying illustration shows the new No. "88" Adjustable Storm-Proof

The Reason for the Price



\$1650

Chassis With Driver's Cab. Body Extra.

**Model J
Two Tons**



How Can the Motor Truck of Acknowledged Leadership Be Sold At the Lowest Price in the Two-Ton Field?

Whenever superior quality is encountered, it is customary to meet a high price, the Reo Model J, two-ton truck, which knows no equal in quality of construction, superiority of design, and the evidence of perfect performance, is sold at a price which comparison will show to be the lowest in the two-ton market.

The reason for this lies in the immense Reo organization—the same great concern which builds and sells Reo the Fifth, the famous pleasure car.

Raw material, parts, accessories, etc., for Reo Motor Trucks are bought on the basis of the great Reo Motor Car production; the output has reached a point where each workman is a specialist; in selling trucks the immense Reo sales force of more than 1100 dealers is in a position to handle the trucks without additional selling cost. So it is apparent that the manufacturing and selling costs,

the overhead and the buying cost are naturally lower than any other two-ton truck builder enjoys; and that is the reason why the price of the Reo Model J is only \$1650, whereas the average price of 54 competing trucks is \$2701.

Motor trucks are not made in great quantities which characterize the pleasure car business, and the small truck maker whose total annual output may possibly run up to 500 or 1000 trucks, finds it a physical impossibility to compete with a factory that manufactures 20, 30 or 40 machines to his one. This in a measure accounts for the fact that during the past year the Reo Truck has forged into the lead and today is the largest selling two-ton truck in America.

Call on the nearest Reo dealer and let him tell you about the Reo Motor Truck and explain Reo service. Reo Motor Truck catalog on request. Write today.



**REO MOTOR TRUCK CO.
LANSING, MICHIGAN.**

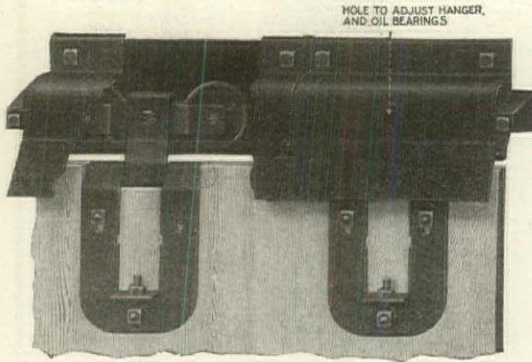
PASTE THIS DOME
WRITE TO ADVER-



ON LETTERS YOU
TISERS. IT HELPS.

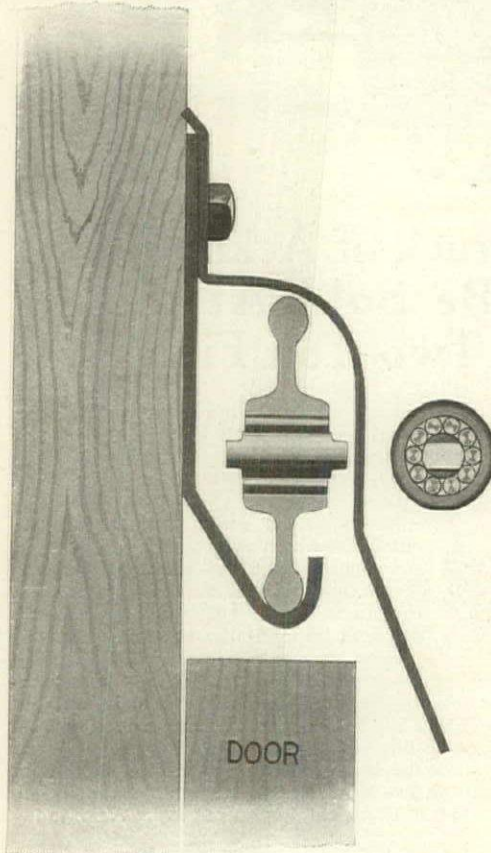
Hanger and Improved Storm-Proof Rail now being placed on the market by the National Mfg. Co., Sterling, Ill.

Many of our readers are familiar with,



The Storm Proof Hanger.

and have used, the No. "66" Rigid and No. "77" Flexible Storm-Proof Hangers made by this firm. The No. "88" Adjusta-



Section of Storm Proof Hanger.

ble is similar in construction to the No. "77" Flexible, and in addition it has two adjustable features, vertical and lateral.

The adjustment features are very simple in construction, easily operated and cannot get out of order. This Hanger also carries the door up unusually close to the rail for an adjustable hanger.

The Hanger is also flexible, and is conveniently packed one pair in a box with bolts for attaching the Hangers to the doors; end-caps and lag-screws for the rail.

The Storm-Proof Rail for use with these Hangers has also been improved. The cover is now made to extend downward $1\frac{1}{4}$ inches farther than formerly. This additional length gives full protection to the opening over the top of the door. The cover-splice over the joint has been eliminated, and the ends of the cover are dovetailed together, giving a snug, weather-proof joint. A new style end-cap is furnished which securely closes the ends of the rail.

The company report this combination is being enthusiastically endorsed by contractors and dealers who have seen it. An illustrated circular will be mailed on request.

Measuring Tapes and Rules.

The most complete line of measuring tapes and rules on the market is shown in Catalog 9 of the Lufkin Rule Company, Saginaw, Mich. The catalog emphasizes the fact that when a contractor or carpenter needs a rule or a steel tape he wants the best.

While not essential for ordinary work, it is interesting to know that the Lufkin Rule Company are prepared to send with their steel tapes a certificate of comparison of the National Bureau of Standards, which certifies the correctness of the tape.

Practically all Lufkin Rules are now made with instantaneous readings, by which the exact reading in feet and inches is given for every point on the length of the tape. This eliminates practically every possibility of error, besides the saving in time. This catalog will be sent to our readers on request and will amaze them both as to the number of rules which can be obtained and in the care which the Lufkin Company take in their manufacture.

Now is the Time to Order Storm Sash

Sash 72c Up—Doors \$1.43 Up

Also 5000 Bargains Shipped Anywhere!!



Storm Window attached with peerless hanger and equipped with Sash Fastener. Open.



Jap-a-Top Roofing

Beautiful—Durable. Surfaced with genuine Slate. 2 colors—Red and Grayish Green.

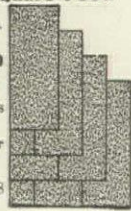
\$2.25 per roll of 108 Square Feet.

Price per sq. of **Jap-a-Top Shingles**

424 Shingles \$4.75.

Also Other Quality Roofing

as low per roll of 108 square feet, 90c.

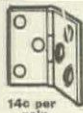


We ship promptly to anywhere you live by **Fast Freight—Safe Delivery, Quality and Satisfaction Guaranteed or Money Back.**

Storm Sash and Doors

Make snug for Winter NOW. All sizes. All styles. Also builders' hardware, hinges, knobs, locks, catches, buttons, etc. "A" Quality and Painted.

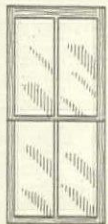
All White Pine STORM SASH as low as 72c. STORM DOORS as low as \$1.43.



Builders' Hardware

Everything in Builders' Hardware direct to you at wholesale—hinges, locks, door sets, window sets, etc.

14c per pair



Windows and Glass

Check Rail windows, 74c up. Plain rail, glazed, 66c up. Transoms, 40c each. 8x10 window glass, 3 1-2c per light. Any size at equally low prices. Safe Delivery Guaranteed. You will appreciate saving over usual prices.

"Quality" Paint

An ideal special Gordon-Van Tine mixed paint for houses. Full measure and full satisfaction guaranteed or new paint free. All colors shown in free catalog. Quarts 35c, Half Gallon 65c, Gallon Cans \$1.22, Five-gallon Kits, per gallon \$1.17.

Also Quality Barn Paints at even lower prices; 75c per gallon and up.

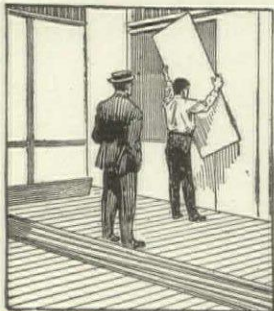
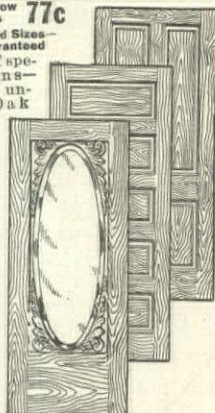
Doors as low 77c

All Styles and Sizes—Quality Guaranteed

Hundreds of special designs—glazed and unglazed. Oak White and Yellow Pine, Cypress, Fir, Oak Veneer, Solid Yellow Pine and Front Doors.

Shingles

Extra "Star A Star" 6 to 2 in., Washington Red Cedar Shingles, price per thousand \$5.10. Special prices on Bevel Siding or Clap Boards, Red Cedar Siding, White Pine Siding, etc.



Wallboard Bargains

Wallboard is The Great Modern Substitute for Lath and Plaster. Also fine for partition to finish off rooms, attics, etc. Comes in sheets ready for use. Goes on dry. Cold-proof, vermin-proof, handsome, durable. **Beats Plaster. Costs Less.** Wallboard costs 50 per cent less to lay. Lasts as long as the building.

Quality Wallboard

1000 Square Feet, \$22. See Special Wallboard offers in Grand **FREE Catalog.**

Save \$100 To \$300 Per Car in LUMBER!



Our special Latest Lumber List and **FREE Catalog** offer choice to you of Millions of feet of clear, dry, clear, seasoned lumber at Wholesale Prices. Dimensions, heavy Joists and Timbers, Drop Siding, Beveled Siding, Ceiling, Partition, Wainscoting, Finishing Lumber, Laths, Shingles, Boards, Posts, Poles, Battens, etc. All lumber graded in accordance with rules of the Lumbermen's Association. All Millwork of High Quality Standards, established by the Northwestern Sash, Door and Blind Mfrs. Assn. Every stick guaranteed up to standard quality. Estimates furnished **FREE** on guaranteed costs to you. **BARGAINS** in Moulding and Finish. Many special designs. All latest new stock. See Big Reductions in 1914-1915 Grand Free Millwork Catalog, just out. **WRITE**

GORDON-VAN TINE COMPANY

Business Originally Est. 1865—49 Years.

738 Federal Street, Davenport, Iowa.

PASTE THIS DOME WRITE TO ADVERTISERS.



ON LETTERS YOU TISERS. IT HELPS.

Design in Dumbwaiters

Some of our readers may imagine that a dumbwaiter is merely a box hung in a shaft and pulled up and down by a rope. That this is not the case, is evident from the catalog of Wm. F. King, 19-21 Kingsland Avenue, Brooklyn, N. Y., who manufactures the King Dumbwaiter. Great pains have been taken in the design of this device which provide against every possible contingency and to furnish a device serviceable and lasting.

The Dumbwaiter is constructed of selected chestnut, properly bound with iron, and has a folding shelf which provides for either a number of small articles or for one of unusual size. The Dumbwaiter is equipped with a safety check for holding the load at any given point and the general design is such as to insure it being practically noiseless.

A more detailed description of this Dumbwaiter can be obtained from the manufacturer who advises us that it is meeting with great success wherever introduced.

Richards-Wilcox Door Equipment

Refinements in house design quickly led to a better class of hardware for those buildings. The improvement in the design and construction of barns, garages and similar buildings has led to the design of improved equipment for these buildings as well.

The Richards-Wilcox Company, Aurora, Illinois, early perceived the value of suitable locks, bolts, hangers and fixtures for these buildings and have constantly added to their already extensive list of products in this line. Their latest circulars show a number of fixtures designed especially to meet the demand for easily operating gable doors in barns for haylofts. Some of these sliding vertically, while others are arranged to slide parallel to the eaves.

Their equipment for garage doors is exceptionally complete and contains fixtures which will allow the use of sliding doors the full width of the front of the building.

These circulars will be of interest to every one of our readers who are erecting barns, farm buildings, stables, gar-

ages, factories, warehouses, etc. They will be sent free on request.

Co-operative Profit Sharing

A system recently developed by the Chicago Millwork Supply Co., 1423 W. 37th Street, Chicago, Illinois, means a great saving to the contractor. The entire system is too long to explain here in detail but our readers who are interested can secure full information from the above address.

The Chicago Millwork Supply Co. have also a number of bargains at this season of the year in which all of our readers will be greatly interested.

Circulars describing these bargains will be sent on request.

Christmas Presents for Mechanics

Christmas is almost with us again and it is time to at least think about what we are going to give our friends.

The Stanley Rule & Level Co., New Britain, Conn., have thought of this very carefully during the past summer and they have made up a number of their tools in neat Christmas boxes, suitable for presents to the carpenter, mechanic and apprentice. Among others they offer a Stanley Hammer, made of special steel, carefully manufactured, full nicked and otherwise highly finished.

Practically every hardware store in the country carries a line of the Stanley Tools. Those of our readers who are located where they cannot be obtained should secure the catalog of the Stanley Company so that they may order direct exactly what they require.

The Use of Hardwood

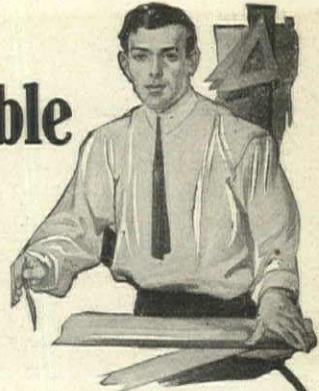
There are many places, both in the building trades and in the general manufacturing field, where extremely hard wood must be used. In such places we see hickory, lignum vitae, ironwood and various other domestic and foreign woods in use.

To work woods of this character requires both special tools and special grinding for the working edge. The tools used

From Dinner Pail to Drafting Table



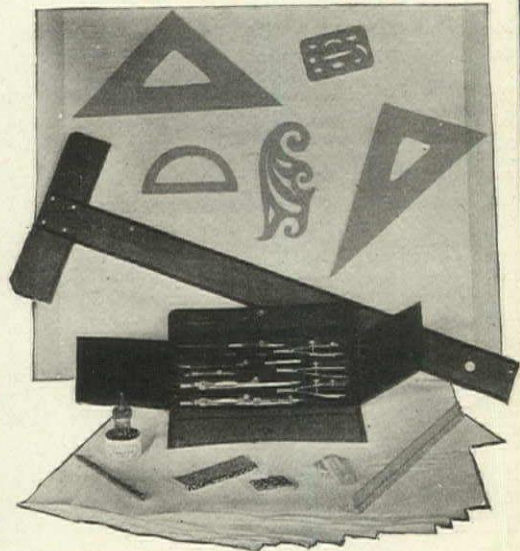
One year ago a young man in an Iowa town was working as a machinist's helper at \$1.75 a day. Now he is a Draftsman in the offices of a large manufacturing concern at a salary of \$1200.00 a year. The American School of Correspondence trained him for this position.



Here is your opportunity to get the training you need to hold down a similar job and earn big money—\$100.00 to \$250.00 per month paid to expert draftsmen. Our easy, practical method will teach you ARCHITECTURAL DRAFTING, STRUCTURAL DRAFTING or MECHANICAL DRAFTING in a few months. You will receive expert individual instruction in the course you select. All drafting instruments and materials supplied absolutely at cost. Also big four volume Cyclopedia of Drawing sent free if you enroll now. Drafting is the foundation of all engineering professions. Prepare yourself for a real man's work. This special offer is made by the greatest non-resident educational institution in the world—a school whose guarantee is backed by seventeen years of successful teaching by correspondence. Just sign and mail the coupon.

Library Free

A \$20.00 Cyclopedia of Drawing is included absolutely free in this special limited offer. Four big volumes as illustrated below. The only work which thoroughly covers MECHANICAL, STRUCTURAL and ARCHITECTURAL DRAFTING. Worth many times \$20.00 to any drafting student. Not only will you receive the best expert instruction, but you will have these books handy for reference at all times—they will answer all your questions authoritatively and promptly. Just think of it—four big volumes bound in half red morocco, gold stamped, 1,720 pages, 7x10 inches, 1,037 illustrations, page plates, diagrams, designs, etc., furnished free, if you enroll now under this special limited offer.



Drafting Outfit at Cost

The complete Draftsman's Outfit, exactly as illustrated, consists of imported German silver drawing instruments in morocco case; 20x25 inch drawing board; ebony lined mahogany T-square; transparent triangles; German silver protractor; French curve; triangular boxwood scale; waterproof ink; pencil; erasers; shield; pencil pointer; handmade drawing paper and thumbtacks. Instruments made by largest and most reliable manufacturer and guaranteed accurate. This complete outfit, offered by many dealers at from \$15 to \$18, will be furnished to you at \$6.40 per set.

This Complete Outfit at Cost

Just Mail the Coupon

Accept this great offer now—today! It never has and never will be equalled. You get the \$20 Cyclopedia of Drawing absolutely free of charge and the Draftsman's Outfit at cost. Don't miss this opportunity. Your whole future may depend upon whether you fill in and mail the coupon. It will only cost you a stamp to investigate. It may mean success and a big future for you.

FREE OFFER COUPON

A. S. of C. N.B.10-14

Gentlemen:—Please send me full information about the course checked below, also further particulars regarding the drafting outfit furnished at cost and the library included FREE with this course.

-Mechanical Drafting
-Structural Drafting
-Architectural Drafting



NAME.....

ADDRESS.....

American School
of Correspondence. Chicago. U.S.A.

PASTE THIS DOME
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ON LETTERS YOU
TISERS. IT HELPS.

for pine and similar woods are practically worthless.

In boring hard woods, the chips have a tendency to break up into powder instead of retaining their ordinary shape. This powder clogs up the screw point so that the ordinary bit will not work. The Irwin Auger Bit Co., Wilmington, Ohio, have met this difficulty by designing special bits for hardwood, in which the screw is very much coarser and the under cutter or floor lip, as usually found in bits, is omitted entirely.

The design of these bits is such that after the screw is started, no pressure whatever is required to force the bit into the wood.

This style of bit can be obtained from practically every ordinary length and size so that the worker in hard woods can equip his tool box with every desired bit and so be ready for any work which may come up in this line.

These various sizes form only a portion of the some 6,500 different styles and sizes of bits made by the Irwin Auger Bit Co. The complete line is shown in a catalog which will be sent to our readers on request and from which they can order direct should they be unable to secure just the styles and sizes they want from their local dealer.

Trained and Untrained.

The principle difference between the man in the office, directing operations, and the man in the ditch doing the hard work, is in the training which these two men have received.

The one has carefully and persistently studied and bettered himself while the other has been more or less content to work from day to day without particular thought of the future.

Some men, in fact many men, were denied education in their younger days. When they realized the need of it, they were compelled to work at what they could get and so had no time for day school or continuous study. To such, the various courses of the American School of Correspondence offers an unlimited advance in education. These studies are pursued in the spare time of the student when not engaged in other work. In other

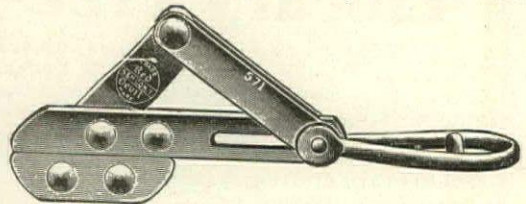
words, it is an evening school at home in which each student advances just as fast as his time permits.

The American School of Correspondence, from their Chicago Office, are offering courses in various building lines at very attractive rates. Their offer to our readers can be obtained by writing to them and mentioning **THE NATIONAL BUILDER**.

Gripping and Stretching Wires.

A long felt want in the electrical supply trade has been most aptly supplied by a very ingenious set of grips for stretching wire, recently brought out by the Smith & Hemenway Co., Inc., 154-6 Chambers St., New York, manufacturers of the well known "Red Devil" brand of hand tools.

This set, which is very complete, includes grips for stretching both smooth



The Smith & Hemenway Grip for Pulling and Stretching Wires.

and barbed wire, whether of copper or steel. The grips are powerful and compactly made and demonstrate once again the careful thought and study that this progressive firm are giving to the many tool problems that daily present themselves.

The illustration given herewith shows their No. 571 grip which will stretch wires from No. 6 to No. 0. This style of grip is made with either pulley or loop.

We have no doubt that both the hardware and electrical supply trade will find these grips popular sellers.

A Notable Birthday

On September 21st, Mr. Edward C. Simmons, for many years president of the Simmons Hardware Company, celebrated his seventy-fifth birthday.

Since the age of fourteen, he has been actively engaged in the hardware business, rising rapidly from a clerkship to that of a partner and finally to the presidency of the Simmons Hardware Co. in

Get H-L-F Lumber Prices without bill of materials

A BIG HIT

Get our price on H-L-F Stud and Wall Board

Better than back plaster at 25% to 50% less cost. The double dead-air space keeps in the warmth, keeps out the cold. This patented H-L-F construction is easy to use. Everything furnished exact size.

Get a price on this construction for the jobs you're figuring on. We ask no royalty—furnish materials at our usual low prices.

Write for prices today



Let us help you plan houses

Send 10c for the H-L-F Prize Plan Book of over 100 good homes. See what original and thorough plan work we do. Complete blue prints, plans, specifications and delivered quotation on any plan in the book,

\$2. Special plans at very small charge.

Send 4 cents for H-L-F Barn Builder's Guide. Shows latest ideas in barn designing and construction.

The H-L-F Silo Folder tells about our wonderful new double wall freeze-proof silo. Price half that of stave silos.

The H-L-F Millwork Catalog is a book of real bargains.

Send the coupon today indicating with an X just what you want

Hewitt-Lea-Funk Company

Not in any trust or combine—Capital \$1,000,000
309 Crary Building Seattle, Wash.

Send for H-L-F House Pricer **FREE** to you.

Here's another big H-L-F idea! When you want a lumber estimate quick, don't wait to take off bill of materials—but use the H-L-F House Pricer.

Its use will enable us to send you by *return mail* our delivered price on lumber, millwork, hardware and paint. We guarantee enough of everything. Nothing overlooked. **NO EXTRAS.** Your profit insured.

Carpenters and contractors who have seen the H-L-F House Pricer, are delighted. It's a wonderful time saver—something you have always needed. Use the coupon and send for the H-L-F House Pricer today.

Prices still low—shipments double quick

The low summer and fall schedule of prices still in force. Our prices underbid everyone else, because we control the forests and mills—sell you direct—no middlemen. Every day we're saving carpenters and contractors high as \$200 on bills running from \$600 to \$800. That's going some! Means double profits for the contractor.

Shipments take only two or three weeks in transit. We guarantee grades, satisfaction, full count—allow you to see lumber before accepting. Get our proposition to you.

Use the coupon today.

Hewitt-Lea-Funk Co.
309 Crary Bldg., Seattle, Wash.

Gentlemen—Please send me the following:

Approximate cost of H-L-F Stud and Wall Board construction for house I intend to build. Width of house _____ ft., length _____ ft.; height of walls _____ ft.; No. of outside doors _____; No. of windows _____

Prize Plan Book (send ten cents.)

Barn Builder's Guide (send four cents.)

Delivered, freight-paid price on enclosed list of materials (no charge.)

H-L-F House Pricer (free.) Plan Sheet (free.)

H-L-F Silo Folder (free.) Millwork Catalog (free.)

Freight-paid price H-L-F Silo. Diameter _____ ft., height _____ ft.

Name _____

Street or R. F. D. No. _____

Post Office _____

State _____

Business _____

PASTE THIS DOME WRITE TO ADVER-



ON LETTERS YOU TISERS. IT HELPS.

Waterproofed Parquetry

By recently invented equipment we treat with a waterproofing mixture the cloth on underside of all our Parquetry Borders which tends to prevent the material from taking up moisture by contact from beneath. Sample will be sent on request.

Ask for Estimates and Book of Designs

The Interior Hardwood Co.
Indianapolis, Indiana.



THIS COLONNADE

Only \$13.75

In Yellow Pine

Oak or Birch \$14.50

Any size up to 8 x 8. Columns 6-inch diameter tapering to receive 5-inch compo. cap. Casings and cap trim not included.

THIS is positively the best Colonnade for the price in the market today. Take advantage of this special offer. Quality, satisfaction and safe delivery guaranteed. Order today. Give exact width and height of opening. State what kind of wood.

Our catalog No. 35 shows many new designs. Write for it.
Bertelsen Adjustable Grille Co.
615-617 So. Clinton St., Chicago

Easy-To-Make FURNITURE

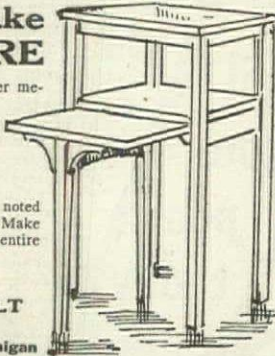
Every cabinet maker, carpenter mechanic, manual training teacher and student should have a copy of our big portfolio, 100 designs, drawn to scale, the work of recognized progressive designers.

This portfolio covers designs noted for simplicity of construction. Make one piece and save cost of entire portfolio.

Price only \$2.00 postpaid.

CRATER & HOLT
41 National Ave.

Grand Rapids - Michigan



WE have two interesting catalogs of valuable information for architect, carpenter and builder on wood columns for exterior and interior use.

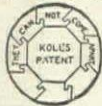
Catalog "T. 40" Exterior and Interior Columns

Catalog "T. 50" Interior Columned Openings
(above sent free on request)

HARTMANN-SANDERS COMPANY

Exclusive Manufacturers of

**KOLL'S
LOCK
STAVE**



**PATENT
JOINT
COLUMNS**

Suitable for Pergolas, Porches or Interior Use

2155-87 Elston Avenue : Chicago, Illinois

New York Office: 6 East 39th Street

Pac. Coast Fact.: A. J. Koll Planing Mill Co., Los Angeles

1874. Through his energetic business principles, the Simmons Hardware Co. now has six local houses, located in different parts of the country and doing business in every country in the world.

His guiding principal has always been that it was the jobber's first duty to help his customer to prosper. This has been accomplished partly through the courtesies he was able to extend, but not a little was due to the excellent quality of the materials made and sold by the Simmons Company. It was through his efforts that the "Keen Kutter" brand became widely known and distributed.

Modern Barn Plans.

There is a story of The Town Fool who found the lost horse. His idea was to imagine he was a horse and do what his imagination led him to. In the building of barns, it would seem that most carpenters imagined they were cattle from the number of "bulls" they make in barn planning and design.

The Louden Machinery Co., 5601 Fourth St., Fairfield, Iowa, have made a careful study of farm problems and the result is a valuable book of barn plans, giving working drawings for barns of various styles and sizes. It contains numberless suggestions for planning, showing the conveniences required, capacity, storage room, and methods of conserving the health of the stock as well as doing the barn work.

A special department of the Louden Machinery Co. will advise contractors and builders regarding farm problems and when requested will prepare complete plans showing the construction, etc., of the buildings in question.

Those of our readers who are interested in this subject should obtain from the Louden Machinery Co. full details of this service as well as the new book of barn plans.

Building Bargains.

Every little while the contractor or carpenter wants to get some piece of mill-work a little bit better or a little bit different from anything else. Then, again, he wants to economize in the purchase of these same materials.

If he is compelled to shop around from

Advertisers' Section.

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Trade Mark Registered U. S. Pat. Office No. 94745

A Money-Saving Repair Material

That hurry up repair job—he wants it cheap, and quickly. Compo-Board is the answer.

Of course Compo-Board is the best wall lining you can find for a new building. But for the repair job where speed is essential, you can "deliver" best by finishing walls, partitions, etc., with Compo-Board.

You can get exactly the amount you need, in strips 4 feet wide and up to 18 feet long. No waste—no muss from plastering and no waste of valuable time. The decorator can take a room the day you are through with it.

The corner of this advertisement shows the construction of Compo-Board, the "Wood-Core" wall board. It is non-porous, hence resists temperature changes and fire very well. And the chances are it will outlast the rest of the finishing woodwork.

Sold by dealers almost everywhere. Send for booklet and free sample. Test it yourself.

Northwestern Compo-Board Co.
5776 Lyndale Ave. No.
Minneapolis :: : Minn.

QUARTERED OAK WALL BOARD

WE are now making NEPONSET Wall Board in an improved quartered oak finish; this, in addition to our original finishes. We should like to send samples of this to any carpenter or builder who will write in for them.

NEPONSET WALL BOARD

is the most practical wall board on the market for you to handle. It is the only wall board which requires no further decoration, that has surfaces waterproofed to prevent absorption of moisture and buckling.

As far as appearance goes, if you do not think *it is 100 per cent better looking* than any other substitute for laths and plaster on the market write in for a sample.



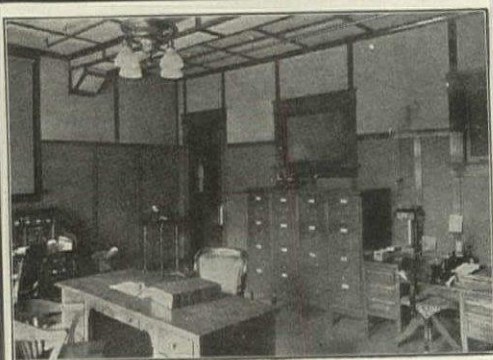
BIRD & SON Established 1795
310 River Street, East Walpole, Mass.
New York Chicago Washington
San Francisco Can. Plant and Office, Hamilton, Ont.

..... COUPON

BIRD & SON
310 River St., East Walpole, Mass
Please send your prices on NEPONSET Wall Board, also a sample of the new quartered oak finish.

Name.....

Address.....



Roberds Ideal Wall Board

For Permanent Satisfaction

UNLIKE many substitutes for lath and plaster, Roberds Ideal Wall Board is not a make-shift, but it is a substantial, time-tried and thoroughly practical interior finish that does not shrink or bulge, does not pull off or warp. It goes on in a truly workmanlike manner and stays where you put it. Properly applied it makes the most handsome, durable and permanent form of interior finish. Our proposition to contractors makes this a most profitable line to handle. Write for territory, booklet, samples and prices.

THE ROBERDS MANUFACTURING CO.
104 RAILROAD STREET, MARION, INDIANA

PASTE THIS DOME
WRITE TO ADVER-



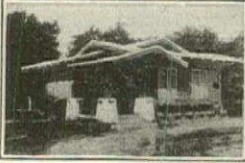
ON LETTERS YOU
TISERS. IT HELPS.

An Opening for a Mortise Lock Can be Cut in Two Minutes by using the Miller Door Mortiser

Little labor is required, and a perfectly true job is assured. Makes no difference what thickness the doors are, the device works true on them all. Complete with five cutters, covering locks from 1/2 inch to 1 1/2 inches thick. A real time and labor saver. Sent subject to trial.



A. W. Miller Mfg. Co.
Riverside, Calif. Cincinnati, Ohio
Our Butt Mortiser and Rule Gauge for 75 cents, Postpaid



Egyptian Stucco Bungalows

The last word in bungalows! Halftone photos, floor plans and interior details. Your money back if not satisfied. Send 50c coin or stamps to

Egyptian Method Construction Co.
Marsh-Strong Building, Los Angeles, Cal.
Special Price to Contractors on Plans



Only \$12.95 for this Yellow Pine Colonnade
Oak, Chestnut or Birch, \$14.50

This is a special offer made to draw your attention to our full line of colonial columns, composition capitals, columns and panelled pedestals.

Contractors and Builders

will find it to their interest to take immediate advantage of our special introductory offer. We carry in stock a full line of colonnades and columns. Prompt shipment and quality guaranteed.

Write today for prices on your requirements.

The Booth Column Company
464 Buckeye Street Toledo, Ohio



PETERSEN'S Home Builders' Plan Book

Revised, Enlarged and up to date

Shows many fine Residences, \$1000-

\$6000. Bungalows, \$500-\$2500. Cottages, \$1000-\$3000. Complete blue print drawings, working details, specifications and list of material at reasonable prices. Get this handsome Home Builders' Plan Book. Send 50c coin or stamps. Special plans also made from your ideas.

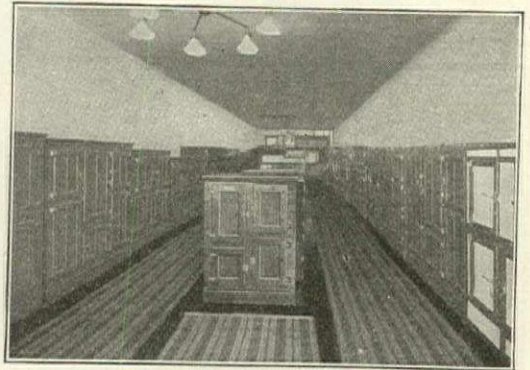
JENS C. PETERSEN, Architect
812 State Bank Bldg., Traverse City, Mich.

place to place until he finds what will meet his needs, he has a hard time of it and loses money by it. If, however, he has the new catalog of the Gordon-Van Tine Company, the chances are he will find just what he wants listed among the bargains they offer from time to time. It is well to keep on the mailing list of this progressive company so as to be posted not only on what is new but on the special bargains which they offer at frequent intervals.

McCray Salesrooms

Its rapidly increasing business has made it necessary for the McCray Refrigerator Company to enlarge its display rooms in Chicago, and the new salesrooms recently opened at 1000 Michigan Boulevard contain one of the largest and most attractive exhibits of high grade refrigerators ever made in the United States.

Located just south of the Blackstone Hotel on Michigan Boulevard, the new McCray salesrooms are convenient both



The Chicago Salesrooms of the McCray Refrigerator Company.

for residents of Chicago and visitors to the city. The handsomely arranged display windows on this famous boulevard have attracted unusual attention.

It is a model refrigerator show-room in every respect and creditably displays one of the largest and most complete exhibits of refrigerators ever made in a great variety of sizes and designs for every requirement.

The contractor who is interested in progressive, up-to-date methods should not fail to visit this interesting exhibit as it shows the very latest designs and

Advertisers' Section.

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Here's A Rattling Combination

When a Keen Kutter chisel and a Keen Kutter oil stone come together—that's a combination of real quality. You ought to have both in your kit. An outfit of Keen Kutter chisels is the best, for they're made for hard work and long use. The



KEEN KUTTER

trade mark means that the dealer is authorized to refund the money for any piece that bears it if not satisfactory.

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

Trade Mark Registered. —E. C. SIMMONS.

If not at your dealer's, write us.

Simmons Hardware Company
St. Louis, U. S. A.



Oil Stone, No. KM8
Price \$1.25

Chisel No. KSM
Price \$0.65

Straight Talks on Durametal Weatherstrips

- ¶ You contractors, carpenters and building owners—why not buy weatherstrips direct from the manufacturer and do your own installing?
- ¶ By our unique plan we have cut out the usual big selling expenses, which enable you to buy direct from us, make a profit on the strip and good money on the installation, besides.
- ¶ Durametal Weatherstrips have been successfully sold for over 10 years and have stood every possible test. Their durability and simplicity makes them superior to all others.
- ¶ Made of best heavy zinc, and fully guaranteed. Write for samples and prices now, before you turn another page. There's money in this for YOU.

A few agencies open to responsible live local contractors and carpenters

Durametal Weatherstrip Co.
14 East Austin Ave., CHICAGO, ILL.

Several Weeks Under Water Fails to Injure UTILITY WALL BOARD

Read What This Firm Says About UTILITY:

The Heppes Co., Chicago
May 26 Vansickle, Cairo, Ill.,
September 19, 1914

Gentlemen: We think your wall board is the best material that is manufactured for this purpose, as we placed it on an office building in the Drainage District of this city and in 1912 when the river overflowed this district, the water came up into this office about five feet above the floor and remained in there for several weeks. After the water went down, we found that the wall board was damaged very little and all straightened out nicely as soon as it dried.

We expect to use your wall board wherever we have occasion to do so.

Yours truly,

May 26 Vansickle,
(Signed) Per R. G. May

Naturally we do not guarantee Utility to remain perfect under such severe conditions as are

Samples Free—Write Today. Get Utility in your own hands and actually see and test its strength and quality. Just say "Send Utility samples and literature."

THE HEPPESS COMPANY, 4502 Fillmore St., Chicago
Makers Also of Flex-A-Tile Asphalt Shingles, Asphalt Paint and Asphalt Roofing in Any Finish

mentioned in the above letter. But we do say this: "Utility is good Wall Board and will give you absolute satisfaction."

Hundreds of tests in years of actual service have proved just how good Utility really is.

Neither Does Heat Affect UTILITY Wall Board

Heywood Brothers and Wakefield of Chicago, furniture manufacturers, line their lumber dry kilns as well as their varnish dry rooms with UTILITY Wall Board exclusively. They now have 40,000 square feet of perfect satisfaction in Utility. The Packard Motor Car Company has many thousands of square feet of Utility because it stands the severest tests of heat, dryness and dampness.

The five layers of asphalt gives the giant strength and durability for which Utility is noted. Utility won't check, chip, crack or come off.

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No Contract too Large
for Capacity of

THE NORTHWESTERN TERRA COTTA CO.

Nor too Small to Receive
Proper Attention

Office and Works:
2525 CLYBOURN AVE., CHICAGO, ILL.

The Only Roof You Can Afford to Consider
for pleasing results and endless freedom from
roof troubles and costly repair bills, is

Red **SHELDONS** Purple
Green **SLATES** Black

The use of any artificial substitute means endless
expense and dissatisfaction. Our booklet "The
Reason Why" tells every reason why *Sheldons
Slates on your roof will put dollars in your pocket.*
Post a postal and get posted.

F. C. Sheldon Slate Co. - Granville, N. Y.

GENUINE BANGOR

This Roofing Slate will answer every
roofing question; it is long-lasting, eco-
nomical and ornamental.

Our large facilities allow low prices and prompt
deliveries of Roofing Slate, Structural Slate and
Blackboards. Write us for details.

East Bangor Consolidated Slate Co.
East Bangor, Pennsylvania

DO YOU KNOW

Mr. Home Builder, that the cellar of your residence
can be made absolutely and permanently watertight
by the simple application of 1" finish of Portland Ce-
ment with Bitu-Mortar Waterproofing Compound
added, over the inside walls and floor?
Let us tell you about our products.

The Bitu-Mortar Waterproofing Company

BITU-MORTAR
WATERPROOFING
WATERPROOFS PERMANENTLY

Engineers, Contractors and Manufacturers
340-342 East 27th Street New York, N. Y.

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ON LETTERS YOU
TISERS. IT HELPS.

newest improvements of the celebrated
McCray line, which has won a world-wide
reputation for superiority.

A Winter's Occupation

There has been a great deal of consid-
eration given to the matter of the ear-
penter, contractor and builder using his
spare time in the slack season and also
during the winter time in profitably oc-
cupying his time. There are thousands
and thousands of houses throughout this
country which have been built without
pocket frames in the window openings
and as a result, when the sash is to be
lifted either a stick must be placed under
it as a prop, or some kind of a nail method
stuck in the side of the sash, allowing
the sash to be lifted from the bottom only
at a given height where this nail again
sticks into an opening in the frame.

All these windows could with a little
expenditure be made to operate—either
the top sash or the bottom sash—as wide
as desired by installing AUTOMATIC
SASH HOLDERS which are inexpensive,
simply constructed and hold the sash
at any place desired. Just a mortise in
the frame or sash, the installation of the
AUTOMATIC SASH HOLDER, replace
the sash and the sash is then ready to
operate up and down and hold securely
at any point. These Holders are manu-
factured by the AUTOMATIC SASH
HOLDER MFG. CO., 48 CHURCH ST.,
NEW YORK, who will gladly furnish in-
formation on request.

The Fuel Question.

At this time of the year, the house-
holder in the North is confronted by the
heating problem. He must keep his house
comfortable and must protect it against
the icy blasts which are sure to come.

The Heating System may be ever so
well designed but unless attention has
been paid to making the windows tight, it
will be more or less of a failure.

The Pullman Metal Weather Strip Co.,
York, Pa., have considered this subject
very carefully and have designed their
metal weather strip to make every win-
dow and door air tight. Their catalogs
show the different styles and sizes as
well as give details of their installation.

The Pullman Metal Weather Strip Co.

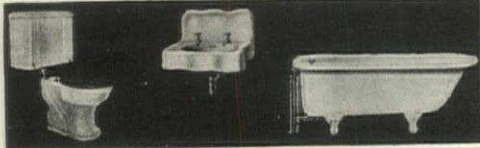
Advertisers' Section.

CARPENTERS, you may not need a STEEL TAPE often, but when you do need one you need it badly, and you need an ACCURATE one, a

LUFKIN STEEL TAPE

CATALOG ON REQUEST

THE LUFKIN RULE CO. Saginaw, Mich.
New York



Everything in GUARANTEED PLUMBING and HEATING SUPPLIES at WHOLESALE

Bathroom Outfits, Sinks, Pipe, Fittings, Valves, Faucets, Heating Boilers, Radiators, Water Pressure Systems and Lighting Plants for Country Homes, etc. Our \$200,000.00 plant behind our GUARANTEE. Send for complete Catalog No. 31.

JOHN HARDIN COMPANY

30 Years at 45th and Cottage Grove Ave., CHICAGO, ILL.

No Cesspool Kills Germs Destroys Odors or Sewer

The safe, the sanitary, the scientific way to dispose of human sewage.

and No Water

This permanent, built-in-the house outfit is refined and comfortable as a water-closet. You can install it in a day. Moderate in price, cheap to maintain. No disagreeable attention required.

Approved by Health Authorities

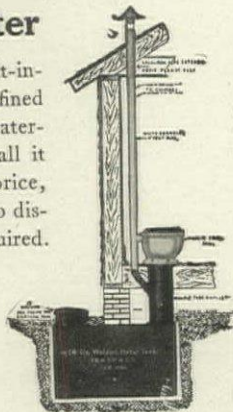
Ideal for Dairies

The Kaustine System

Best for Farm and Village use in Homes, Factories, Schools, Churches, etc.

Write today for descriptive leaflet, and our guaranty and special offer

Kaustine Co., Inc., Ellicott Bldg., Buffalo



We protect all Herringbone with a coat of paint

A COAT of protective paint is now as much a part of Herringbone as the metal it's made of. Heretofore we have painted Herringbone only when requested. Now it's all painted.



This is one more item in the service given to architects, builders and owners by

Herringbone Rigid Metal Lath

With all its advantages a Herringbone house costs but little more than a frame one.

And when Herringbone is used, the walls are fire resisting, ceilings will not crack, discolor and fall. The house will prove an economical one in the long run for your client.

Herringbone gives a firm surface for plastering—insures an even coat.

[No thick or thin spots in the plaster. Herringbone lath prevents cracking or falling]

For damp climates or wherever lath may be subject to corrosion, we recommend the use of Herringbone Armco Iron Lath. Armco is the purest and most carefully made iron produced and resists rust indefinitely.

Get the New Herringbone Catalog

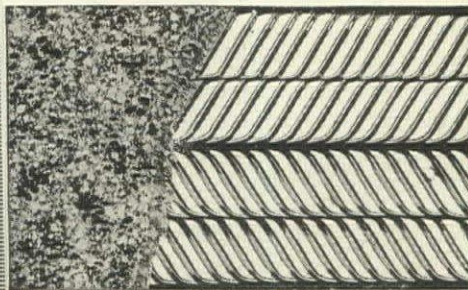
for your files. It gives weights, sizes, and shows applications. With it we will send Fire Test Reports.

The General Fireproofing Co.
611 Logan Ave., Youngstown, Ohio

Makers also of Self Sentering, the concrete reinforcement that makes forms unnecessary.



Trade Mark



PASTE THIS DOME
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TISERS. IT HELPS.

Illuminate with C. K. Sober's Automatic Acetylene Generator



Showing How Retort is Filled

For lighting private residences, public buildings and manufacturing plants, no machine made is the equal of Sober's for simplicity, safety and economy.

Few parts, absolute saving owing to arrangement of making gas. Waterfeed, and seal too; also automatic in operation.

Write us for special prices to builders and catalogue.

C. K. Sober, Lewisburg, Pa.

Gas for Lighting and Cooking

Building contractors can install gas systems in country and suburban homes. The

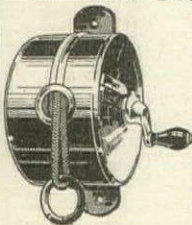
"HERCULES" SYSTEM

consisting of the Hercules Generator and necessary fixtures, gives a light of greater purity and brilliancy than city gas. Costs less to generate and is far safer.

Necessitates only a moderate investment to the building owner and is a profitable side line for the contractor. Write for literature and trade terms.

The Hercules Mfg. Co., 20 Williams St., Chattanooga, Tenn.

EVERY HOUSEWIFE WANTS ONE Barnett Clothes Line Holder



Serves many purposes. Takes very little space. Can be put up in kitchen, laundry, bathroom, back porch, garret, etc. Ready for use in a minute. For drying clothes indoors or out. No knots or snarls in clothes line. When through wind it up and it is out of the way until wanted again. No need to wash off clothes line in Barnett Holder as it is enclosed in a dust-proof metal box, highly enameled finish. Nothing to get out of order. Has 36 feet of stout braided cord. Easy to put up. Can use all or part of line. Tested and approved by the Good Housekeeping Institute. Low in price. Send for circulars.

Agents Wanted—Big profits. Every woman will buy one. Write today for terms and exclusive territory.

Jos. R. N. Barnett Co. - Riverside, Iowa

The GALE CUPOLA



A perfect ventilating system that costs little and is suitable for all buildings. Not affected by storms or birds. Easily installed; no framing, just nail it on.

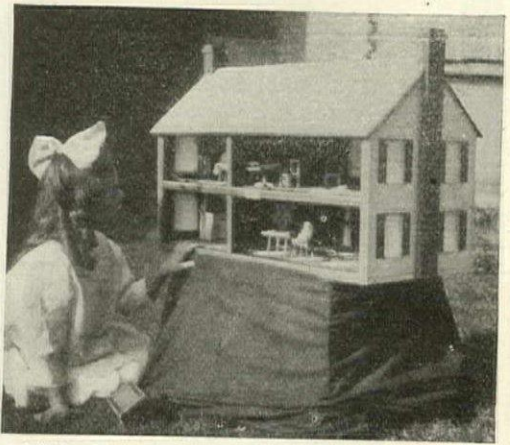
Other styles in catalog; get a copy.

Galesburg Sheet Metal Works
142 So. Prairie St., Galesburg, Illinois

advise us that they have a system of co-operation with the carpenter who wishes to install weather strips in the houses in his vicinity. Their proposition to our readers can be obtained by application to the Agency Department of the Pullman Metal Weather Strip Co., while those who are merely interested in obtaining data regarding the weather strips should ask for Pamphlet A.

The Bird Doll House.

It is easy to understand the pleasure which this little girl gets from the unique doll house, made by Bird & Son, 310 River Street, East Walpole, Mass. Aside from its value as shown, it is an excellent representation of the use of Neponset prod-



Little Miss Beatrice and Her Doll House.

ucts. It is essentially a Neponset product, being made practically complete of Neponset Wall Board, the roof being colored to represent Neponset Shingles.

Messrs. Bird & Son advise us that they have met an enormous demand for these houses and that they have been extremely satisfactory to everyone. Our readers can learn from them how to obtain one of these houses for their little ones.

Fall House Painting.

The Contractor who has hustled all summer getting his buildings finished has probably given little attention to the kind of paint which the painter proposed to use. For the contractor it is just paint or just lead or oil. The painter, however, knows that there is a great difference be-

Advertisers' Section.

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Diamond Metal Weather Strips

are the only ones that have removable and flexible features combined in one—investigate.

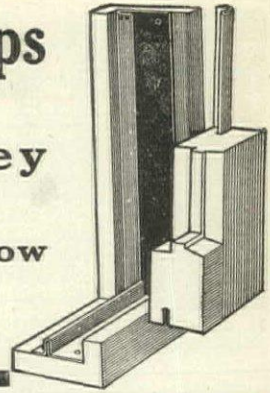
Agents Can Make Big Money

Some valuable territory open for hustlers. We have the best strip on the market for the lowest price.

Get Our Agency Proposition -- Today -- Now

Our booklet "The Diamond Way of Practical Weather Stripping" yours for the asking.

The Diamond Metal Stamping Co., 624 Kear St., Columbus, O.



Gas for Country Homes

Modern independent gas plants for suburban and country homes of all sizes from the largest to the smallest.

MILBURN PLANTS

Make gas which is better than city gas and costs no more. Machines are simple, automatic and durable.

Send for complete catalogue.

The Alexander V. Milburn Co., : Baltimore, Md.



Hammer Insurance SPECIAL

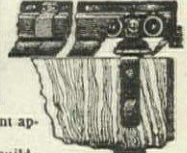
Our "Vandor Vanadium" Nail Hammers—We will send you by Parcel Post for your dealer's name and \$1. These Hammers we insure for life. Made for hard work and lots of it. You can return any time if defective and get a new one. No. 21 1/2, 16 oz. Standard; No. 22, 13 oz. Gen'l Purpose; No. 22 1/2, 10 oz. Finishing; No. 22 1/2, 16 oz. Ripping.

This hammer is warranted to draw anything from a headless brad to a spike.

Drop Forged from the toughest Vanadium Steel. Second growth hand shaved Hickory Handle. Tempered in oil. Easy to work with. Get one to day. **Remember, only \$1 and your dealer's name.** Mail your order NOW.

VAN DOREN MFG. CO., Inc.
(Vandor Dept.) Chicago Heights, Illinois

WAGNER EVER-TIGHT TROLLEY TRACK



—the new track that has met with instant approval of builders and owners.

No brackets—track is forced up tight to building by lag screws. No chance for rain or snow to drive in between track and building. Completely protects hangers and top of door. Nothing else like it on the market—nothing so near to trolley track perfection. Absolutely bird-proof. Impossible for door to come off.

Write for Circular

showing the important features of *Wagner Door Hangers and Trolley Tracks*. Ask your dealer for Wagner Door Hangers and Tracks. If not at your dealer's we will fill your order direct.

Wagner Mfg. Co.

End View

Department E

Cedar Falls, Iowa

The IRWIN Bit

Reg. U.S. Pat. Office

"Stamped on the shank of every genuine IRWIN Bit."

This Trade Mark Means Quality!

YOU want a bit that you can rely on—
one that's right in pattern, right in temper—that bores clean, fast and true.

That's the Irwin. But be sure you get a *genuine* Irwin. Don't be fooled by a similarity in pattern, but look for the trademark illustrated above on the bit.

"Genuine IRWIN cuts true, clear thru."

THE IRWIN AUGER BIT CO., Wilmington, Ohio.



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MEDICINE
Hess SANITARY Locker
CABINETS
The Only Modern, Sanitary STEEL Medicine Cabinet

or locker finished in snow-white, baked everlasting enamel, inside and out. Beautiful beveled mirror door. Nickel plate brass trimmings. Steel or glass shelves.

Costs Less Than Wood
Never warps, shrinks, nor swells. Dust and vermin proof, easily cleaned.

Should Be In Every Bath Room
Four styles—four sizes. To recess in wall or to hang outside. Send for illustrated circular.

HESS, 907 L Tacoma Bldg., Chicago
Makers of Steel Furnaces. Free Booklet.

The Recessed Steel Medicine Cabinet

Hot-Water Heating



For Old or New Houses

We pay freight

Get our Estimate on Your Next Job

BIG BOOK FREE

Profit For Contractors
Our steel boilers and piping systems "cut-to-fit" each job give contractors extra profit and enable them to install the best system made. Ask about our method.

ANDREWS HEATING COMPANY
1455 Heating Bldg. Minneapolis, Minn.

\$239
\$444
\$487



Hot Water Heating From the Fireplace

Cut shows section of our Heating Coil which if placed in any fireplace will heat six times the amount of space without additional cost of fuel and affords the same healthful ventilation. Will suit any fireplace or mantel. Write for descriptive circular.

Heitland Grate & Mantle Co.
No. 128 N. Fifth Street
Quincy - Illinois

tween paints and between leads and oils. His experience has taught him that the lead made by the Old Dutch Process is better than others.

The National Lead Co., using this process exclusively in the manufacture of their materials believe that it is responsible for a large part of their success. To enable contractors and architects, as well as painters, to determine the best color combinations and to prepare complete specification, they have just published their folder A which goes into this subject in great detail.

The National Lead Co. has offices and factories in New York, Boston, Buffalo, Chicago, Cincinnati, Cleveland, St. Louis and San Francisco, while their product is handled in Pittsburgh by the National Lead & Oil Co., and in Philadelphia by the John T. Lewis & Brothers Co.

Folder A may be obtained from any of the above addresses and will give a great deal of valuable information regarding paint and painting.

Cornell Board

Every material has its good points and there are places where it can be used to advantage for conditions under which it will give satisfactory results.

When one is looking for a material to withstand the extreme conditions, however, a great many materials otherwise good, are eliminated.

Cornell Board is designed for covering walls in place of plaster or boarding and consists of slabs of wood fiber, carefully manufactured, which produce an ideal material for this purpose. It can be ob-

Advertisers' Section.



Pence Portable Swing Saw

Well mounted on trucks. With or without engine. Light and easily moved. Designed especially for transportation from job to job. Equally handy for shop work, and a great time and labor saver.

Used in Summer for Framing; in Winter for Post, Pole and Cordwood Sawing

Dealers' Discount allowed to carpenters and contractors in towns where we are not already represented by a dealer.

W. H. Pence, 609 W. Briggs St., Fairfield, Iowa

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**Winter Needn't
Stop You From Working!**

When it is too cold to work outside, come in and help meet the demand for hand-made art craft furniture, built-in sideboards, kitchen cabinets, and all kinds of household conveniences. On the work requiring fine finish use a

STARRETT SCRAPER

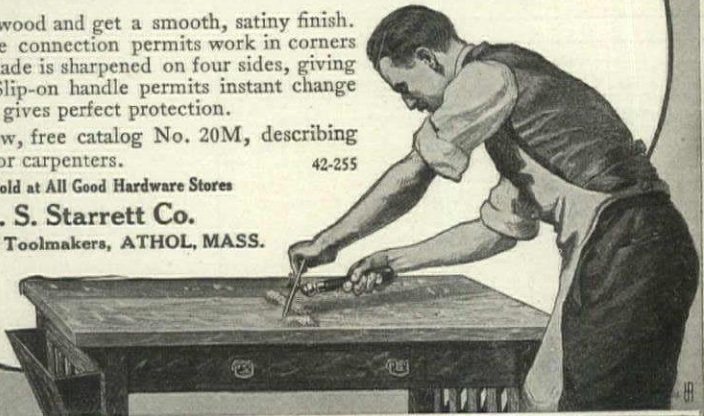
You can use it on any wood and get a smooth, satiny finish. Ball and socket handle connection permits work in corners and narrow places. Blade is sharpened on four sides, giving eight cutting edges. Slip-on handle permits instant change from edge to edge and gives perfect protection.

Send for big, new, free catalog No. 20M, describing Starrett Tools for carpenters. 42-255

Our Tools Are Sold at All Good Hardware Stores

The L. S. Starrett Co.

World's Greatest Toolmakers, ATHOL, MASS.



SARGENT

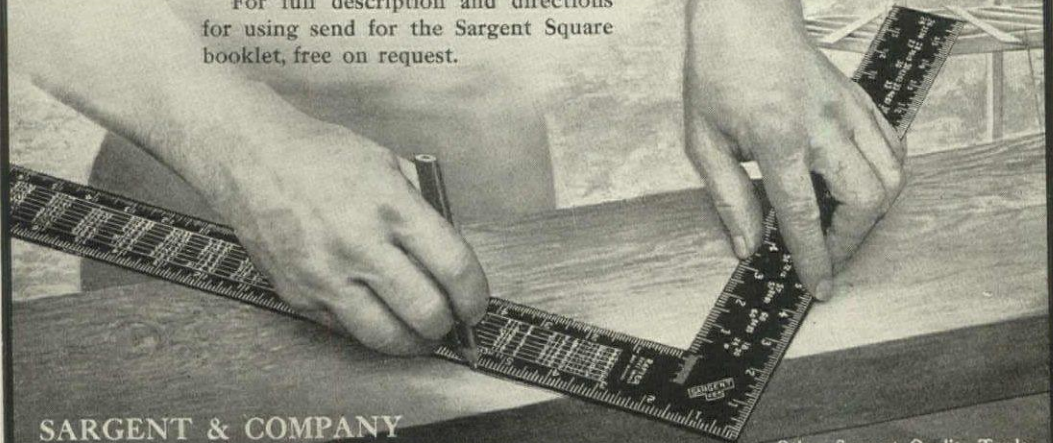
OUR new Rafter Square, No. 500R, is the most complete Square ever made for the carpenter.

It contains accurate measurements for all kinds of rafters, common, hip, valley, jack and cripple—in the most convenient form.

These measurements are all given on the Square; they are complete, correct and final. They save the trouble of multiplying and dividing and then obtaining a result about which there is some doubt.

Simple and easy to use. A great time saver.

For full description and directions for using send for the Sargent Square booklet, free on request.



SARGENT & COMPANY

Makers of Squares, Planes and Mechanics' Tools

1151 Leonard St. New York

Other Sargent Quality Tools are described in the Sargent Tool Book, a handbook for mechanics, sent on application.



A Hot Air Furnace

you ought to know about. Costs no more than a base burner, heats twice as much on about the same amount of fuel. No pipes, no lost heat. Brick or portable. Write and learn.

American Bell & Foundry Co.
Northville, Michigan

Saved by buying a
\$50 BOVEE ECONOMY FURNACE \$50
At Manufacturer's Prices



Has a large combustion chamber. Saves one third of the fuel. Has perfect Ventilating System

The Most Perfect Hot Air Plant Sold

Send pencil sketch of floor plan for our manufacturer's price and illustrated catalog.

Bovee Furnace Works
60 8th Street Waterloo, Iowa

Marvel Cellar Chute

Burglar proof. Protects walls. Indestructible. Fine appearance.

Special dealers' discount to you if we have no dealer in your town. Send for Leaflet "N."

Made of steel, in seven sizes.

Size 16 x 22 in., 9 in. wall, \$8.00 delivered anywhere.



Open for Business

Interstate Manufacturing Co., Oskaloosa, Iowa
Marvel Wrot Iron Furnaces Pay Dividends



FULL LINE of PLUMBING and HEATING SUPPLIES

Sold Direct at Wholesale Prices
20% to 40% Saving

Complete bathroom outfits, tubs, closets, lavatories, kitchen sinks, etc. Prompt shipment from a complete stock. The only house selling up-to-date, guaranteed goods at wholesale direct. Write for illustrated catalogue and prices.

B. Y. Karol, 768-72 West Harrison St., Chicago, Ill.

tained in thirty-two and forty-eight inch widths, in even foot lengths from six to sixteen feet. When specially ordered, it can be had in other widths and lengths.

The Cornell Wood Products Co., Cornell, Wis., which manufactures Cornell Board, controls the entire process of manufacture from the forest to the shipping room. This guarantees a uniform product of the highest quality, as well as insures the prompt shipment of orders.

The Cornell Wood Products Co. have extremely interesting literature showing various methods of using Cornell Board as well as photographs showing where it has been used. Our readers can obtain this literature free on request.

Sanitary Medicine Cabinets.

No modern house is considered complete without a medicine cabinet located where it can be easily reached in emergency. These cabinets, formerly made of wood, have been largely supplanted by those made of metal and instead of being made at the mill or on the job from any pieces of left-over moulding, they are now a part of the equipment of the building and come in beautifully designed styles and sizes.

The Hess Company, 907L Tacoma Bldg., Chicago, Ill., make a complete line of these cabinets, both for installing in new and old buildings. Their illustrated circular shows the various styles and sizes in detail as well as gives the prices. It will enable our readers to allow sufficient space in the wall for them and to arrange for them when designing as well as when erecting the building.

Tapered Asphalt Shingles.

It is apparent to everyone that the hardest wear on a shingle comes at the butt, while the head is practically free from any wear whatever. What is more natural, therefore, than to so construct an asphalt shingle that the butt will be thicker than the head and thus secure the maximum wearing quality with the minimum amount of material, and consequently of weight and cost.

This is exactly what the Winthrop Asphalt Shingle Co. are doing in their factory at 102 Sixty-first St., Argo, Ill.

Advertisers' Section.

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TISERS. IT HELPS.

Here's **YOUR** Chance

A Remarkable offer to men in the building trades.

Go After the Big Jobs!



"Be the Man Who GIVES Orders."

If you have never had the advantage of a technical training, this is YOUR opportunity.

The Chicago Technical College

is making this great offer to practical men in the building trades because it knows that there are thousands of these men who cannot enter the day and evening classes in the college.

We have hundreds of Builders, Contractors, etc., in regular attendance at the college in Chicago. You can study at home the same practical blue print plans and instructions that our Chicago students study. The same experts—Chicago's leading Architects, Engineers, Estimators and Contractors will be **your** instructors. As a "Chicago Tech." student you can consult them at any time, free.

STUDY AT HOME—OUR SHORT, COMPLETE HOME-STUDY

BUILDERS' COURSE FOR PRACTICAL MEN

Your spare time is enough. The "Chicago Tech." method—our new, easy, quick plan will qualify you in a short time.

Plan Reading, Estimating, etc. Architectural Drawing, Specifications, Contracting

The "Chicago Tech." method is to train for immediate work in the Architectural and Contracting fields—NOT to sell books. "Chicago Tech." students do not study from old-time plates in books, but from live, up-to-date blue print plans of buildings now being built or recently completed. These blue print drawings are furnished free with the course. No other correspondence course in America offers this advantage, and it is the only course that has an actual educational institution back of it. Write today. Never mind the cost; that is a small matter, anyway.

Take the forward step. Better things are in sight. Mark and mail this Coupon NOW!

WE FURNISH FREE A COMPLETE \$15.00 DRAWING OUTFIT

Mark "X" opposite work in which you are interested. Without obligation on you we will send full information free.

- | | |
|---|--|
| <input type="checkbox"/> Architectural Drafting | <input type="checkbox"/> Building Superintendence |
| <input type="checkbox"/> Builders' Course | <input type="checkbox"/> Structural Steel Drafting |
| <input type="checkbox"/> Estimating | <input type="checkbox"/> Structural Steel Design |
| <input type="checkbox"/> Plan Reading | <input type="checkbox"/> Reinforced Concrete |
| <input type="checkbox"/> House Planning | <input type="checkbox"/> Machine Drafting |
| <input type="checkbox"/> General Contracting | <input type="checkbox"/> Machine Design 1018 |

ALL BLUE PRINT PLANS FREE WITH THIS COURSE

Name.....

Address.....

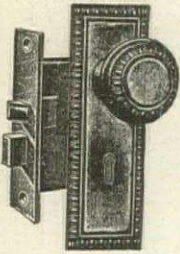
Town..... State.....

College or Home-Study Course.....

Chicago Technical College

1018 LAKE VIEW BUILDING, CHICAGO, ILL.

PASTE THIS DOME  ON LETTERS YOU WRITE TO ADVERTISERS. IT HELPS.



34c for this Lock Set

No. 5311 Antique Copper Finish

FREE Builders' Hardware Catalogue and net Price List to contractors and material men. Easiest to select and buy from.

We do not sell to carpenters or contractors in Cook County, Illinois.

REHM HARDWARE CO.
1503 Blue Island Ave., Chicago, Illinois

The Asphalt Shingles are made by a special process in such a manner that the wearing surface is very much thicker than the portion which is covered up.

This is only one of the features of the Winthrop Asphalt Shingle which makes it a desirable roofing material. The various other points about its construction and other qualities are shown in a booklet which the manufacturers are willing to send to our readers on request.

Wagner Studding Sockets.

The problem of attaching studding and other framing lumber to a concrete floor led the Wagner Manufacturing Co., Cedar Falls, Iowa, to design their Studding Sockets. These consist of a steel frame intended to be built into the concrete in such a manner that they are held securely. They then serve as a socket or footing for the studding or other framing timbers which it is desired to hold in place. The socket being firmly fixed in the concrete prevents the stud from moving, while there is no tendency for dry rot or decay at the end of the stud.

A descriptive folder showing the construction of these sockets, giving prices and methods of use, can be obtained from Department E of the Wagner Mfg. Co., Cedar Falls, Iowa.

A Wall Board Proposition

Only a few years ago the first acceptable substitute for lath and plaster was offered to a skeptical public. Because of their very manifest economy, not only in first cost but also in time and labor involved in applying them there was a fairly generous market for these goods from the very start.

The conservative builder, however, was not induced to accept the new product for the better class of work until it had proven its merit and its permanency by years of actual service. So universal has been the satisfaction afforded by the better grades of wall board that there is probably not a community of any importance in the United States in which this commodity is not recognized and regularly used by the architects and builders. There is not a community of this kind in which there are not frequent calls on the part of the consumers for wall board.

Advertisers' Section.



THE QUESTION—

What can I do when not working a few weeks or a few months?

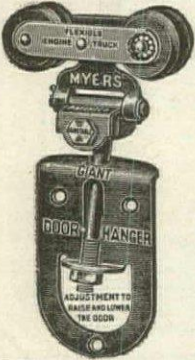
THE ANSWER—

Sell Evergrip Gliding Casters and make **more money** than when working at your trade—**much more!**

J. R. Stretesky, a carpenter of Bonne Terre, Mo., made in 24 working hours \$51.00. Can you beat it? Hundreds of other carpenters doing as well—some better.

Send for a **Free Trial Set** and particulars showing no capital required.

STRANSKY MANUFACTURING CO.
Dept. R, 20 Warren Street, New York



MYERS GIANT

and New-Way Adjustable Tendem Door Hangers

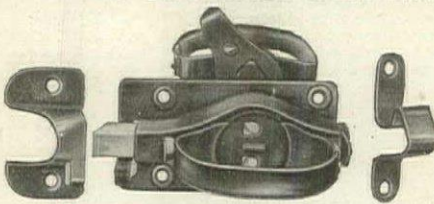
PATENTED

For Tubular Girder Track

Are adjustable up or down, and in or out. Trolley Wheels are heavy turned steel, revolving on steel roller bearings, and run inside the tubular girder track. Not affected by rain, sleet or ice. Write for descriptive circulars and prices.

F. E. MYERS & BRO.
ASHLAND, OHIO

Whitcomb Steel Barn Door Latch



Over 13,000 Dozen Sold Last Year

A strong, durable, convenient latch, adjustable to doors of any thickness; will not catch harness. Two large handles permit opening of doors from either side. Each latch provided with two catches to hold door open and closed. Also arranged for use of a padlock.

Albany Hardware Mfg. Co., Albany, Wis.

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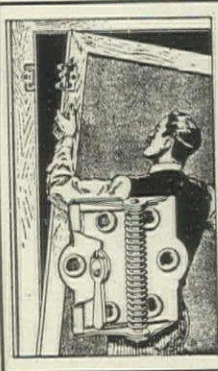


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Investigate—Consider—Buy
The King Dumbwaiter

BECAUSE you get an A1 machine made of all carefully tested grey iron castings;
 AND you will get the result of years of thorough experience, such as double leading sheaves or pulleys; they take up the noise.
 BESIDES, every King Dumbwaiter is equipped with the latest improved King Check for holding a load at any point.

Send us size and depth of well hole and we'll gladly quote you
 Wm. F. King, 19-21 Kingsland Ave., Brooklyn, N. Y.



The "Jiffy"
Quick-Detachable
Screen Door Hinge

Door can be lifted away by simply lifting the small release lever. Most perfect detachable screen door hinge ever invented. Made in Japan, oxidized copper and brass finish.
 Neat, strong and mechanically correct. Write us for samples and prices.

Rock City Mfg. Co.
 Wabash, Ind.

O.K. METAL WEATHER STRIP

Shuts out the cold, dirt and dust without shutting out the air. Is entirely concealed and is a permanent fixture. Stops sash rattling and is practically indestructible. Costs less than a storm window, is far more convenient and never needs attention or replacing. Made for all window or door requirements. Estimates submitted. Good territory open for agents. Write for booklet and samples.

O. K. Metal Weather Strip Co.
 Madison - Wisconsin

Build For An Income

Buy a Plan Book of Flat Buildings and plan an income in your old age. Our book gives you ideas from two-family flats to twelve families, and our prices are reasonable.

First edition (right off the press) . . . 50c
 Also a book for residences . . . 25c
 Both . . . 65c

H. COOK & COMPANY
 720 Ashton Bldg., Grand Rapids, Mich.

Save 50%
 on Your Building
Material Bill!

NO shrewd Contractor or Builder can afford to be without our newest catalog of guaranteed Millwork and Building Material. It's the best thing of its kind ever published. Has 3,000 superb illustrations and 8,000 dollar-saving prices—Buy your material from us, we ship direct to you and there are no jobber's or middleman's profits to pay. We sell at wholesale, guarantee satisfaction and safe delivery.
 H. B. MUNGER, Pres.

8,000 BARGAINS

Everything in Lumber, Flooring, Doors, Windows, Mouldings, Porchwork, Building Paper, Hardware, Tinwork, Roofing, Paint—All at wholesale prices! Buy from us direct and you'll save 33 1/2% to 50% on everything you buy.

PLAN BOOK OF MODERN HOMES

Illustrates 50 up-to-date modern houses and barns ranging in price from \$400 up and tells how to secure free blue prints, specifications, itemized bill of materials, complete with price. Our method of furnishing material complete saves 50 per cent

ECONOMY RUBBER ROOFING

in price and 100 per cent in trouble and worry. Get our 2 free books today.



STORM SASH
 Double windows save their cost each season in coal bills. All sizes carried in stock; Clear White Pine Glazed 72c net. Storm Doors \$1.50 net, up. Write for FREE BOOK.

Prices Below



2-ply, 45 lbs., guaranteed 7 yrs., \$1.35
 3-ply, 55 lbs., guaranteed 10 yrs. \$1.60
 Rolls contain 108 sq. ft.

Free from tar. Made from long woolen felt saturated and coated with pure asphalt.

For \$838 We will furnish complete all lumber, shingles, millwork, sash, doors, hardware, spouting, paint—everything except masonry and labor to build 6-room house. Plans free. Design 113.

Chicago Millwork Supply Co.

1423 W. 37th St., Chicago

CATALOG OF 8000 BARGAINS PLAN BOOK

31 41

Fill Out This Coupon Now. Mail It to Us

DATE

CHICAGO MILLWORK SUPPLY CO.,
 1423 W. 37th St., Chicago, Ill.

Gentlemen—Please send your FREE Books checked below, to—

Name.....

Address.....

[]—CATALOG—No. 31 of Building Material
 []—PLAN BOOK—No. 41 House and Barn Plans

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Draw Perspectives —and Earn More Money



Building contractors able to make their own perspectives can increase their profits by effecting a valuable saving in time and money. We teach it *thoroughly*.

As a *business*, this work offers excellent opportunities—men earn big salaries. More offers of positions than graduates to fill them. Write for free prospectus.

School of Applied Art
Dept. N. B. Battle Creek, Mich.



This Pearson's Automatic SHINGLE NAILER

Will Pay for Itself on the First Job

Do your nailing faster than before, and on any pitch of roof. Wear mittens or gloves.

Just throw nails in by the hand—then start nailing. Great for use on stained shingle jobs.

These nailers are made in two sizes—the BLUE nailer for 3d common No. 14 gauge wire nails. The RED nailer for 3d galvanized No. 13 gauge 1 1/4 in. wire nails. Get a Nailer direct from us. \$5 prepaid.

Money refunded if not as represented

Pearson Mfg. Co. - - - Robbinsdale, Minn.

Galvanized Iron Cut Nails



For shingles, slating, boat and wharf building, fencing, sheathing and all exterior work use

Anchor Brand Iron Cut Galvanized Nails

as they will outlast the best of wood under all climatic and weather conditions.

Write for Prices

E. & G. Brooke Iron Co., Birdsboro, Pa.

NEW WAY HINGE

Diehl's Bracket Hinge is just what everybody is looking for to hang their basement windows with, and just what everybody wants. A convenient and labor-saving device.

Handled by all up-to-date dealers. Send for catalogue and prices. Manufactured by

Diehl Novelty Co., Glenbeulah, Wis.



One of the first manufacturers to enter this field and to produce an absolutely reliable and high grade board was the Roberds Manufacturing Company, whose product is well known to most readers of this paper. Roberds' Ideal Wall Board has been an evolution from comparatively light weight board to its present form, consisting of four thicknesses of fiber board united by three layers of asphalt cement. This board is unusually strong, tough and uniform and has been found to be perfectly satisfactory as a substitute for lath and plaster and for purposes of sheathing frame buildings.

Among recent improvements to Roberds' Ideal Wall Board is the development of a special finish which reproduces the natural grain and color of golden oak, quartered sawed. In this form Roberds' Ideal Wall Board meets a growing demand as it can be used for wainscoting, paneling and interior finish, giving an exact imitation of selected hard wood. A single coat of varnish is all that is required to finish a job of this kind so perfectly that it will defy detection by any but the most skilled eyes.

There have recently been some important changes in the organization of the Roberds Manufacturing Company and Mr. Roberds announces that arrangements have been made to enormously increase their output for the coming year. To take care of this increased product Mr. Roberds is making a very interesting proposition to contractors and builders in towns in which his company is not represented. Complete details of this proposition can be obtained by our readers from Mr. Roberds, 104 Railroad St., Marion, Indiana.

Zinc Shingle Nails.

After all is said and done, it is the test of time which really determines the value of building materials. As long as shingles have been used, the life of the shingle was largely dependent upon the nails which held them to the roof. The use of pure zinc nails, such as are made by the W. H. Maze Co., Peru, Illinois, insures that the shingles will attain their maximum life, as there is no possibility of the nails rusting out, breaking off, pulling out, or

Advertisers' Section.

PASTE THIS DOME
WRITE TO ADVER-



ON LETTERS YOU
TISERS. IT HELPS.

otherwise permitting the shingle to become loosened.

The W. H. Maze Co. have made numerous long time tests of their nails and find that they withstand the severest weather conditions without any deterioration whatever. To enable contractors and others to make similar or other tests, they offer to send on request a full half pound box of these shingle nails absolutely free. This is enough to make an exhaustive test and many of our readers have already availed themselves of the offer.

Profitable Side Lines.

There are many carpenters and contractors who want to do a little extra work aside from their regular line. It is difficult to find a more satisfactory solution to their problem than comes through the use of the Evergrip Gliding Casters. These casters are designed to be put on the legs of chairs, tables, beds, bureaus, etc., wherever casters have been formerly used or wherever a piece of furniture is to be frequently moved about on the floor.

The use of these casters eliminates practically all of the noise attending the moving of furniture and prevents the marring of floors and furniture.

The Stransky Mfg. Co., through their Department R, 20 Warren St., New York, N. Y., have a most interesting proposition to make to carpenters and contractors who wish to consider installing and selling these casters during the winter months. Their proposition will be fully described to those who write for it.

Shop Equipment.

The average contractor must keep his shop and jobbing equipment down to the minimum. First, on account of the expense, second, on account of the space it requires, third, on account of the necessity for frequent moving from place to place.

The equipment manufactured by the Slater, Marsden & Whitmore Co., Beloit, Wis., is designed for the busy contractor's use. Their combination rip and cut off saw is large enough for the largest job and still small enough to go on the smaller jobs. It is solidly built to withstand

Advertisers' Section.

This Beats the "YANKEE" No. 30

For overhead work -- any place out of reach--and all ordinary work, the New "Yankee" No. 130 and 131 are better than any tool made for this purpose.



The spring in the handle holds the tool extended in any position -- keeps the bit in the slot -- drives the handle back quickly for the next thrust. To see one is to want it. Let us send you the "Yankee" Tool Book.

North Bros. Mfg. Co.
Department N, Philadelphia, Pa.

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Tools Marked Like This 

D. R. BARTON
1832
ROCHESTER, N. Y.

Last a Lifetime and Give Satisfaction to the End!
The Highest Priced Edge Tools Made
Ask for our catalog, book "True Stories" and "How to Take Care of Tools"—free.

Mack & Company
Brown's Race Rochester, New York

INDESTRUCTO Carpenters' Tool Cases

Stronger than any wooden chest, much lighter, holds tools better, much easier to carry. Same shape as a suitcase when folded and carried like one.

Made of 3-ply veneer, covered with heavy canvas and painted. Edges and corners are bound and reinforced with steel. Two brass catches and locks. Contains a place for every tool. Two sizes—31 in. for 26 in. saws, 33 in. for 28 in. saws. Will last a lifetime. Write for booklet and prices now.



WEDELL & BOERS
157 Jefferson Avenue, DETROIT, MICH.

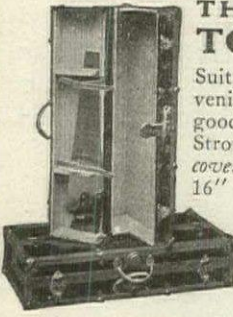
Caldwell Sash Balance



Does away with weight and cords and vastly more durable. Makes sashes work perfectly. Permits greater window space in new work, as box frames are not necessary. May be applied to old windows without altering sashes or frames.

Write for Circular to
Caldwell Mfg. Company
2 Jones St., Rochester, N. Y.

THE ENDEBROCK TOOL CHEST



Suit case shape, compact, convenient and keeps the tools in good shape. Size 34x6x14½. Strongly constructed and steel covered. Space for four saws, 16" Tongue Square, Iron Smooth and Jack Plane, etc. Send \$6.00 and your dealer's name; more details first, if you wish.

Dealers write for particulars of our great agency offer.

F. Endebrook Trunk Co., St. Joseph, Missouri

frequent moving and the heavy work which comes upon it while its price is such that any contractor can afford to own it.

This Company also manufactures a swing saw for shop use which is exceptionally economical wherever there is much sawing to be done. It is adjustable for various purposes and can be driven by either motor or belt.

The complete catalog of the Slater, Marsden & Whitmore Co. will be sent to those of our readers who contemplate equipping a shop or adding to their present outfit.

The Master Slide Rule.

There is only one rule made by which one can measure the inside of a barrel. This is the Master Slide Rule, made by the Dahl Manufacturing Co., 51B East Forty-second St., New York City.

The Master Slide Rule is equally valuable for measuring between window or door jambs or openings of any character where a two-foot rule could not be unfolded or where one would have to lay the rule down twice.

It will be noted that the reading on a Master Slide Rule, whether for an inside or an outside reading, is absolutely certain, it being impossible to misread it.

The Master Slide Rule is made so that it is impossible to use it in any except the correct way, and a locking feature prevents its opening or closing except when it should.

A number of our subscribers have already investigated an agency proposition made by the Dahl Manufacturing Co., and are making good money at it. The proposition is well worth investigating.

The American Sash Trimmer.

A great many of the progressive contractors and carpenters are finding that it pays to have a small but well equipped shop where they can get out special mill-work, frames, sash, etc.

The equipment of a shop of this character requires careful study of the trade to which the carpenter or contractor caters and he must carefully avoid the purchase of machines which, while they will do a limited amount of work along certain

Advertisers' Section.

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Be An Agent for a Rule Every Carpenter and Builder Needs

Improved Interlocking Fool-proof **Master Slide Rule** gives inside as well as outside measurements of doors, windows and everything else instantly and accurately. Strongly made, rust-proof and designed to last many years.

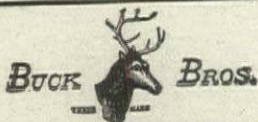
Price 15c per foot, in sizes from 4 to 8 foot lengths. Order a trial rule.

Anyhow learn about our agency proposition. Circular B tells.

DAHL MANUFACTURING CO.
51B East 42nd Street New York City

1853

1914



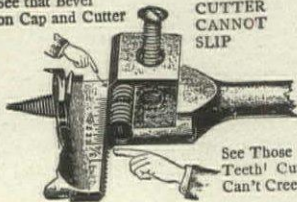
61 Years of Tool Making Behind Buck Bros. Products



Our line of tools includes Gouges, Plane Irons, Chisels, Drawing-knives, Nail Sets, Screw Driver Bits, Carving Tools, etc. Our reputation guarantees them all. Catalog shows them all. Write for it.
BUCK BROS. : : MILLBURY, MASS.

C. E. JENNINGS STEERS PATENT EXPANSIVE BIT

See that Bevel on Cap and Cutter



CUTTER CANNOT SLIP

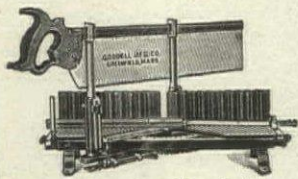
Note Micrometer Screw, by means of which Cutter can be instantly adjusted to a thousandth part of an inch.

See Those Teeth! Cutter Can't Creep

C. E. JENNINGS & CO.
Sole Manufacturers 71-73 Murray St., New York

GOODELL MITRE BOX

Made of Steel — Cannot Break

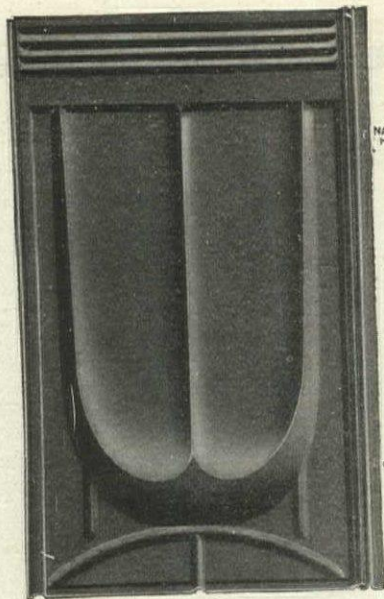


Send for New Circular E

First in Quality & Improvements

New STEEL BOTTOM PLATES with ANGULAR SERRATURES to prevent the work from slipping, and many other special features.

GOODELL MFG. CO.,
GREENFIELD - - MASSACHUSETTS



NAIL HERE

NAIL HERE

Here's the Latest

Edwards "Ohio" Metal Shingle is the latest and best metal shingle production on the market today—barring none. The "Ohio" has a handsome novel design. The clean cut embossing can't be beat.

Edwards "Ohio" Metal Shingle

The beautiful pattern is made in one size only—14x20 inches. Manufactured from the best quality Worcester Grade Terne Plate, painted or "Tightcote" galvanized.

The "Ohio" has the patent interlocking device and every other good feature that has made Edwards Shingles famous.

Shall We Send Samples and Prices?

The Edwards Mfg. Co.
"The Sheet Metal Folks"

430-450 Eggleston Ave., Cincinnati, O.
Largest Manufacturers of Metal Ceilings, Metal Shingles, Steel Roofing and Siding in the World

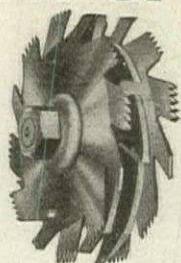
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Perfect Grooves

With or across grain; no screw adjustment; any width grooves.



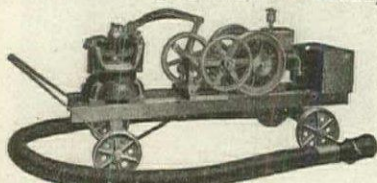
Huther Bros. Dado Head

Sent on approval. Can be used on any saw rig.

Patented Nov. 29, 1892; July 19, 1910

HUTHER BROS. SAW MFG. CO., ROCHESTER, N. Y.

Here's a Special Pump—

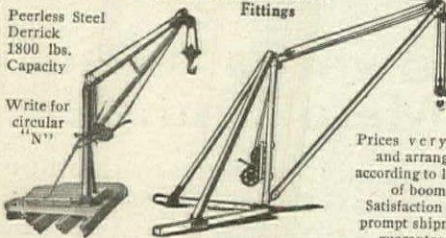


the Bull Dog No. 2—which has a 1½ h. p. Bull Dog engine and a 3-inch pump, the outfit being mounted on a strong truck. For completeness and hard service this equipment is above the average. If you want information on several other styles, simply write for Catalog No. 21.

Bates & Edmonds Motor Co., - Lansing, Michigan

Introducing the New Sasgen 1 Ton Portable Stiff Legged Derrick

Built Strong and Light of all Crucible Steel Fittings



Peerless Steel Derrick 1800 lbs. Capacity

Write for circular "N"

Prices very low and arranged according to length of boom. Satisfaction and prompt shipment guaranteed.

Sasgen Derrick Co., 2053-57 N. Racine Ave., Chicago
Canada Office: 1 Wabash Ave., Toronto

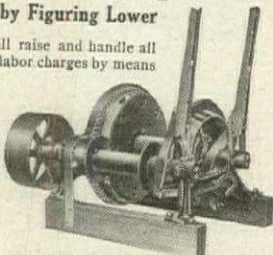
Beat Out Your Competitor!

Land the Building Job by Figuring Lower

The Ireland Geared Hoist will raise and handle all your materials and save you labor charges by means of which you can estimate lower on a job than the other builders in your community.

It is built to stand service and for six years has been giving the utmost satisfaction.

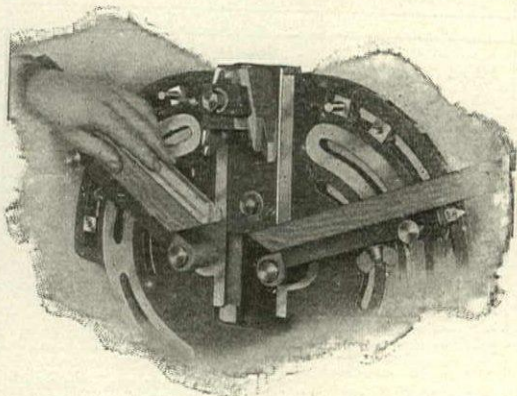
Write us for circulars and prices, describing our various styles.



IRELAND MACHINE & FOUNDRY CO.
41 State Street - Norwich, N. Y.

lines, or while they will do a limited amount of work along general lines, are neither complete enough for intricate and careful work nor complete enough for quantities of general work.

The American Sash Trimmer, however, made by the Heald Machine Co., Worcester, Mass., is designed especially for the manufacture of sash and sash bars. Its use will enable the carpenter to make the most intricate designs without loss of time, while the several attachments which



The American Sash Trimmer in Use.

can readily be placed on the machine, enable it to do a great deal of mitering, mortising and similar work.

The catalog issued by the Heald Machine Co. describes this machine in detail while the manufacturers will be only too glad to send samples which will give an idea of the class of work the machine is capable of turning out. They will also describe in detail their special offer to our readers by which the machine can be obtained on thirty days' approval, to be paid for only in case it fully meets the user's entire satisfaction.

Heating and Ventilating Problems.

The cheerfulness of a grate fire appeals to everyone but in many cases they feel that it is an expensive luxury to maintain, as so much of the heat is wasted by going up the chimney.

Various attempts have been made to utilize a greater proportion of the heat units of the fuel but most of them have been more or less unsatisfactory.

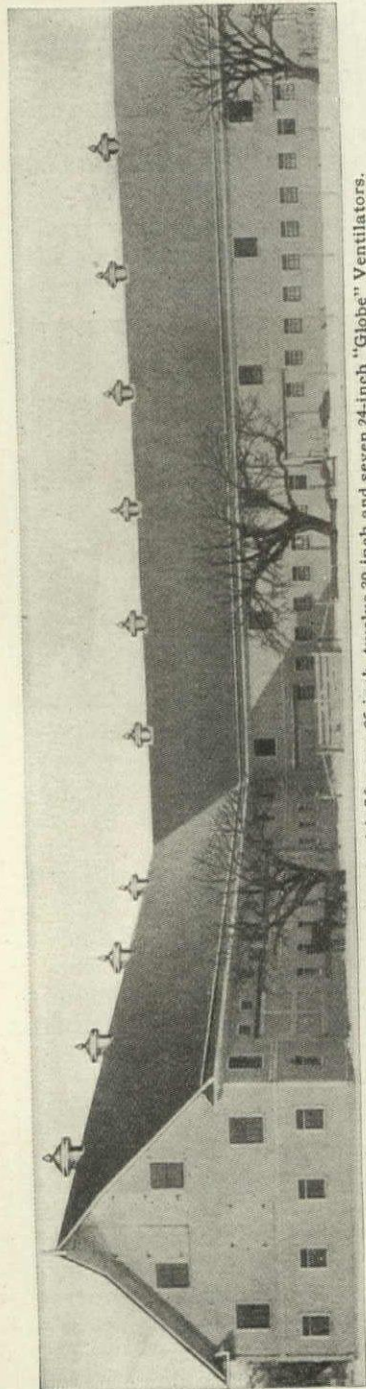
The system used by the Heitland Grate & Mantel Co., 128 N. Fifth St., Quincy,

Advertisers' Section.

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ON LETTERS YOU TISERS. IT HELPS.



Section of one group of barns equipped with fifty-one 36-inch, twelve 30-inch and seven 24-inch "Globe" Ventilators.

"Globe" Ventilators Stand For the Best In Ventilators

Silent, simple, superior, standard, successful and give **AI satisfaction** on barns, residences, factories, etc. Our catalogue Z tells some interesting facts on ventilators. Free for the asking.

203Z River Street, Troy, New York

Globe Ventilator Company

The Stormproof Roof

ABSOLUTE protection from the elements is assured the house roofed with Cortright Metal Shingles.

They interlock and overlap so that no snow or rain, spark or ember can penetrate.

There's no solder used on a Cortright roof and not a nail exposed to the weather. No expansion or contraction from heat or cold can pull it apart, or lightning harm the house under it.

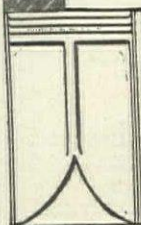
CORTRIGHT Metal Shingles

have all the virtues of other roofings with none of their defects. They last indefinitely and never need repairs.

Contractors and Builders everywhere are recognizing that wood shingles are rapidly becoming obsolete and are dropping them for the stormproof, fireproof, handsome, durable, inexpensive Cortright Metal Shingles.

There's more money for you in Cortright than in wood shingles and you do your client a real service in recommending them. Easy to lay, expert help not necessary. Write today for samples, prices and our interesting new catalog.

Cortright Metal Roofing Co.
Philadelphia and Chicago



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KEES SHINGLE GAUGE

Easily attached to any hatchet. Always accurate. Seven quick adjustments by quarter inches. Won't work loose. Enables you to shingle fast without a helper. Saves using chalk-line or straight-edge. Made of cold-rolled steel, nickel plated.

Send 15c Stamps or Coin for Sample. Your Money Back if You Are Not More Than Pleased.

F. D. KEES MFG. CO.
 BOX 811 BEATRICE, NEB.
 MAKERS OF
 Kees Metal Building Corners, Siding Clips, Gossett Storm Sash and Screen Hangers. SAMPLES FREE.

Ill., has been found to be extremely practical, economical and efficient. This system consists essentially in a combination of a hot water heater in connection with the fireplace, by means of which the fuel and heat which would otherwise be wasted is utilized in warming a hot water circulating system. An additional room or, in fact, a number of rooms can in this manner be heated without additional expense.

The illustration which we show would give one an idea of the value of this system as not only the central living room

The AUTOMATIC BALLBEARING ELECTRIC Floor Surfacing Machine

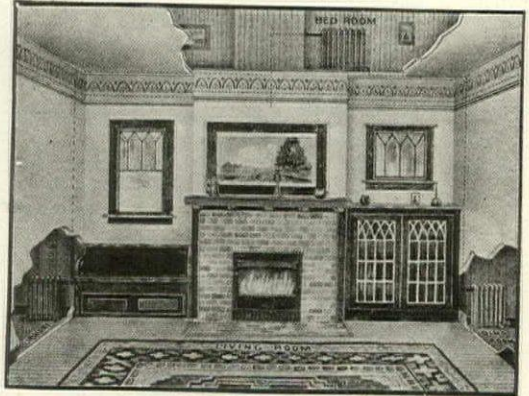


will save you money by rapidly finishing your new or old floors just the way you want them. Self-propelling—you simply guide.

Write today for booklet telling all about the machine, our free trial offer and list of users near you.

Patented Oct. 15, 1912. Made in several sizes.

WAYVELL CHAPPELL & COMPANY
 Dept. C, 4846 E. Ravenswood Ave. Chicago, Illinois



An Interior Showing the Heitland Grate with Auxiliary Radiators.

By all means investigate the **Fox Floor Scraper** before you buy. Interesting booklet of proof of Fox Superiority and low prices on request. Write for it today.



We make a specialty of high-grade floor scraper blades, any pattern or size. Write for low prices.

Fox Supply Company
 Dept. N Brooklyn, Wis.

is heated by the fireplace, but the adjoining library and dining room as well as the bedroom on the second floor are heated by radiators connected through the fireplace.

The Heitland Grate & Mantel Co. have a circular showing this fireplace heater in detail as well as giving prices, sizes, styles and various other valuable information on heating and ventilating.

FREE TRIAL Rapid Floor Surfacer



Made in Three Sizes

M. L. Schlueter
 109 No. Canal St., CHICAGO

The Kees Shingling Gauge

Every carpenter knows how easy it is to carry around a two-foot rule and to space off the courses for shingling. It is almost impossible to break a two-foot rule and you just can't lose one if you try. And then, of course, it is so easy to remember the gauge to which you are shingling and you just can't make a mistake when you put your rule down right.

I hear several carpenters say I have never done any shingling, but they are mistaken, and just because I have, I know

Advertisers' Section.

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ON LETTERS YOU TISERS. IT HELPS.

STEEL SEWED STAY-LOCKED COLUMNS

JOINTS CAN'T OPEN

MADE OF WOOD SEWED WITH STEEL

They're different
Made to last
Cost no more

Write for Catalog F — A beautiful free design book worth owning



AMERICAN COLUMN COMPANY
BATTLE CREEK, MICH.



"I'll tell you what's holding you down"

"It's on headwork that you are short, Jim. You've never learned to do anything better than the other men in the gang. That's what's keeping you down.

"Why don't you learn to figure contracts, lay out work, draw plans, and handle jobs? We never have enough trained men. I've got openings now for two first-class foremen and a competent draftsman."

Probably you, too, are ambitious to make more money—or you want to get into business for yourself as a builder. And you can do it—it's only a question of getting the necessary training.

You won't have to leave your home or give up your job to get this training. The International Correspondence Schools will teach you by mail right in your own home after working hours. They have trained thousands of men for good jobs as contractors, foremen, draftsmen and architects—they can do the same for YOU.

Find out how the I.C.S. can train you for a better job. **Just Mark and Mail the Attached Coupon—NOW.**



Courtney Scaffold Brackets ARE SAFE

They carry a ton—last a lifetime—save enough on two jobs to pay for themselves. Easily and quickly put up and taken down by one man. Our crosshead keeps the scaffold from swinging—no extra charge for this feature.

\$13.50 Per Dozen

for 3-foot brackets, if cash comes with order. To save money, order while this advertisement is in your mind.

AMERICAN STEEL SCAFFOLD CO.
Dept. 7 - - - - - Detroit, Mich.

Build it with

ALPHA THE GUARANTEED PORTLAND CEMENT

and it will be Everlasting

ALPHA PORTLAND CEMENT CO.
General Offices: Easton, Pa.

Sales Offices:

New York Chicago Boston Pittsburgh
Philadelphia Buffalo Baltimore Savannah

NO MONEY IN ADVANCE

5 DAYS FREE TRIAL



John F. Weber, Pres.
Weber Mfg. Co.
661 71st Ave West Hills, Wis.

The WEBER DOUBLE ACTING Floor Scraper

International Correspondence Schools
Box 1332, SCRANTON, PA.

Please explain, without obligation on my part, how I can qualify for the position before which I mark X.

Architecture	Plumbing Inspector
Architectural Draftsman	Mechanical Engineer
Contracting and Building	Pattermaking
Building Foreman	Civil Engineer
Structural Engineer	Surveying and Mapping
Structural Draftsman	Commercial Illustrating
Concrete Construction	Mining Engineer
Law for Contractors	Gas Engineer
Estimating Clerk	Automobile Running
Electrical Engineer	Bookkeeper
Electric Lighting	Stenographer
Plumbing & Steam Fitting	Civil Service Exams.
Heating and Ventilation	Advertising Man

Name _____

St. and No. _____

City _____ State _____

Present Occupation _____

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Miller's Bungalow Plans

are used exclusively in our book, "Bungalows and Other Things," which contains photographs and floor plans of many artistic homes that can be built for \$1,500.00 up. Get this book, it is the best of its kind on the market. Pick out the house you want and we will furnish the plans and specifications for \$5.00 to \$15.00. The book is receiving high praise from contractors and builders. **Price \$1.00**

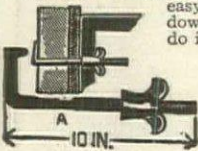
Burd F. Miller Co. 25 Brandeis, Omaha, Nebr.

\$13.95 PER DOZ.

(If You Send Cash With Order)

Absolutely Safe,

for every pair will carry a ton, and there's no wear-out to them. Besides, they're so easy to put up and take down—one man can do it alone and do it quickly.



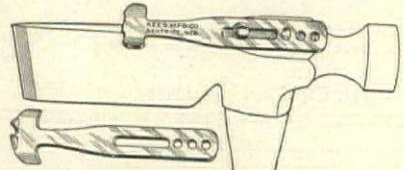
Write for Catalog of Builders' Specialties

James L. Taylor Mfg. Co.
Poughkeepsie, N. Y.

The Taylor Steel Scaffold Bracket

the value of the Kees Shingling Gauge shown herewith.

This little device is attached to the shingling hatchet and can neither come off nor get in the way. It is, however, right where you want it to use as a gauge and a blind man can use it and keep the shingle courses absolutely straight. It only needs to be set once and it is good until



How the Kees Shingling Gauge Is Attached to the Shingling Hatchet.

you want to shingle at a different gauge, when it only takes a minute to change it. I don't have to tell any carpenter how handy it is, for he can see that for himself. It can be had at practically any hardware store or direct from the manufacturer, the F. D. Kees Manufacturing Co., Box 811, Beatrice, Neb.

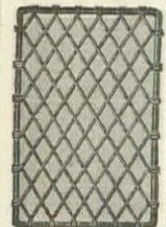
Do You Require Iron Work?

We Manufacture

- Iron Stairs
- Fire Escapes
- Jail Cells
- Balconies
- Fencing
- Stable
- Fixtures
- Marquise
- and
- Light Steel Work

Our Prices Will Interest You

THE MACK IRON AND WIRE WORKS CO.
6 WARREN STREET, SANDUSKY, O.



Are You Going to Build?



Send 25c in silver (and 10c postage) for our big \$1 book of plans. "LOW COST MODERN HOMES," with houses from \$1,000 to \$3,000. "PALATIAL MODERN HOMES" from \$3,000 to \$10,000, price 25c and 12c postage. "COTTAGES AND BUNGALOWS" from \$300 to \$9,000, price 25c and 5c postage.

J. H. DAVERMAN & SON, Architects
1342 Murray Building GRAND RAPIDS, MICH.

The Eastern Builder and the Western Carload Buyer

If you are in the market for any building material, whether it be for inside finish, outside finish, mouldings, doors, stair-stock, siding, etc., for either ordinary or extraordinary houses or whether you are in the market for greenhouse stock, tanks of any description, or in fact "Anything in wood or woodwork," for building purposes it will pay you to get in touch with The A. T. Stearns Lumber Company, 25 Taylor Street, Neponset, Boston.

They have a very complete and up-to-date plant which turns out anything in the line of building material from sill to shingles. They carry a big stock on hand at all times and are in position to make very prompt shipment from either the yards at Boston and also from their yards at Apalachicola, Florida. They are specialists on Florida Gulf Cypress, having introduced that wood into New England many years ago.

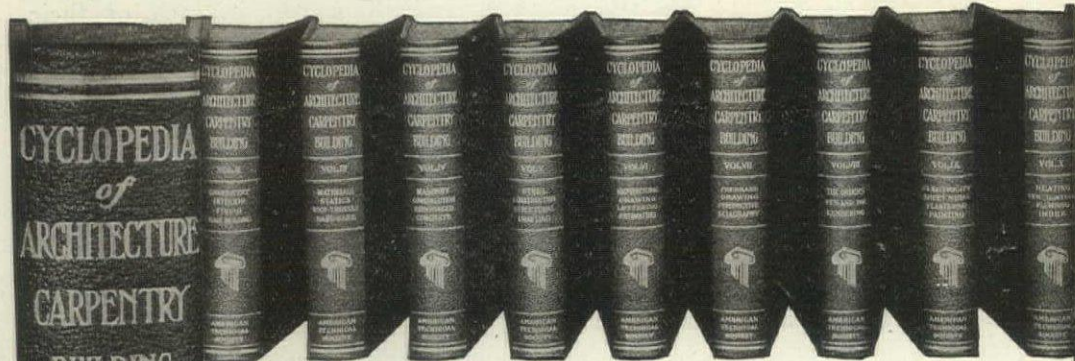
The reputation which they have built up on tanks, greenhouse lumber and work of a like nature from cypress is a very enviable one. They have proven that cypress is without doubt the very best

PASTE THIS DOME ON LETTERS YOU WRITE TO ADVERTISERS. IT HELPS.



Advertisers' Section.

224 page Plan Book and year's Consulting Service given FREE with this set!



This is one of the most attractive offers ever made. We give free to every purchaser of our newly revised **Cyclopedia of Architecture, Carpentry and Building**, a copy of "Modern American Homes," the most complete and up-to-date plan book procurable. It contains plans and specifications for 168 different structures, including excellent exterior and interior views, detailed estimates, etc. Designed by the leading architects of this country, it includes city, suburban and country homes, bungalows, summer cottages, tent houses and camps, also apartment houses, garages and various public buildings. Contains 224 pages, 9 1/2 x 12 3/4 inches, and 426 illustrations. Printed on heavily enameled paper and substantially bound. With this great plan book in your shop or office you are prepared to figure on any job, no matter how large. No need for the prospective builder to consult an architect when you can offer him his choice of practically every type of the modern American home. This saving of the usual architect's fee should get you the business.

In addition to this we give free with each set a year's consulting membership in the American Technical Society. Through this service you have the assistance of the most expert architects, structural engineers and draftsmen in America. They are no farther from you than the nearest mail box. They stand ready to solve your perplexing problems, to offer suggestions, to point out the things you should avoid. In fact they enable you to compete with the biggest and most experienced men in the construction field.

The Newly Revised Cyclopedia of Architecture, Carpentry and Building

This is the clearest, most practical and complete work ever published on the practice and possibilities of the modern building trades. It covers everything from cottage to skyscraper—from the plans to the completed structure. It includes wood, stone, steel and reinforced construction; estimating and contracting; a study of the Greek and Roman orders; interior finishing and decorating; and modern house lighting and sanitation. The work of forty experts, it can be depended upon to give you the information you desire on any and every subject.

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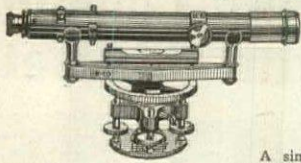
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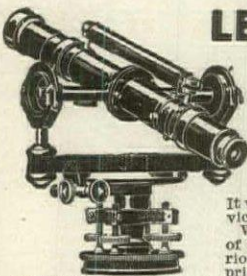
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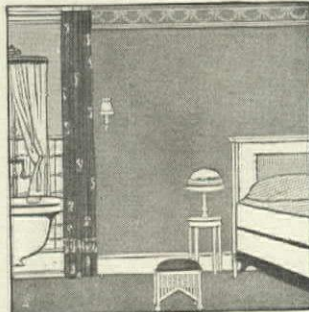
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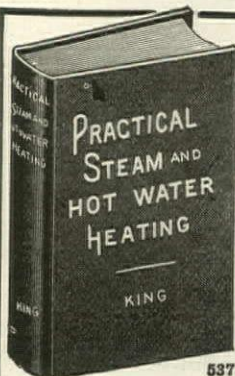
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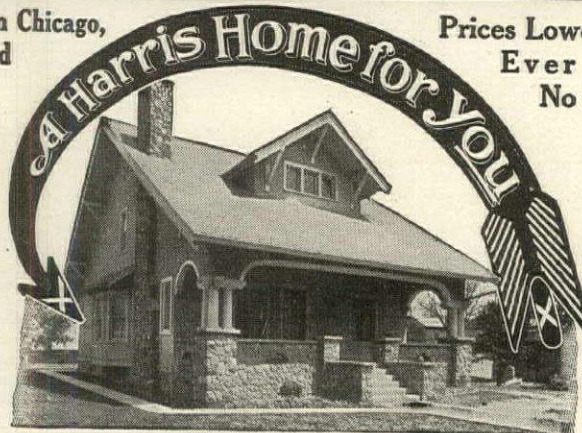
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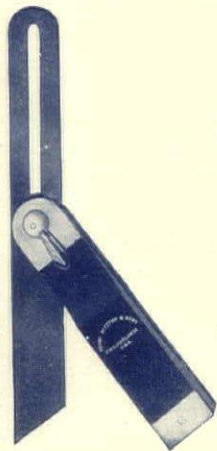
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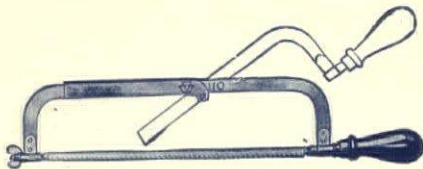
This saw has an adjustable cherry handle, curved and polished, which permits blade to be set in various positions. The blade itself is reversible and interchangeable. It is held firmly in place by patent bolt and ratchet.

Special attention is called to the reversible feature of the blade. In this way either the straight or curved edge of the blade, both of which are toothed, can be used to the best advantage.

Size 16, 18 and 20 inches.



DISSTON BRAND GOODS
QUALITY GUARANTEED



Hand Saw Jointer



Reg. U.S. Pat. Off.

HENRY DISSTON & SONS
INCORPORATED
Keystone Saw, Tool, Steel and File Works
PHILADELPHIA, U. S. A.

Established
1840

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ON LETTERS YOU
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You Read This Letter Last Month:—

"Your flooring has no equal. In matching and dryness it is far superior to any I have ever used. There has been **no shrinkage** in any of the flooring I have ever bought from you.

"I am building a \$6,000.00 house for one of my neighbors now and when he gave me the contract he said he wanted the same kind of flooring I had laid for him in his last home. That house was built in 1906 and when I looked at it the other day I noticed particularly that the 'Steel-Polished Perfection,' which had been down eight years, **showed no shrinkage whatever.**

"I have no fault to find with your flooring, in any way. It is perfect—and if any inquiries come to you request them to write me personally, with stamped envelope for reply, and I will gladly answer them."

J. Wm. Curtis, Champaign, Ill.

Now—Read These!

"'Steel - Polished Perfection' is absolutely the best flooring we have ever used—best milled, best graded and shrinks least. In fact, we have 'Steel-Polished Perfection' floors that have been down 8 and 10 years which are practically as good today as when laid."

Cohenour & Lentz,
Nevada, Mo.

"Your 'Steel-Polished Perfection' flooring is rightly named! The matching is perfect and as we always get thoroughly dry material, there is the absence of shrinkage, heretofore almost unknown. No need of using floor scrapers as it lays true and even."

Albert F. Grutschmacher,
Mukwonago, Wis.

"We've used 'Steel - Polished Perfection' hardwood flooring on a great number of jobs and are pleased to say that we have always found it satisfactory. We have used it exclusively for the past ten years."

Thos. Hay & Sons Co.,
Racine, Wis.

"'Steel - Polished Perfection' drives up very easily and requires very little scraping. In regard to shrinkage, it is superior to any I have ever handled." John P. From,
Port Richmond, N. Y.

"The 'Steel-Polished Perfection' hardwood flooring was excellent. It went together nicely and made a fine looking floor."

C. H. Vogue,
Mitchell, S. D.

WOULDN'T it be pretty good business for you to write us a letter or a post card right now—for samples—prices—and full information about "Steel-Polished Perfection?"

Hand Shaved Cypress Shingles

WE have on hand for prompt shipment genuine Hand Shaved Red Cypress Shingles—"the good old-fashioned kind." Longest wearing shingle made. Great for bungalow roofs. Write for sample and prices.

John Schroeder Lumber Co.
Foot of Pleasant Street Milwaukee, Wisconsin

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