

## DISSTON

## INSULATE SCREW DRIUER

This tool is designed expressly for Electricians' use.
The blade of crucible steel, hardened and tempered, is embedded in a handle of hard rubber of a texture that eliminates brittleness. It will not work loose.
The rubber handle is milled grip with projecting rings which prevent the hands from slipping down onto the blade. The hard rubber handle acts as insulation.
The Disston Insulate Screw Driver is something new. Most practical electricians' screw driver ever made.

Henry Disston \& Sons<br>INCORPORATED<br>Keystone Saw, Tool, Steel and File Works<br>Philadelphia, Pa.

## AUGER BIT ESSENTIALS

The Seventh Feature contributing to the high quality of

## RUSSELL JENNINGS BITS


is the care exercised in

## INSPECTION AND TESTING

After sharpening, the bits are carefully inspected, so that perfect bits only go on the market. They are then tested individually in all kinds of wood, the bit being motor driven. Electric measuring instruments indicate accurately the power necessary. In this way we know just what our bits will do before they leave our factory. The tests guide us in our constant effort to improve our bits.

> RUSSELL JENNINGS MFG. CO.
> CHESTER, CONN., U. S. A.

## WALL Bosabiobisitithinc

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

## FOR WALLS AND CEILINGS



This substitute for lath and plaster is made of kiln-dried, dressed lath, imbedded in hot Asphalt Mastic, surfaced with sized cardboard and cut at the factory into 4 x 4 ft . sheets, which are easily and quickly nailed to studding, ready for immediate application of wall paper, paint, burlap, or other decoration.

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

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

Shows Construction of Bishopric Wall Board.
Bishopric Wall Board Easily Applied
 PRICE WALL BOARD AND SHIPMENT - Crate of 16 sheets, coverinǵd 256 square feet of surface, $\mathbf{\$ 6 . 4 0}$ per crate, or $\mathbf{\$ 2 . 5 0}$ per 100 square feet, f. o. b. New Orleans, La., Cincinnati, or Alma, Mich. We ship from mearest point.

Cheaper Than Lumber.
Saves $75 \%$ on Labor.
Does away with Building Paper.

# SHEATHiNG 

Ideal Material for Cement Buildings or Stucco Exteriors. Proof against Dampness.

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

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

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


Shows Bishopric Sheathing over rafters read ${ }^{y}$ for Bishopric Rooflng. also Weather aards over Bistoopric Sheathing

Ideal home showing Weather-hoards over Bishopric Sheathing. lath side exposed. also Bishopric Roofing over Bishopruc Sheathing. (smooth side of sheathing exposed)


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

## GリNTT TVNT WALL BOARD

## A Fibrous Water-Proof Board Made in Convenient Widths and Lengths

To be Used Instead of Lath and Plaster in New Building or Repair Work


Malke your Garage Warm by Lining with UTLITYY Wall Board
Utility Wall Board is better than lath and plaster. It saves the user a lot of money besides giving him a handsome, durable job.
Utility W all Board can be painted and decoUtility Wall Board can be painted and decoBoard is being used in both small and large buildiags. Everyone likes it.

## Mr. Contractor

This is your chance to make more money and finish your jobs quicker. UTILITY WALL BOARD is right in quality and price. It has come to stay and is rapidly taking the place of lath and plaster.
Every up-to-date contractor and builder should get samples of UTILITY WALL BOARD at once. There are hundreds of places it can be used with a profit to you and satisfaction to the owner.
Remember that all delays of the plasterer are a thing of the past for those who use this modern building material.

THE HEPPES COMPANY, 4502 Fillmore Street, Chicago, III.


If every Architect, Contractor and Owner in the country knew of the REAL MERIT and ECONOMY of Wall Board and the decorative and artistic possibilities of this material when finished with

## Johnston's whasabie Dull Kote Paint

we assure you more Wall Board would be sold and a dozen factories could not supply the demand for Dull Kote Paint.

Write for free color folder and suggestions for Interior Decoration. It will show you why you should specify and buy JOHNSTON'S Dull Kote Paints.
The R. F. Johnston Paint Co.
Pearl and Main Streets
CINCINNATI, OHIO


PASTE THIS DOME ON LETTERS THAT YOU WRITE ADVERTISERS.
IT WILL HELP.


Try the manufacturer with your next order of Grille Work Colonnades, Consoles and Interior Columns. You may be agreeably surprised with prices and promptness in shipment. Why not send us your next order? We have thousands of well pleased customers; if you are not one of them, why not write today for our Catalog No. Nineteen and find out what we have to offer you in the way of interior decoration? Every dollar spent with us adds five to the value of your home.
$828=838$ Wells Street, Chicago, III.


## $\$ 25.85$

For this Elegant, Massive Selected Oak or Birch, Mahogany finished Mantel. "FROM FACTORY TO YOU"
Price includes our "Queen" Coal Grate with best quality enameled tile for facing and hearth. Gas Grate $\$ 2.50$ extra. Mantel is 82 inches high, 5 feet wide. Furrished with round or square columns, full length or double as shown in cut.
Dealers' price not less than $\$ 40.00$.
"REPUTATION AND QUALITY COUNT"

## CENTRAL MANTELS

are distinctive in workmanship, finish and style. Twenty years' experience enables us to know and satisfy the needs of those who want Mantels of quality, different from the rest. We build all styles, Colonial to Mission.

CATALOGUE FREE. Will send our 112 -page Catalogue, the finest ever issued, free, to carpenters, builders and those building a home.

CENTRAL MANTEL COMPANY
1237 Olive Street, St. Louis, Mo.

Write for Our New Catalog-Mailed Free


WINDOWS- 42 c and up


D00Rs-80c and up


WINDOW BEAD-Best Yellow Pine, 27 c per 100 lin . ft .


INVESTIGATE
before you buy
and you will find we can save you lots of money on anything in the line of HIGH GRADE sash, doors, frames, blinds, mouldings, inside trim, grilles, colonnades, stair and porch work, mantels, grates, tiling, art glass, paints, roofing and building papers, wall boards, hardware, hardwood and parquetry flooring, rolling partitions, screens, steel ceilings, gutters, shingles, etc.
Our New Catalog Mailed Free Will Convince

The Huber Builders Material Co. 39-43 Vine St. CINCINNATI, 0 .




WRITE TODAY
for Vol. 9 of the CYPRESS Pocket Library telling
about Cypress siding-and why.


CYPRESS - "the only GREENHOUSE Wood"- or for Pergolas, Trellises, etc. Ask greenhouse men. Get Vol. 3.


VOL. 31 is an eye-opener on Cypress for INTERIORS. Superb grain. Easy to work. No pitch. The book proves.


VOL. 7 (Cypress Pocket Library) is "the most valuable SHINGLE book ever printed. Yours by mail on request.


FARM and Country Home Improvements of Cypress never "run down." Vol. 22 covers Tanks and Silos also. Get it.


EVERY FOOT of every Porch, Sleeping Balcony or Fence should be CYPRESS. Vol. 16 covers it. Write today.


Working Plans Free
Write for Vol. 18
When planning a Mansion, a Bungalow, a Farm, a Sleeping-Porch or just a Fence, remember-
"WITH CYPRESS
"et our "ALL ROUND HETPS DEPAPTMENT" Let our "ALL-ROUND HELPS DEPARTMENT" help YOU. Our entire resources are at your service with Reliable Counsel SOUTHERN CYPRESS MANUFACTURERS 1212 HIBERNIA BANK BUILDING, NEW ORLEANS, LA.
INSIST ON CYPRESSAT YOUR LOCAL DEALER'S. IF HE HASN'TIT, LET US KNOW IMMEDIATELY
"CYPRESS-AND NO SUBSTITUTES"
$\leftrightarrow$


Working Plans Free Write for Vol. 6



A RED GUM BANK AND OFFICE BLDG., THE LINCOLN BANK BLDG., LOUISVILLE, KY
"RED GUM is the logical wood" for a superior result in Interior Trim in costly buildings in which money is not intended to be wasted AS WELL AS IN MODEST HOMES. The interior trim of the fine building shown at left is RED GUM and the result is a structure notable for its beautiful and thoroughly satisfactory woodwork.


## Another Valuable Lead for WideAwake Builders

SAP GUM is of course a part of the same tree from which RED GUM comes. As the tree grows the sap changes to red, and SAP GUM has most of the excellent qualities of RED GUM.

SAP GUM, which was formerly used for the manufacture of boxes, in grades that were suitable for much better purposes, is now recognized as a wood which is much too valuable for such purposes, and is being rapidly diverted into its legitimate channels.

SAP GUM is excellent for interior work, as it takes stains and varnish beautifully and there is no exaggeration in the statement that it is the best wood obtainable for

## White Enamel Interior Trim for Colonial Houses

S.AP GUM finishes with absolute smoothness - a rare virtue.
SAP GUM takes glue as well as any wood manufactured.
SAP GUM at present price is a remarkable investment.
Builders desiring to see samples of Red and Sap Gum, both rough and finished, or who want prompt quotations on selected Red and Sap Gum, should write at once to any or all of the following firms:
LAMB-FISH LUMBER COMPANY
Charleston, Mississippi HIMMELBERGER-HARRISON LUMBER COMPANY, Cape Girardeau, Missouri CARRIER LUMBER \& MFG. COMPANY
BAKER LUMBER CO. Sardis, Mississippi

ANDERSON-TULLY CO.
THREE STATES LUMBER COMPANY CHARLES F. LUEHRMANN HARDWOOD LUMBER CO., St. Louis, Missouri AT ITS PRESENT PRICE GUM IS THE MOST REMARKABLE PURCHASE IN THE ENTIRE HARDWOOD FIELD.

# We Want A Builder In Every Town 

We Have an Attractive Proposition for One Carpenter or Builder in Every Community to Take Orders for Our Widely Advertised

## EDWARDS' METAL SPANISH TILE

ARE EASILY SOLD BY OUR AGENTS
Home Owners Everywhere Are Reading Our Advertisements in the Leading Magazines

## EDWARDS' INTERLOCKING METAL SPANISH TILE architects everywhere specify this attractive roofing

Edwards' Metal Spanish Tile are stamped out of the highest quality Worcester Grade Terne Plate, size $10 \times 14$ inches, furnished either painted or heavily galvanized. They are provided with our patented interlocking device, which conceals all nails, makes it possible to get a perfectly moisture proof roof without soldering and without danger of having the tile crack open in extreme cold or hot weather.
Edwards' Metal Spanish Tile looks exactly like the best Terra Cotta Tile. They have the decided advantage of being much lighter, easier to apply, longer lived and cost much less.

Write us today about your territory. Here's an opportunity you should not miss. Many carpenters and builders have been so successful taking orders and laying our Metal Spanish Tile that they now devote their entire time to this business. Others have made big profits selling and laying our metal tile roofing "between jobs." We show you how to build up an independent, profitable business in your own community. Write for our proposition today. The territory is going fast. Don't be too late. Send a postal right now.

## The Edwards Manufacturing Company

## Carborundum Carpenters' Round Combination Bench Stone

You can Use All of the Surface and Put a Clean Smooth Edge on Your Chisels, Plane Bits or Similar Tools-

Note the shape-round so as to give full play for rotary sharpening motion-There is no unused surface-The wear is uniform-Its use means a better edge in less time-Can be used dry or with Carborundum Temperoil, the oil that tempers the cut, smooths the edge, does not gum and has no acid.

Carborundum Round Combination Bench Stone


All from your dealer or by mail direct.

## The Carborundum Company

Niagara Falls, N. Y.



Order the Scientifically Prepared-

## BAYONNE ROOFAND DECK CLOTH

Easiest to lay-Lasts longest. Requires but one coat of palnt. The treatment permeates the fabric and preserves the fibre
BEST FOR PIAZZA ROOFS AND PORCH FLOORS Ask for Sample Book B-6 and Prices
John Boyle \& Co., 120.1212 peanae street Street New York 202 and 204 Market Street, ST. LOUIS

The Standard Brand of White Canvas All Widths-All Weights-Any Quality


Our co-operative department gives complete instruction for laying BAYONNE OR GULF STREAM JOHN BOYLE \& CO.'S Awning Stripes have been the Standard for 50 years.

Time-and-weather test is the real roofing test.

You want to be sure before you buy that your roofing will stand this vital test. The only way you can be sure is to know what the roofing is made of.

## Genasco

## the Trinidad-Lake-Asphalt Roofing

is free from mystery and deception. It has the life that only natural asphalt can give roofing to make it thoroughly and permanently waterproof.

The natural oils in Trinidad Lake Asphalt give it this resisting life; and they do not dry out of Genasco like the volatile oils in artificial asphalt roofings, which leave them to crack, crumble, and leak. Genasco resists rain, snow, sun, wind, heat, and cold-and it lasts.

The Kant-leak Kleet not only makes seams absolutely water-tight without cement-it prevents nail-leaks, and gives the roof an attractive finish.

Ask your dealer for Genasco mineral or smooth surface roofings with Kant-leak Kleets packed in the roll. Fully guaranteed. Write us for samples and the Good Roof Guide Book.


THE BARBER ASPHALT
PAVING COMPANY
Largegt produeer of asphalt, and largeat
manuufacturen of ready roofng in the word. PHILADELPHIA San Francisco

Chicago
New York


## Viulcan

 iteHere's a roofing that has passed every test that proves good roofing-that has been made and sold on merit for sixty years.

Think of the experience behind it. Consider the number of highest awards it has received at expositions. Study the points that make it so good,

Made from the highest priced mineral compound known and the purest felt obtainable, in our own mills where we can watch the manufacture from start to finish. We use no paper or cheap filler-just the pick of materials that make roofing durable.

VULCANITE roofing will not freeze or crack-climatic conditions have no effect whatever. It's the most extensively used roofing in the world today becausethere are reasons.

## VULCANITE CRYSTAL SPAR SIDING

A new building material that has made good for use on Bungalows, Summer Cottages, Residences, etc. Fire and water-proof. Easy to apply, never cracks and saves painting and building paper. Used with clap-boards, this siding makes a substantial and well appearing building, besides effecting an all-around makes a substantial and well appearing building, besides enfecting an

## Send For Samples

To enable the carpenter, builder and contractor to be his own judge and jury of VULCANITE Roofing and VULCANITE Crystal Spar Siding we will send liberal samples free upon request. We merely ask you to examine it-to test them in competition with other brands-and to read our literature. Send today.
Patent Vulcanite Roofing Co., 1240 S. Campbel Ave, Cilicaco



The "Buffialo"

## Crain Combination Woodworker

Has Lathe $40^{\prime \prime}$ between centers; Band Saw taking $12^{\prime \prime}$ under the guide; Saw Mandrel taking saws up to $12^{\prime \prime}$ diameter; Planer Head, $5^{\prime \prime}$ or $10^{\prime \prime}$ drill, boring machine, sizer, shaper, tenoner. Three men can work at it at one time and perform a Dozen Different Operations. It is the latest invention and without comparison the simplest, strongest and most efficient machine made at the price. Low power cost; only $4 \mathrm{H} . \mathrm{P}$. required at full load. No extra attachments needed. The facilities for adjusting every working part to suit the work in hand are unequalled.
Send for Complete Description and Prices. Booklet 1785.

$\$ 165.00$
For this Portable Saw Rig Complete 9 Machines in One.


Will rip $2^{\prime \prime}$ and cross cut $3^{\prime \prime}$ lumber. Write for descriptive folder.

## C.H.\&E. Manufacturing Co.,Inc. 319 Mineral St. <br> Milwaukee, Wis.



# THE GRIMM WOODWORKER IS A WONDER WORKER 

A Practical, Portable Planing Mill that Will Save You Time, Labor and Money


## CUSTOMERS WRITE OUR ADS

720 Clinton Ave. North, Rochester, N. Y., Dec. 10, 1910. Grimm Mfg. Co.:

Gentlemen-The Combination Woodworker which you sold me a short time ago, I am very much pleased with. It is the best wood-working machine of its kind I ever saw. If I knew I could not get another machine like it, I would not sell it for triple its value. Wishing you all success, I remain, yours truly,
(Signed) GEORGE WEGMAN.

## The Grimm Woodworker

Saves you Money. Puts the profits of the planing mill in your pocket and its saving of time and labor means money to you.

## The Grimm Woodworker

Will do all the mill work needed in the construction of any building.

## Nine Machines in One

Rip Saw Cross Cut Saw Dado Head Jointer Sander Moulding Knives
Emery Wheels Jig Saw Boring Attachment

Send for Booklet and Trial offer ${ }^{\text {GRIMM MFG. CO., }} 42$ Erie Street, Buffalo, N. Y.

## EOY UNIVERSAL WOOD TRIMMERS <br> 



BUYS THIS TRIMMER COMPLETE with triangular gauge blocks which make it possible to do a large amount of special work on this machine.

## न्बः Machine Co.

26 North Front St., Grand Rapids, Mich.

HUTHER BROS. PATENT GROOVER OR DADO HEAD WILL SAVE COST IN THREE dAYS USE


## PARKS' WOODWORKER <br> The FIRST and ORIGINAL COMBINATION of Circular Saw, Jointer and Band Saw, ever placed on the market. <br> Reversible Spindle Shaper, Boring and a dozen other valuable attachments can be added. <br> Each machine is sold separate or can take a circular saw and add to it all desired. <br> The long base best arranged for Portable Use with engine attached. BUY from the ORIGINATORS and LEADERS in improvements and you will be sure to get the best Our Ball Bearing Machines are the greatest improvement ever made in Foot and Hand Power Circular and Band Saws. and Hand Power Circular and B Write for Catalog and Prices.

PARKS' BALL BEARING MACHINE COMPANY



## TAYLOR PORTABLE STEEL DERRICK

For Builders, Roofers, Plasterers, Stone Masons, and with special equipment for unloading railroad gondola cars. Constructed entirely of malleable and steel, roller bearing, circle swing, Hoists clear side wall and lands on eighteen-inch trucks. Adjustable capacity and speed.

One man operates both cranks and can hoist 1500 pounds Price $\$ 40.00$

JOHN L. TAYLOR<br>1034 W. Lake Street,<br>CHICAGO, ILL.



5 H. P. \$119.50

13/4-28
H. P.

Built
for Service

## CONTRACTORS AND BUILDERS <br> 

Galloway Engines are made in all sizes from 1144 to 28 H. P. They run on gasoline, naphtha, kerosene or distillate. We are furniahing complete mixing rigs and our price means a big asving of money to you $-\$ 50$ to $\$ 300$, depending on the engine you buy. You have the privilege of trying of money to you-s 80 to $\$ 300$, depending on the engine you buy. You have the priviege of trying
the outfit 30 dayg. If it is in any way unsatisfactory we refund your money with interest and pay the outfit 30 days.

## The Galloway Gasoline Engine

 SIMPLEST ENGINE BUILTOnly four things to do:
Turn on the switch, turn on the oil, turn on the gasoline, give the flywheel a start and the Galloway will go right along all day without further attention. It is ideal power for a small shop, and it's got the capacity to take care of your growing needs for operating planers-matchers, athes, saws and concrete mixers.

The Galloway has been classed as a standard, high grade engine for fifteen years. Over 4,000 n use in Iowa alone. Thousands in every other State and Territory.

If you try the Galloway engine, you will find that it is not overspeeded. Remember, the bore and stroke count, and you don't have to drive your engine faster than you ought to drive it to get the rated horse power. Rated by actual brake test,

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

The price given is for the five-horse power only, but we make these engines in seven sizee
Ask for free information on stationary and portable gasoline engines from two to twenty-eight horse power. We make the best, and we price them at a reasonable figure. Write today.
The William Galloway Company, waties coloo,


TRADE SCHOOL SERIES


Sent postpaid on receipt of price
HODGSON BOOK CO

THE RED BOOK SERIES OF TRADE SCHOOL MANUALS, by F. Maire, Director of the Chicago School of Painting, Decorating and Paperhanging 6 volumes, 16 mo , Full Cloth. Each Illustrated. Price The author being acquainted with many of the European and nearIy all of the American Manual Training Schools, where painting is taught, feeling the need of a treatise which would help the student or instructors in imparting knowledge, has prepared the
(1) Exterior
(2) Exterior Painting, Wood, Iron and Brick
(3) Colors, What They Are and What to expect
(4) Graining and Marbling.
(5) Carriage Painting.

The arrangement of the above volumes is such that the student is gradually advanced upon the branches treated and the questions at the end of each lesson will become an index of reference which
he will find useful Instructors will surely welcome these valuable he will find useful. Instructors will surely welcome these valuable
manuals, as they will save them numberless repetitions. The student who cannot leave home to attend a school will find his task of learning the various branches treated greatly facilitated
by procuring these volumes.

358 Dearborn Street, CHICACO

2. For Ripping. Solld Iron Table Planed $\begin{gathered}\text { Porfootly True. }\end{gathered}$ COUNTERSHAFT IF DESIRED.
Send for Our New Catalogue
Our new foot and hand power Circular Saw No.4, the strongest, most powerful and in every way the best machine of its kind. For ripping, cross-cutting, boring grooving,dadoing etc

## Carpenters! Builders!

 III. With Universal Mitre Gauge.

Foot and Hand Power Machinery, Lathes, Scroll Saws, Formers, Mortisers, Tenoners, etc.

II. For Cross Cutting.
W. F. $\mathrm{E}_{\mathrm{E}}$ JOHN BARNES CO. 436 Ruby Streut, ROCKEORD, It,

# "It runs like a sewing machine and does the work periectly" 

Said MR. PINNICK, of Richmond, Indiana
The Sidney Tool Co, Sidney, Ohichmond, Ind., March 1, 1911. Gentlemen-Inclosed find check in full for my account, less three dollars for expenses which you ordered me to deduct. This
machine is as represented, if not better. To say that I am machine is as represented, if not better ilke a sewing machine and does the work perfectly. Yours truly,
HARRY PINNICK, 112 S . 10th St.
Sixteen woodworking machines, embodied on one base, comprise the No. 14 FAMOUS Universal Woodworker This machine has a record-over six hundred in use and never one "kick." The
FAMOUS is the only perfected Universal Woodworker; the money you pay for others is paid for experiments. Competitors can imitate only our advertisements. They cannot duplicate-or even imitate-our machine or the work it does. could be performed; it is the only woodworker which can be relied upon to give first-
class service. Play safe. Don't experiment. Buy a FAMOUS when you buy a woodclass service. Play safe. Don't experiment. Buy a FAMOUS when you buy a wood-
worker. We give a broad-gauged guarantee that protects the buyer as long as he may worker. We give a broad-gauged guarantee that protects the buyer as
have the machine-and which protects any person who may buy it from him.
Write for literature and liberal terms.


Above illustration shows a No. 14 FAMOUS Universal Woodworker in actual
operation. It does sixteen different kinds of work.
$127^{\prime \prime}$ Band Saw,
2 12" Jointer
3 Saw Table, with raising and lowering arbor
4 Single Spindle Shaper
5 Boring Attachment, arranged on special boring spindle.

6 Pony Planer
Z Tongue and Pole Rounder
8 Hollow Chisel Mortiser
9 Single End Tenoner
10 Drum Sander
11 Disc Sander

12 Knile Grinder
13 Emery Girinder
14 Band Re-Saw
15 Spoke Tenoner, Rim Borer and Wheel E'qualizer
16 . Adjustable Felloe Rounder

## Whatever your customers may demand in

Enamel, Varnish, Stains, Floor Paints and Ready Mixed Paints

## "Alcolac" Will Supply

"ALCOLAC" ENAMEL-elastic, hard and smooth-insures a sanitary, porcelain-like finish on wood, iron, stone, tin and other materials.
"ALCOLAC" VARNISH STAINS for finising and refinishing woodwork and furniture are unequalled. Cover scratches and mars. Produce beautiful finish washable with soap and hot or cold water.
"ALCOLAC" FLOOR PAINT protects as well as covers. Dries hard and resists moisture. A most inexperienced person can apply it.
"ALCOLAC" READY MIXED PAINTS are made of pure chemicals thruout-Linseed oil, Japan driers, lead carbonate, zinc oxide and pure tinting colors. Finishes with a hard glossy surface proof against gases, sea fogs, salt air and atmospheric changes-the enemies of all ordinary paints.

Our discounts are liberal-your profits good.
Write for our Contract Proposition. Beautiful Celluloid Signs with every order Handsome Sterling Silver Mounted Fountain Pen with every $\$ 25.00$ order

## Alcolac Mfg. Co., :: Long Island City, N. Y.

# THE NATIONAL BUILDER 

FRED. T. HODGSON, Editor
Charles A. A. Miller, Jr.
Wm. C.
A. St Stevenson Associate Editors
Porter-Hodgson Co., Publishers, 542-550 South Dearborn St., Chicago

FRED. A. HODGSON, President SUBSCRIPTION RATES:
Demestic, $\$ 2.00$ per year; Foreign, $\$ 2.50$ per year,
New York Office, 203 Broadway.
Published on the Fifteenth of each Month.

FRED. D. PORTER, Secretary and Treasurer
Entered as Second-Class, Matter April 3, 1896, at the Postoffice, Chicago, Illinois. Act of March 3, 1879.

Chicago Trade Press Association.
Established 1885.


GEO. A. FARGHER, V. Pres. and Adv. Mgr. RELIABLE ADVERTISERS
The Natiomal Builder seeks the advertising of rellable houses only, and asks that prompt notice be given by any reader who has cause for complaint against an advertiser, that the matter may be investigated, and the advertisement disconti
be proved untrustworthy.

Volume 52

## CHICAGO, MAY, 1911

## CONTENTS OF READING PAGES.



PAGE

Planning a Private Garage
Builders' Course in Architectural Drawing
An Extra Hazardous Risk
The One Story House.
The Builder and the Auto
Fighting the House Fly
Hotel McAlpin
Setting Out a Curve.
Our Readers' Pages
Notes on Construction
New Books Received
Legal Decisions
Patents
$\qquad$

## INDEX TO ADVERTISEMENTS



Gordon, Van Tine \& Co Grand Rapids Foundry Co. Grand Rapids Hardware Co.
Grimm Mfg. Co................
 Hartman-Sanders Co. Hartm
Hess
Heppes
Hildreth Mifg. Co.
Himmelberger-Harrison Lbr. Co
Holland Furnace Co
Hoosier Mfg. Co.....
Huber Builders Material Co
Huther Bros. Saw Mfg. Co
Ideal Concrete Machinery Co.
Ideal Mfg. Co..........................
International Harvester Co.
Iszard Warren Co.
Iwan Bros. ......


K
$\underset{\text { Karolh, }}{\text { Kith, }}$ M. Y L
Keasbey \& Martison Co.
Kepplinger,
Kees F
Kees, F. D., Mfg. Co
Keuffel $\&$ Esser Co
Kimball Bros. Co...
Lansing Wheelbarrow Co.
Learner, P. H., C
Lippy,
Lutkin Rule C .
Lamb- Fish
Luehrmann Hardwood Lumber Co., Charles
Luther Mfg. Co...............................


Mastic Wall Board \& Rfg
Menz, R. J., Lumber Co.
Menz, R. Mg. Lumber Co
Milbradt M. Co........
Miller, A. W., Mfg. Co
Millers Falls Co................
Milwaukee Corrugating Co.
Milwaukee Corrugat...
Miotke, Jos.
Mooreman \& Otten...
Mullins, W. H., Co.


Oehrle, E.
Ornamental Products Co.
Orr \& Lockett Hardware Co.

| P |
| :---: |
| Parks Ball Bearing Machine |
| Patent Vulcanite Rfg. Co.. |
| Pearson M Mfg. Co |
| Phillips, A. J., Co |
| Phoenix Sliding Blind Co |
| Pike Mfg. Co. |
| Pullman Mfg. Co. |




Taylor, Jas. L., Mfg. Co.
Taylor,
Three States Lumber Co
Tiffin Art Metal Co
Topp, G. A., \& Co...........
Transcontinental Freight Co.
Triple A Machine Co...
Trussed Concrete Steel
Union Fiber Co.

Van Dorn Iron Works Co
Voltz Mfg. Co.........
Von Gerichten Art Glass Co.

$$
\ldots
$$

Waddell Mfg.

$$
\begin{aligned}
& \text { Waddell Mfg. Co............ } \\
& \text { Wadsworth Howland Co.... } \\
& \text { Waterloo Cement Mchy. Corp } \\
& \text { Watrous Mfg. Co., E. L....... }
\end{aligned}
$$

$$
\begin{aligned}
& \text { Watrous Mfg. Co, E. L.. } \\
& \text { Weber Manufacturing Co. } \\
& \text { Weber \& Co.............. }
\end{aligned}
$$

Whipple \& Co.

$$
\begin{aligned}
& \text { White Co, David. } \\
& \text { Willis Mfg. Co.. }
\end{aligned}
$$

$$
\begin{aligned}
& \text { White Co., David................ } \\
& \text { Willis Mfg. Co.......... } \\
& \text { Winthrop Asphalt Shingle Co. }
\end{aligned}
$$

$$
\begin{aligned}
& \text { Wint Mrg. Asphait Shingle Co. } \\
& \text { Winter Mf. Co. ............ }
\end{aligned}
$$

$$
\begin{aligned}
& \text { Winter Mfg. Co... } \\
& \text { Wood \& Sons Co. } \\
& \text { Woodwell Co., Jas. }
\end{aligned}
$$



Bommer Spring Hinges are Quality Goods


Reputations are made by consistently giving your customer the best spring hinges and avoiding imitations or substitutes

Sommer Spring Hinges are sold by all Hardware Dealers



## TRUS-CON JOIST HANGERS

Avoid cutting away and weakening of timbers and walls-save labor, time and money.

Trus-Con Joist Hangers are made from open hearth steel plates, and are proven by actual test to be the strongest on the market. Note the bulb-shaped reinforcement at upper angle.
We also furnish Post Caps, Post Bases, Wall Plates and Base Plates made in rolled steel, malleable iron, or cast iron.

Write for catalog and prices.

Made in all
sizes and styles for use with brick or concrete block walls or with wooden or steel en or

## SHAFT HANGER SUPPORTS for CONCRETE BUILDINGS

## Trus-Con Slotted Inserts are imbedded in the

 concrete during construction and furnish a simple, adjustable attachment for shaft hangers, sprinkler systems,etc. -

Supplied in various sizes in either rolled steel or cast iron; also Trus-Con Socket Inserts to receive threaded bolts.

TRUSSED CONCRETE STEEL CO., 384 Trussed Concrete Bldg., DETROIT, MICH.

## All Gears Guarded <br> WHEEL-Best known abras- <br> CARPENTERS

ives, $5^{\prime \prime} \mathrm{x} 1^{\prime \prime}$

Can be clamped on table or bench -Weight 11 lbs .

Rest aldjustable to any angle. Positively will not draw temper of any edge.

Every workman needs sharp tools for good work. You can have yours sharp at all times by owning an "Atlanta Grinder, an accurate, workmanlike, high-grade machine.
It costs only 87.50 -is always handy to sharpen and grind out a nick when you need a tool the most.
It pays for itself in a short time. Any carpentry or building contractor can save its cost many times over lin time saved in grindtools and in faster and better work due to tools being kept in perfect condition.

A HAND POWER GRINDER THAT MEETS THE MOST EXACTING REQUIREMENTS
At your dealer's-If not, the manufacturers will send by express prepaid on receipt of price. The A. A. Wood \& Sons Core, $\quad \therefore$ Atlanta, Ga.


Made in three sizes: $8 \times 18,8 \times 15$, and $8 \times 12 \mathrm{in}$. Roller Edge Roller easily adjusted to either side

Perfect Results are Easily Obtained by Using Schlueter Rapid Floor Surfacer
This machine is built on the only correct principle. It is guaranteed to be The Best machine with which to produce an even, smooth service on
any kind of large or small wood floor, old or new, hard or soft, and in all buildings: Residences, Stores, Factories, Bowling Alleys, Roller Skating Rinks, Reception and Dance Halls, Etc.
The Schlueter will remove all joints or warped edges, and oil, wax, lime stains, or the "muck" from skate wheels, in a most satisfactory manner. Earning Capacity, $\$ 20.00$ to $\$ 35.00$ per Day Send for prices and Free Trial Proposition
M. L. SCHLUETER

101 N. Canal St., CHICAG0, ILL.
1001 Flatiron Bldg. NEW YORK.
Acme Floor Surfacing, Laying \& Finishing Co. Not Inc.


## Looking for a Modern Saw Bench?

The above cut represents our new Combination Saw and Dado Machine.
The Frame is quite substantial, with closed front.
The Ways adjust for depth of cut, and
The Carriage moves on rollers having ball-bearings.
The Saw Mandrel runs in self-oiling boxes, and is brought into the work by a foot treadle, thus leaving both hands free to handle the work.
For further particulars concerning above and other machines, address
> H. B. Smith Machine Coo., Smithville, N. J., U.S.S.A. New York

> Chicago
> Atlanta
> Shreveport

## "IT'S A SCRAPER BUT IT WORKS LIKE A PLANE"

That is what the many satisfied Contractors and Builders who are using The Boss Improved Floor Scraper say.
THE BOSS has double swivel allowing the knife to be sat in any position. Gauge can be set for any thickness of shaving and keeps knife from making depressions in floor. Gives knife double support. pear-shaped wheel which is in the gauge is attached to the gauge in front so that when the scraper is let down to take shaving, it lets the knife down gradually and prevents the knife from making a deep cut. With this gauge and wheel attachment the knife will leave no mark. Impossible to do poor work. Adjustment simple-positive. Gauge can be rewheels and takes off the rosin when working hard pine. Prices very low. Write for descriptive circular " N " GEORGE J. KEPPLINGER, - Dwight, Illinois


## MARSTON'S

Iron frame, 36 inches high. Center part of top is made of iron accurately planed with grooves on each side of saw gauges to slide with grooves on each side of saw for gaugen to slide in. Steel shafts and best babbitt metal boxes. Gears are all machine cut from solid fron. Boring table Gears are all machine cut from solid fron. Boring table with each machine. Weight, complete, 350 pounds.
J. M. MARSTON \& EO.g BOSTON,

[^0]
## "DIAMOND" MORTISER

For Foot Power

Will mortise $\mathrm{I} / 8$ to 1 inch wide, 3 inches deep or 6 inches deep by reversing the work, and with our patent adiustable tenoning tool will cut tenons $1 / 8$ to 1 inch wide. Has rigid iron column, powerful foot motion and accurate action. The table has horizontal, vertical and angle adjustments.
It takes up but little space, is light and can be easily moved about to accommodate your work.
We make a complete line of Foot, Hand and Light Power Wood-working Machinery suitable for Carpenters, Builders, Cabinet Workers and other Wood-workers. It will pay you to investigate their merits.

Send for catalog "A."

# The Seneca Falls Manufacturing Co. 

629 Water Street
Seneca Falls, N. Y., U. S. A.


## ROTECT YOUR FINGERS

## by using a CRESCENT Jointer with Safety Head

The knives in CRESCENT Safety Heads are made of high speed steel which will hold an edge longer and turn out better finished and more work than can be done on a common jointer with ordinary knives. You may crowd the machine to the limit and the quality of work will be just the same as though you hadn't crowded it a bit.


The price of these splendid machines is very reasonable considering the very high quality of the machines and the enormous amount of accurate work they are capable of turning out.

Send for catalog giving complete description. It tells about our elegant line of Band Saws, Saw Tables, Jointers, Borers, Shapers, Planers, Planer and Matchers, Pole Rounders, Disk Grinders, Variety Woodworkers.



## When You Buy a Floor Surfacing Machine BUY A GOOD ONE=IT PAYS!

The Triple "A" Spring-Driven Floor Smoother combines the advantages of the hand machine and the power machine. No more expense than the former, yet has the capacity and ease of operation of the latter.

No wasted energy pulling a dead weight.
About half of all the Triple "A"s sold have been bought by owners of dead weight machines. What's the answer?
"Get the best first and save extra expense."


The Triple " $A$ " to be appreciated needs only to be seen in operation.

For advertising purposes we will give a special discount on the first machine sold in each town.

## SENT ON FREE TRIAL

WRITE FOR FULL INFORMATION

[^1]
## TRY THEM ALL- KEEP THE BFST

Weber Tools and Appliances
Stand for Themselves-
Try the WEBER ${ }_{\text {Doable }}^{\text {Dating }}$ Floor Scraper
on the same floor with all others on the mar-
ket. If it is not handier, more ime and lator saving and more all thru-return it at our expense.


Cabinet Scraper and sander - a tool which every cabinet maker, carpenter and painter should have. It is recognized as the most valuable article of its kind ever invented. Ask you dealer. If he does not handle it, I will ship direct or thru him.

## Double-Folding

Scaffold Bracket
Is adjustable to any building. Can't swing. Where it ordinarily requires three rows of scaffolding, with the WEBER it requires only two; 12 of these brackats when folded take up space only $3^{\prime} \times 4^{\prime} \times 6^{\prime}$.


## Folding <br> Saw-Filing Vise

Also ask your dealer to show you the
WEBER Folding Saw-Filing Vise-the
Saw Vise you want. Has a rigid grip and is
almost noiseless. You will find it the most
convenient tool you ever had on a job, or in
your shop. It akes
up no more room in
your hand box than
an ordinary hammer. Vise Open for Us 2

Wax Polishing Brush
and sander. Brush sits square and even and imparts a high gloss. Sand-papering block admits tarning paper onc-half around, greatly lengthening its life.


## Write for Free Trial

I want you to try the Weber Double Acting Floor Scraper on my 5 to 10 days free trial offer.

## JOHN F. WEBER, President

Weber Manufacturing Company
661 71st Ave., West Allis, Wis.

## WHAT IS THE ANSWER?



When nearly every mail brings letters such as are reproduced below-what does it signify? Isn't it almost positive proof that the Acme Floor Scraping Outfit does the work? Read these letters-they are simple expressions from contractors who have accepted my free trial offer. They aren't old and shopworn letters either. Look at their dates.

Jos. Miotke,
Carrollton, Ill., March 18, 1911.
Dear Sir:-Enclosed find draft in payment for the floor scraping outfit you sent me on trial. I anyone looking fines and found that they do the work perfectly. I am well pleased with them and if I see anyone looking for a floor scraping outfit I will certainly recommend yours.
Yours very respectfully,

Yours very respectfully,
James C. Sackett.
Williamsport, Ind., March 21, 1911.
Joseph Miotke, Milwaukee, Wis.
Dear Sir:-I set the floor scraper to work last Saturday and must say that it is satisfactory in every particular. Inclosed you will please find my check for same. Respectfully, B. F. Bush.

Eveleth, Minn., March 29, 1911.
Joseph Miotke, Milwaukee, Wis. craping outfit sent 2nd. I gave it a hard tial on both old and new floors and concluded that it was just the outfit that need for my work.
nerd tial on both old and new floors and concluded that it was just the outfit that
Respectfully, Respectfully,

Chas. H. Rutty.
Don't you think it advisable for you to give my outfit a trial? It don't cost you anything to try and if the machines are not satisfactory just send them back after you have used them for one week and I will pay the charges.

Let me send you full details of this offer. It means money to you, so write today.

## JOSEPH MIOTKE, 249 Lake Street, MILWAUKEE, WIS.

## NICHOLLS

 NEW TAKE-DOWN SQUAREGuaranteed Accurate and Will Remain So
The main feature of our new Take-Down Square is that it will always stay true; it is so constructed that the tongue is held down into beveled bearings by a spring, and these bearings are made so as to take up the constant wear which comes in taking square apart and putting it together, thereby producing constant accuracy.

## SOME OF ITS GOOD POINTS:

1. Convenient to carry.
2. Each time Square is taken apart and put together the wear produces a firmer joint, thereby insuring constant accuracy.
3. The only Take-Down Square which leaves no part of the Tongue attached to body, when separated,
4. Occupies smaller space than any other Take-Down Square manuactured. $2^{\prime \prime} \times 24^{\prime \prime}$.
5. Instantly taken apart and put together.
Manufactured in Nos. 3 and 100 Standard; also No. 100 Rafter Framing, giving lengths of common, hip, valley, and jack rafters for 17 different pitches of roof.
ALSO THEIR CUTS
If your dealer will not supply you we will gladly ship you one of these express prepaid upon receipt of price.

NICHOLLS MANUFACTURING CO., Ottumwa, Iowa


The Novo Engine

The NOVO gasoline engine in four sizes from $11 / 4$ to 6 H.P. is especially adapted for use on portable and stationary machinery of every kind. It is very light in weight, absolutely self-contained, gasoline being in the base and the water contained in tank around the cylinder, which is guaranteed not to burst from freezing.
 The upright form and low height for vertical engine, and small size of base, adapts it for use on any machine requiring a self-contained power.

We should be pleased to furnish manufacturers or users of portable machines of any kind with full information, weights, and sizes of our different engines.
We make three sizes of gasoline hoists for builders' use.

## THE HILDRETH MFG. CO.

C. E. BEMENT, Secretary and Manager

150 Willow St.
LANSING, MICHIGAN

## 

## May, 1911.

J-M Transite Asbestos Fire made of Asbestos (rock) against fire water, J. and Cement-both minerals. Are and are not in the longer they are exposed acids, gases and chemich conditions, except
most severe weather come.
the harder and tougher they become

##  a homogeneous mast like wood are much ment non-conductors ol or inary woodworking tools.


J-M mand differed.
Come in manest Branch
ray and Indian red our Neare.
Ask


Is the new tip with which "NATIONn品mental. now equipped, both and screws into
The TIP is threaded and Plated finishes. SRIVER, makboth the JapanneTED for A SCRE anfords ready access
It is also sto to remove the tip and
ing it easy
ing the pin.
The slot also indicates $\begin{aligned} & \text { in } \\ & \text { of the butt- }\end{aligned}$
of the butt-a
penter.
These are exclusive No. 450


## U. S. Standard Cement Mixers and Block Machines <br> UR U.S.Standard Junior and Senior

 Block Machines are both built upon the same basic principles, the former building a $16^{\prime \prime}$, the latter a $24^{\prime \prime}$ long block f these machines build hollow blocks $6^{\prime \prime}$ $8^{\prime \prime}, 10^{\prime \prime}$ and $12^{\prime \prime}$ thick and veneer blocks $3^{\prime \prime}$ $4^{\prime \prime}, 5^{\prime \prime}$ and $6^{\prime \prime}$ thick. The equipment also provides plates for circular blocks, angle blocks of any desired angles, porch pier locks, chimey blocks, elc. These machines are capable of producing a greater variety of styles and sizes of blocks without additional investment than any other machine made, and for simplicity, speed,
completeness, strength and beauty of blocks cannot be equalled.
$T^{H E}$ U. S. Standard are continuous mixers. The measuring and proportioning of the cement, sand, gravel or crushed stone is done automatically. With the U.S. Standard measuring is positive, and does not vary with coarse or fine, wet or dry ingredients.

SPECLAL FEATURES-Accuracy in measurIng, correctness in proportioning and thoroughness in miring the ingredients. All these operations are automatic and absolutely relliable. Detailed
information will be furnished upon application for our_Catalog No. B.

semor No. A

THE ASHLAND STEEL RANGE \& MFG. CO.
ASHLAND, OHIO


## The Original <br> BAY STATE

 Brick and Cement CoatingProtects concrete or stucco walls, floors and ceiling Protects concrete or stucco walls, floors and ceiling
against damage from moisture and does not destroy the pleasing texture of concrete or stucco, It has been endorsed by the National Board of Fire Underwriters as a fire retarder, has been applied with great
success to the exteriors and interiors of residences, hotels, factories and mills; when applied on ceilings it does not drop off, thus preventing damage to delicate machinery. It is not affected by acids or smoke.

FOR FLOORS
It prevents floors from dusting and sanding and is admirable for hospitals and similar institutions, will stand wear and washing. Write us for particulars
about its application. We can give you the names of some of the best residences and best textile and other mills where it has been used successfully under most adverse conditions.

Address for Descriptive Booklet Dept. 12, mentionfng this medium WADSWORTH, HOWLAND \& CO., Inc. 82-84 Washington Saint and Varnish Makers and Lead Corroders
BOSTON, MASS.

## Talk As You May About Mixers

 You Cannot Get Away From This FactThat no high-charging mixer is complete without a charging hopper and elevator; that fully one-third of the power is required to operate the loading device; that one-third of the attention is required to operate it; that charging skips get out of order quickly, and that you save all of this needless expense in the low-charging, direct from barrows,

## Eclipse Concrete Mixer



## The Only

 Low Charging Batch MixerIt is charged two feet from the ground and both platforms and approaches are portable with the mixer.

And don't forget we mean exactly what we say and can supply the proof that it saves one-third of the cost-one third of the first cost and one-third of the operative cost

Better investigate the cost-saving of the Eclipse Mixer Catalog No. 32 by first mail if you say so.
The Standard Scale \& Supply Co.
Chicago
Pittsburgh
Philadelphia
New York 1345-1347 Wabash Ave. $\quad$ 243-245 Water St. $\quad 35$ S. Fourth St. 136 W. Broadway

## Keep Out Dampness

Paint Your Concrete Buildings with
R. I. W. PAINT
"REMEMBER IT'S WATERPROOF"
Sold in barrels, $\$ 1.25$ per gallon; 5 -gallon cans at $\$ 1.35$ per gallon; 2 -gallon can, $\$ 2.50$ per gallon, all F. O. B., Chicago

Proof Against Water, Acid, Fumes or Alkali Special Elastic Compound for Each Specific Purpose
The Garden City Sand Co. 709-711 Chamber of Commerce, Chicago


## These Men are Making Big Money with Ideal Concrete Machinery <br> We have told you many times and in many waysabout Ideal machines and the superior product that is produced by them. This month the men on the job-the men who are making their, that is produced by them. This month the men on the job-the men who are making their <br> W. R. Bradshaw, Wilming- <br> vantage over those made on other machines. We are having good suc- cess marketing our block, and at a nice profit. It is my opmion that <br> John B. Wolfkill, Hage $\begin{array}{ll}\text { ton, N. C. } & \begin{array}{l}\text { vatage over those made on other } \\ \text { machines. We are having good suc- }\end{array} \\ \text { cess marketing our blocks, and at a }\end{array}$ "I have before me now at least 12 months work. Every job I complete months work, Every jobI complete get another call. The Ideal Machine I bought last May deserves this credit." <br> W. B. Weare, (Dierks Lumber $\&$ Coal <br> $\mathrm{Co}_{\boldsymbol{n}}$ ) Steriling, Neb. <br> "The Ideal block machine purchased of you last spring is a money"The Ideal block machine pur- we like it fine. It makes nice blocks can chased of you last spring is a money- and we have old about 1000 blocks the maker in every way. It is saving in already. People like our blocks and tur material and quick in operation. ceaim they are better, than other the Also turns out blocks that sell to ad- block makers put out." <br> $$
\text { Send the Coupon Today for our Catalog No. } 12
$$

## Ideal 8



## MAKE THESE

## Beautiful Porch Columns

## Df Cement

- Takes TWO BUCKETS of cement, FIVE BUCKETS of sand and one hour's time. Total cost 50 cts . to one dollar each. Sell for $\$ 3.50$ to $\$ 6.00$. Big money in it for you. If made of white sand and white cement they look like cut stone or marble. Thousands in use.


## THE HOOSIER COLUMN MOLD

 makes them in one solid piece ready to set up. No sections or joints to fit up. Just what you Lumber Dealers and House Builders have been looking for.
## Send for Catalogue B

HOOSIER MHG.CO. GOSHEN, IND.

## AT LAST A TILTING BATCH MIXER <br> FOR LESS THAN THE COST OF A CONTINUOUS

## THE LITTLE WONDER

Capacity, three to four feet. Turns out a better quality of concrete than can possibly eobtained by hand mixing and at one-twentieth of the labor cost. Just the mixer for sidewalk or small foundation work, floors, etc.


Simplest mixer built. No sharp corners in drum to catch concrete. Convenient side ump. Low charge. Charges or discharges while running at full speed. Mixes wet or dry material equally well. Can be set over sidewalk forms, eliminating wheeling. chines costing twice or three times as much. Can be operated by hand.
Furnished on skids or on trucks with or without power. Write for descriptive literature. Made by the manufacturers of THE GREAT POLYGON.LINE.

WATERLOO CEMENT MACHINERY CORPORATION
111 VINTON STREET WATERLOO, IOWA

## Concrete Mixers S24 and Up

## Every Builder, Contractor, Mason or Carpenter Ought to Own a Concrete Mixing Machine

Because there are dozens of different places about every building in which concrete is used, and a machine of this kind will pay for itself in a very short time. We illustrate herewith a simple but practical and speedy hand mixer, which is made in two different types and sells for $\$ 24$ and up. It is a mixer which will save from one to two men's time per day, and will turn out the very best quality of mix in the shortest possible time. It actually mixes a batch forty-five times in one minute.

## We Manufacture Mixers of Every Style and at All Prices

No matter what you want in the mixing line, we furnish it; from a hand mixer to the largest size power mixing machines, and we sell at prices so low that every builder or contractor can afford a good complete outfit.
We manufacture everything in the concrete machinery line.
Send for Our Big Special Concrete Machinery Catalog, Showing Builders' Specialties of All Kinds

We have a line of concrete machinery built especially for contractors and builders. It shows everything required, and lists dozens of articles which every builder can use in some form or other and are an absolute necessity in such work.

Send for this book TODAY. It will save you a good many dollars and will be the means of increasing your business and profits.

## NORTHWESTERN STEEL \& IRON WORKS

Catalog 44



## PRACTICAL BOOKS For the BUILDING TRADES

THE STEEL SQUARE-TWO VOLUMES. A PRACTICAL TREATISE ON THE USES OF THE STEEL SQUARE. By Fred I. Hodgson 600 Pages, 500 Illustration
Two Vols, Cloth Binding. Price........................... $\$ 2.00$ Single Vols, Part I, Cloth. Price.
1.00

Single Vols., Part II, Cloth. Price.
Mr. Hodgson was the first-as well as the lastperson who has written on this impotan tol and the two volumes now issued contain the
earliest and the latest up-to-date methods of applying the STEEL SQUAFE for the solution of the many problems this wonderful instru ment can solve when in capable hands.
two volumes, named herewith, contain about all that is possible to be done with the square, that is of practical value to the workman, and, as they show nearly all the simple, as well as the
difficult things, that can be accomplished with the aid of this tool, there will be little trouble for the workman to work out any minor problem that may confront him, if it is within the pur-
view of the tool. In short, the two volumes conview of the tool. In short, the two volumes con-
tain all that can now, or hereafter, be accomplished with the square. They are profusely plished with the square. diagrams, and explanatory sketches, which cover the whole ground of steel
square practice. Two volumes of the greatest square practice. Two volumes of the greatest
possible value to the young carpenter. CTURAL DRAWING SELF.
BUILDERS' ARCHITECTURAL DRAWING SELF-
TAUGHT. By Fred T. Hodgson. F. A. I.C. 336 Pages, 250 Illustrations and 18 Folding Plates, 12 mo , Cloth Binding. Price ....... $\$ 2.00$ This work is especially designed for carpenters and for students of architecture, woodworkers and others who desire to learn drawing at home and who have not the means, time or oppor
tunity of taking a regular course in school, or college, nor of availing themselves of the offers made by, one or other of the "Correspondence

The work commences with a description of drawing instruments and accessories, with rules for using them, and hints as to their care and management. Rules for laying out simple drawings
and executing same are given, and the student and executing same are given, and the student
is taught step by step to draw to scale, first the plans, next the elevations, and finally the details, of a cottage, including foundations, walls, doors, windows, stairs and all other items re-
quired for finishing a small building complete in quired for finishing a small building complete in ITECTURE PARTICULARIY
EASY STEPS TO ARCHITECTURE. PARTICULARLY DESIGNED FOR HOME STUDY. By Fred T. Hodg-
 son, F. A. I. C. 350 Pages, 230 Illustra

As every mechanic employed in the building trades must necessarily have some knowedge or archim to be a great assistance in acquiring such knowledge without a great expenditure of effort. A
part of this work has been for years a sort of part of this work has been for years a sort of
text-book in schools where architecture is taught, ext-book in schools where architecture is taught, tions and answers are easily understood and as easily remembered.

The second part of the book deals more particularly with architectural styles, while the first
part is mostly devoted to the classic orders, part is mostly devoted to the classic orders,
Greek and Roman. Full explanation of the atter styles are made, and illustrations show
these styles and give a brief history of their growth and decay.
EASY LESSONS IN THE ART OF PRACTICAL WOOD CARVING. By Fred T. Hodgson, F. A. I. C. 284 Pages,

200 Illustrations, 12 mo , Cloth Binding.


Price........ ............................ $\$ 1.50$
This work, "Easy Lessons in Practical Carving,",
is prepared in the same happy, easily underis prepared in the same happy, easily under,
stood style of writing that has made the name of stood style of writing that has made the name of
the author so famous among the working men of English-speaking countries.
The lessons given in this new book begin at the very beginning of carving and lead the young
workman by easy steps through the mazes of the art, until he is able to turn out work of a creditable character. The use and care of carvers' tools are given and explained, and the tools described and shown in illustrations, with meth-
ods of sharpening and honing the tools, in a clear and interesting manner. All necessary appliances are shown, described, and illustrated, both for holding the work, and for preparing the tools and finishing up the carvings. The
various styles of carving are fully explained, such as flat carving, chip carving, incised carving, scratch carving, figure carving, carving in
relief, round carving and jewelry carving.

Any of the above books sent Post or Expressage Prepaid on receipt of price.

MODERN CARPENTRY AND JOINERY-VOL. I. By Fred T. Hodgson, F. A. I. C. 300 Pages, 318 Illustrations, 12mo, Cloth Binding. Price.


This is a real modern work, and the large numlion) is an evidence that American workmen have found in it the things they expected. It is one of the best books of the kind ever brought out for teaching the young workman the art of
correct and easy wood-working. It shows how to lay out roofs, ratters, stairs, hoppers, bevels of all kinds, mitering, coping, circle work, flooring, splayed work, plain stairs and handrailing, cornicing, dove-tailing and many other
things the young carpenter will require to know in the performance of his regular work know is written in a very simple style, and can be understood by any person who can read everyday English. Unike other works prepared for
workmen, it is void of bewirdering pormulae and algebraic puzzles, and the reader is not asked to wade through long mathematical calculations to get at the kernel of the subject before him. The work contains some 300 illustrations and
diagrams, all of which are explanatory and in. diagrams,
structive.
MODERN CARPENTRY AND JOINERY-VOL. II. AD By Fred T. Hodgson, F. A. I. C. 400 Pages, 300 Illustrations, 12 mo , Cloth
Binding. Price.. .................. $\$ 1.00$


This voluree is somewhat similar to Vol. I, only on advanced lines, and is intended to follow up the progress made by a study of the first. In-
deed, it is simply a continuation of the first volume, on a higher plane, and no workman having, mastered the contents of one, wifk rest
satisfied, antil he has also mastered the contents satisfied, until he has also mastered the contents of

This volume contains some examples of work, with a description of the way the work is performed,
and the materials employed. Many very diff:cult problems are here shown and the solutions and explanations are given and fully explained, many things that at first seem formidable to the tion under the magic wand of the author's method of explanation.

COMMON SENSE STAIR BUILDING AND HAND-RAIL-
ING. By Fred T. Hodgson, F. A. I. C. 300 Pages, 300
Illustrations, 12mo, Cloth Binding. Price................... $\$ 1.00$

his is an excellent work for the young carpenter
who is ambitious of becoming an who is ambitious of becoming an expert in hand.
railing and stairbuilding inasmuch as it com. railing and stairbuilding, inasmuch as it com-
mences at the very beginning of the art, and shows how to lay off a stair on the floor, placing the newels, laying off treads and risers, strings,
winders, wells and

The object of the author is to lead the student step by step, in such a way that he takes in the whole This is decidedly the best and aware ort work on stairbuilding in the market, and jus what the untrained workman wants. The part of the book devoted to handrailing exhibits three
different methods of laying out and working different methods of laying out and working
handrails suitable for any kind of stairs, straight circular, elliptical, or for stairs with landings doglegged, newels, or cylinders. These systems of handrailing have been taken from the best
sources on the subject, and have been revied sources on the subject, and have been revised
and edited in the most careful manner.

PRACTICAL BUNGALOWS AND COTTAGES FOR
TOWN AND COUNTRY. Arranged and Edited by Fred
Cloth, 420 Pages, 400 Illustrations. Price................... $\$ 1.00$


This work contains perspective views and floor plans of over two hundred choice bungalows, great care to combine architectural beauty, convenience and economy of construction, ranging in prices from $\$ 500.00$ to $\$ 3,800.00$. Every plan been built from, to the entire satisfaction of the builder and within the estimated cost. This work will be found invaluable to the home builder,
furnishing many new and up-to-date ideas and furnishing many new and up-to-date ideas and
suggestions in modern arehitecture. The number of California bungalows, which the editors have taken great pains to select, are without question the most attractive modern low cost homes ever built. We are prepared to furnish blue prints
at a . very moderate cost, ranging from $\$ 5.00$ to $\$ 15.00$, according to cost of erection, consisting of floor, roof and foundation plans, front, side
and rear elevations, with complete type-written and rear ele
specifications.

## Address: <br> HODGSON BOOK COMPANY <br> 358 Dearborn Street CHICACO, ILL.

## $\$ 3895$ BUYS COMPLETE BATHROOM OUTFIT



## MODERN PLUMBING AT $1 / 2$ ORDINARY COST

I WATER PRESSURE SYSTEMS, from $\$ 42.00$ up. I HOT WATER AND STEAM PLANTS. Save $\$ 100$ to $\$ 250$ on a Heating System. Plans free with every plant. I PIPE, VALVES, FITTINGS at Lowest Prices. All high grade, strictly guaranteed goods. Catalogue free.

## JOHN HARDIN \& CO.

Established 1876
4551 Cottage Grove Avenue, Dept. T CHICAGO

## The 20th Century Bricklayers and Mason's Assistant By FRED T. HODGSON

 This work is in two parts combined in one volume, all kinds; and this includes an explanation of the various erms employed in the trade with illustrations and defiThere is a chapter on Foundations which goes into the matter at great length, and is fully illustrated and axplained, and which shows how to lay out and propare ny kind or shape of foundation, which tho various methods of constructing damp courses Various methods of forming and explained are ohown, quoins and pands are explained, illustrated and described, olnts in brick work are illustrated, described and explained in a separate chapter in which the kinds of morar to employ for various works are defined. Chimne7 kinds are described and illustrated.
Brick bonding for all sorts of work is shown and fllustrated by a large number of diagrams and the manner of bauged and ungauged, are explained at length, and a large number of illustrations areshown, giving methods of describing the arches and obtaining the joints for same. Bay and oriel windows are discussed and the methode of working them are shown and described both by text and diagrams, Methodily deacribed. The tools, used;by the bricklayer and his helpers are fully ilustrate and described. Brickiayors' mortar_and other useful memoranda close Part One of the book, Part

Part Two deals with the stone mason's work altogether and opens with a chapter scribed and as fully illustrated, with explanations and methode of using them. The trade names of wrought stones are given with illustrations showing the work in prorress and in a finished state; also methods of woricing them. Methods of building walls ia squared rubble, picked polygonal ragwork and other styles of work are oxplained and flustrated. Finished stones such as window sills, window heads, copings, arch stones, Koy atones and other dressings are described and illustrated. Stone arches and joints are described and illustrated, with amplo instractions for working them. A chapter on tions showing how the work is done. There is also a chapter explaining the method of building a circular headed window or door in a circular tower or other circular wall. A chapter on estimating stone work, with a copious specification is also incluced along With a short traatise os building sikew arches and skew brigges, and which is inumber of diagrams and working sketches, showing how to do the work in a propor manner. This part is illustrated with over 200 working drawings and diagrams. The whole work contains over 450 fine iflustrations and diagrams, and is completto cyclopedia of practical instructions in brick-work and masonry and must, prove of inest
timable value to the operative bricklayer and mason. 12 mo ., cloth, price, $\$ 1.50$; hil leather $\$ 2.00$.

HODGSON BOOK CO., Publishers 358 Dearborn St., CHICAGO


## The Recognized Authority

$\mathrm{E}^{\mathrm{ACH}}$ issue of 72 to 80 pages is complete with instructive articles finely illustrated by half-tone cuts, artistic designs for moderate cost homes, contributed by leading architects. A year's numbers furnish a splendid variety of strictly new and high class work.

## Construction Problems

 with A series of articles by architcect H. Edw. Wralker now rumning in Keith's Magazine; ñuber. Send in your subscription and book order NOW to start witho our BIG APRIL
## KEITH'S BOOKS OF PLANS

are known and sold all over the world. Get a Plan Book with a reputation behind it. Get "KEITH'S" and "Do It Right."

$$
\text { KEITH'S books at newsdealers or direct } \$ 1.00 \text { each, are :- }
$$

Vol. I-215 Plans for Bungalows and Cottages costing less than $\$ 3000$ Vol. III-200 " "Attractive Homes costing. ...... \$2000 to $\$ 4000$
Vol. IV-175 " $\quad$ " $\quad$. $\quad$.
Vol. V-175
Vol. VI-125 " " " " "
Vol. VII-100 " "Cement, Brick and English Half Timber Houses
Vol. VIII- 50 " "Modern Garages costing ....... $\$ 200$ to $\$ 2000$ Vol. IX-182 Beautiful Interior Views of living rooms, fireplaces, etc. Vol. X-172-p. book, "Practical House Decoration," illustrations and studiee

## SPECIAL OFFER

Send $\$ 2$ and I will mail you any one of these $\$ 1$ books, enter you for a 1911 full year's subscription to KEITH'S monthly magazine and mail you now 3 numbers published in 1910. ( $\$ 3.00$ value for $\$ 2.00$.)

$$
\begin{aligned}
& \text { Any } 3 \text { books and a year's subscription } \$ 5 \text {. } \\
& \text { Fill Out This Coupon and Mail Today }
\end{aligned}
$$

M. L. KEITH, 681 Lumber Exchange, Minneapolis Dear Sir:
Ihe well known KEITH your Special Offer and enclose $\$ 2$ for a year's subscription to
 numbers extra and one of your 81 books. 1 have shich please mail to me at once.

Signed

Address

PASTE THIS DOME ON LETTERS
THAT YOU WRITE ADVERTISERS.
IT WILL HELP.

# 6 MONTHS FREE TRIAL 



## Special Offer on Shop and Factory Outfit

We want every carpenter, every shop, factory, contractor and tool-user to try this grinding, buffing and polishing outfit for six months free -a whole half year for you to find out how this perfected genuine Carborundum grinder saves tcols, saves time, and earns money for any shop, factory or individual tool-user. We want you to prove these facts on your own tools. The whole half year's use will cost you nothing. Try it free for
6 months is what we ask and prove it is a big money6 months is what we ask and prove it is a big money-
maker for you. Then send it back, if you' wish-no hard feelings if you do. Send back the coupon at the bottom of this page for our 6 months' free trial offer.

# Luther Diamond Tool Grinder 

## 25 Times Faster Than The Grindstone-6 Times Faster Than Emery Wheels

The wheels of this grinder are genuine Carborundum. Nothing is so hard as Carborundum except the genuine diamond. Wheels actually made of genuine diamond would cut no faster. In reality Corborundum c ystals are artificial diamonds, made by fusing the elements of real diamonds in the electric furnaces at Niagara Falls, in which fire brick melts and runs like butter. In this utmost heat, Carborundum crystals get a temper and sharpness that cuts hardest steel or toaghest malleable iron as emery does copper. Carborundum whecls do not glaze -they peel steel away in tiny shavings at lightest touch-no hard pressure necessary, no frictional heat, no water cooling necessary, no danger of drawing temper. Genuine Corborundum wheels do not get soft in spots, wear lopsided or glaze. They will outlast any number of emery wheels, saving that much money. They make it so easy to keep tools keen and bright, that tools are kept that way, and that means more, faster and easier work. They will not draw temper and tools last longer, which means another saving - to say nothing about the time saved in sharpening. But don't take our word-prove these facts by a half year's free use of this splendid outfit.


## Read what others say

Elmwood Haynes, of the Haynes Auto-
mobile Co., says: "I have found your mobile Co., says: "I have found your
machine a very satisfactory device," Most Practical Grinder Made I receivel the Carborundum Grinder and am highly satisfied with it. I consider it the best and most practical allpurpose machine so far manufactured.
Alien StoodiEy, Goldfield, Nevada. The Best Grinder I $m$ well pleased with your arind I am well pleased with your grinder. It

What Neighbors Say Your grinder does everything you claim for it and more too.
I have shown it to my neighbors and they say it is one of the finest things they ever saw. Law Knuston, Leland, Ill Just As Represented I have just received the at represented. I am very well at represented. I am very well
pleased with it.
C.H.Trompsos, Cheyenne, Wyo.

## 11 TOOLS III ONE



## 5



7


Built Like a High Grade Lathe
The Luther Mechanic's Special, forming the basis of this Special shop and factory outfit, is built for a lifetime of service-has steel and malleable construction, dust-proof, bronze bearings, machine cut spur gears, bearings run in oil bath-speed 2,500 revolutions per minute. Carborundum wheels guaranteed 5 years.

## Return this Coupon for 6 Months FREE Trial Offer on Special Shop and Factory Outfit

By returning this coupon you will not put yourself under any obligation whatever. We will send you full details of our Six Months' Free Trial Offer, and full description of this splendid grinding, buffing and polishing outfit, also the reprint from McClure's Magazine telling the interesting story of the discovery of Carborundum. Everything we send is free, and puts you under no obligations. If you want to increase shop production, save time, or make your work easier, let us tell you about this grinder.
Send back the coupon today.

## LUTHER GRINDER MFG. CO. <br> 55b Madison Street <br> MILWAUKEE. WIS.

55b Madison St., Milwaukee, Wis.
Please send me free and prepaid your free Carborundum booklets and 6 months' free trial offer on special shop and factory outfit.

[^2]Address
Dealer's Name
Address

## MANTELS



We will mail to you
E E E E
a copy of our 50 page
MANTEL CATALOG
Showing the best selection of mantels at the most
Reasonable Prices
If you are building a home, don't delay, write today for a catalog. It will be money saved for you. Special Prices to contractors and builoers.
Moormann $\&$ Otten
611-613 Main, Cincinnati, 0.

SPECIAL OFFER TO CARPENTERS

CARPENTER'S SPECIAL
Try it Until your dealer becomes stocked with this new Try it trial, express paid, for $\$ 1.00$. Try it ten days. at Our $\quad$ back, $\quad$ If not satisfactory return and receive your dollar PIKE MFG. CO PIKE, N. H. Our

COMBINATION INDIA We want every carpenter to try this oilstone which was designed solely for carpenter's
use. In addition to above offer we will include an attractive glass top souvenir sharpen-
ing stone with every order on condition you mention your dealer's name in your reply.

## OTTUMWA SASH PULLEYS



Are the best for you to use and specify.

NOTE THE LARGE BEARING

Insures Smooth Action and no Noise.

SAMPLES FREE
No. 109 Cone Bearing JOHNSTON \&े SHARP MFG. CO., $\quad-\quad$ OTTUMWA, IOWA


Brick-Stone-Tile-Concrete, ANYBODY interested in building will benefit by the knowledge gained from a demonstration of the use of the
SEBCO EXPANSION BOLTS Tell us the kind of work you are doing, we will send samples and catalog that will help you and show you a way to save money STAR EXPANSION BOLT COMPANY Catalog Dept. 30 147-149 Cedar Street, NEW YORK
"RED TOP" ASPHALT SHINGLES
Make the Most Beautiful and Lasting Roofing FOR BUNGALOWS AND FINE RESIDENCES

They are Manufactured in Red Granite,
Gray-Green and Red Slate Colors
in $8 \times 13^{\prime \prime}$ sizes of pureall-wool felt and the best asphalt The exposed sides are covered with real slate chippings which are embedded so perfectly
"Red Top" Asphalt Shingles are Guaranteed for Ten Years They cannot curl, peel or blister and are weather and fire-proof, and are
cooler in summer-warmer in winter.

Write for Samples, Catalogue and Prices
The Cincinnati Sheet Metal and Roofing Co.
36-40 Main Street CINCINNATI, OHIO


## MULLINS Finials and Weather Vanes

of Copper and Wrought ${ }^{7}$ Iron are artistic and durale. The highest quality of workmanship and materials enter into their making.
Our line of stock designs is very complete in style and size, and finial bases can be readily changed to fit the shape and pitch of any tower at slight additional cost.
Estimates promptly furnished on special designs Complete illustrated catalog mailed on request.
W. H. MULLINS COMPANY

Franklin Street, Salem, Ohio

## STAIN AND PRESERVE YOUR ROOFS

 A handsomely stained roof gives distinction to the commonest house, and the rich, velvety moss-green and tile-red shades ofCABOT'S
Shingle Stains not only beautify the shingles, but thor oughly preserve them They are made of Cre- $\mathrm{p}_{\text {, Train \& Williams, Architects, Los Angeles, Cal. }}$ osote, "the best wood ${ }^{\text {reservative known," }}$ and the finest and strongest colors, ground in linseed oil. They cost half as much as paint, can be applied at half the labor cost, and are suitable for shingles, siding, and other exterior woodwork. You can get Cabot's Stains all over the country. Send for samples and name of nearest agent.
SAMUEL CAB0T, Inc., Manfg. Chemists, Boston, Mass. 350 Dearborn Av., Chicago

## DEMING PUMPS



Belt Driven Deming Triplex Power Pump
HENION Q HUBBELL, CHICAGO Other Agencies in All Principal Cities

## THE



THE MAYFLOWER FRAME HOUSE, built at Omaha, Nebraska NATIONAL BUILDER DESIGN No. 341

I. P. Hicks, Architect, Omaha

For Floor Plans, Elevations and Details, See Supplement of this Number. Estimated, Cost $\$ 1.988 .75$

## THE MAYFLOWER FRAME HOUSE

Our supplement sheet for May shows a $\$ 2,000$ house of five rooms, reception hall and bath. This house was recently built at Omaha, Nebraska, from the plans of I. P. Hicks, architect. The actual cost as detailed in the adjoining estimate was slightly under the $\$ 2,000$ mark. In some sections of the country this cost would be changed by local conditions, material and labor, but it should be possible to calculate the changes from the detailed estimate.

A great many inquiries are made regarding cubic foot cost. In this case we have a building 24 ft . wide, 28 ft . long and about 28 ft . from the basement floor to a point two-thirds up on the roof, making $18,816 \mathrm{cu} . \mathrm{ft}$. At the price quoted, the cubic foot cost would be 10.6 cents; about right for this class of building.

Particular attention is called to the grouping of the rooms on the first floor. The parlor and kitchen are entered from the hall, and the dining room from both the parlor and kitchen. On the second floor the sloping roof allows two good bedrooms with ample closet space, which, in a house of this character, is preferable to a third-story attic. The house could be built on a narrow lot, as all the rooms have either a front or rear exposure.

## ESTIMATE OF THE MAYFLOWER

By I, P. HICKS
excavating and masonry.

Cement stone caps, porch piers, etc. . . . . . . . . . . . . . . . . . $6 .{ }^{2} 75$
30 lineal feet $8 \times 12$ flue chimney, $\$ 1 \ldots . . . . . . . . .$. . . . . . 30.00
Total excavating and masonry..................... . $\$ 162.00$ LUMBER BILL. Feet.
$16 \times 8 \times 18$ ft. girder ..... 72
$16 \times 8 \times 10 \mathrm{ft}$. girder ..... 40
$16 \times 6 \times 14$ ft. post ..... 42
$46 \times 6 \times 14 \mathrm{ft}$. sills ..... 168
$46 \times 6 \times 12 \mathrm{ft}$. sills ..... 144
$46 \mathrm{x} 8 \times 12 \mathrm{ft}$. first floor joists. ..... 730
$232 \times 8 \times 24 \mathrm{ft}$. second floor joists. ..... 736
$342 \times 4 \times 12 \mathrm{ft}$. collar beams. ..... 272
$562 \times 4 \times 12 \mathrm{ft}$. outside studding. ..... 448
$422 \times 4 \times 18 \mathrm{ft}$. rafters ..... 504
$242 \times 4 \times 10 \mathrm{ft}$. dormers ..... 264
$122 \times 4 \times 14 \mathrm{ft}$. gable studding ..... 96
20 2x418 ft. gable stuading ..... 176
$362 \times 4 \times 18 \mathrm{ft}$. first story partitions$602 \times 4 \times 16 \mathrm{ft}$. second story partitions.$542 \times 4 \times 16 \mathrm{ft}$. plates$72 \times 6 \times 22 \mathrm{ft}$. porch joists432- 2x6xiz ft. porch joists660594
$52 \times 6 \times 16 \mathrm{ft}$. porch joists, girder, etc. ..... 154
$122 \times 4 \times 12 \mathrm{ft}$. porch ceilings ..... 80
96
$162 \times 4 \times 18 \mathrm{ft}$. porch rafters ..... 168
$162 \times 2 \times 18 \mathrm{ft}$. furring ..... 72
24 1x6x12 ft. braces, No. 1 com. ..... 144
$141 \times 4 \times 12 \mathrm{ft}$. bridging No. 1 com56
$122 \times 4 \times 14 \mathrm{ft}$. coal bin.
Total feet framing lumber.6,496
6,496 ft. framing lumber, $\$ 27$ ..... $\$ 175.39$
$2,700 \mathrm{ft}$. 8 -inch No. 2 Y . ..... ndoutside walls, $\$ 27$72.90
1,600 ft. No. 1 Y. P. flg., $\$ 40$ ..... 64.00
$1,800 \mathrm{ft}$. 4 -inch siding, $\$ 32$.48.60
$1,350 \mathrm{ft}$. X 6 Y . P. sheathing, $\$ 26$ ..... 35.1013,750
51.37
5 rolls red rosin paper, 75 c .
300 lieal ft. $1 \times 6 \times 12$ to 16 ft . fir finish, $\$ 45$. ..... 3.75
180 lineal ft. $1 \times 8 \times 12$ to 16 ft . clear fir finish, $\$ 45$ ..... 5.40
140 lineal ft. $1 \times 12 \times 12$ to 16 ft . clear fir finish, $\$ 45$310 lineal ft. $1 \times 4 \times 12$ to 16 ft . clear fir finish, $\$ 45$6.304.63
11 pieces $11 / 8 \times 4 \times 12 \mathrm{ft}$. clear fir finish, $\$ 45$2.47
3 pieces $11 / 8 \times 4 \times 16 \mathrm{ft}$. clear fir finish, $\$ 45$95
2 pieces $11 / 8 \times 6 \times 10 \mathrm{ft}$. clear fir finish, $\$ 45$ ..... 58
4 pieces $11 / 8 \times 12 \times 14 \mathrm{ft}$. clear fir finish, $\$ 45$ ..... 1.17
$220 \mathrm{ft} .1 \times 4 \times 16 \mathrm{ft}$. fir flg., porch, $\$ 45$ ..... 9.90
180 ft . $5 / 8 \times 4 \times 14 \mathrm{ft}$. Y. P. ceiling, porch, $\$ 32$ ..... 5.76
$480 \mathrm{ft} .5 / 8 \times 4 \times 12$ to 16 ft . Y. P. ceiling, cornice, $\$ 32$ ..... 15.36
120 ft .1 x 12 x 12 ft . Y. P. finish, shelves, etc., $\$ 45$. ..... 5.40
Total lumber bill$\$ 515.78$
MILL WORK.
5 cellar window frames, $12 \times 16,2$ light, $\$ 1.75$\$ 8.75
5 cellar sash, $12 \times 16$, 2 light, $\$ 1$5.00
1 door, 2 ft .6 in. x 6 ft .6 in., $13 / 8,4$ panel ..... 2.00
1 O. S. door frame, $3 \times 7$, rab. $13 / 4$ in ..... 2.50
2 . S. door frame, 2 ft .8 in . $x 6 \mathrm{ft} .8 \mathrm{in}$., rab. $13 / 4 \mathrm{in}$,, $\$ 2.25$ ..... 4.50
1 window frame, $44 \times 40 \times 16,2$ light
1 twin frame, $28 \times 28$, 2 light
1 twin frame, 20x24, 2 light
twin frame, 20x24, 2 light.3.00 50
1 window frame, 28x28, 2 light ..... 4.50
1 window frame, 20x24, 2 light2.25
2 window frames, 20x20, 2 light, $\$ 2$ ..... 4.00
1 sash frame, 20x30, 2 light ..... 1.80
1 twin frame, 20x24, 2 light ..... 4.50
1 triple frame, 20x24, 2 light. ..... 6.75
1 window, $44 \times 40 \times 16,2$ light.3 windows, $28 \times 28,2$ light, $\$ 2.25$.7.00
6.75
windows, 20x24, 2 light, $\$ 2.00$16.00
2 windows, 20x20, 2 li3.60
1 sash, 20x30, 1 light1.60
1 front door, 3 ft . $\times 7 \mathrm{ft} . \times 13 / 4 \mathrm{in}$18.00
O. S. doors, 2 ft .8 in . x $6 \mathrm{ft} .8 \mathrm{in} . \times 13 / 4 \mathrm{in}$., $\$ 5$ ..... 10.00
door, 2 ft .6 in. x 6 ft .8 in., 5 panel.2.50
4 doors, 2 ft .8 in. x 6 ft .8 in., 5 panel, $\$ 2.60$ ..... 10.40
4 doors, 2 ft .4 in . x 6 ft .8 in ., 5 panel, $\$ 2.60$ ..... 10.40
1 door, 1 ft .6 in. x 6 ft .8 in ., 5 panel. 50
1 set jambs, $2 \mathrm{ft} .6 \mathrm{in} . \mathrm{x} 6 \mathrm{ft} .8 \mathrm{in}$. .....  70
4 sets jambs, 2 ft .8 in . x $6 \mathrm{ft} .8 \mathrm{in} ., 70 \mathrm{c}$ ..... 2.804 sets jambs, 2 ft .4 in . x 6 ft .8 in .2.80
1 set jambs, $1 \mathrm{ft} .6 \mathrm{in} . \mathrm{x} 6 \mathrm{ft} .8 \mathrm{in}$.70
1 set jambs, 4 ft . $\mathrm{x}^{7} \mathrm{ft} .6 \mathrm{in}$. ..... 90
1 cased opening col. and pedestals ..... 35.00
68 casings, 6 ft ..... 9.16
20 casings, 5 ft ..... 2.00
180 lineal ft. head casing ..... 3.60
180 lineal ft. cap mold ..... 3.60
180 lineal ft. fillet


## TARSUS LIGHTED BY ELECTRICITY

THE ancient city of Tarsus, Asia Minor, has recently been in troduced to the modern electric light. The power is taken from the Cydnus river, which has a very rapid flow. About a mile and a half from the city, an eighty horse-power turbine is used to drive a large dynamo, which furnishes sufficient power for sustaining one thousand lamps of sixteen candle-power each. Four hundred and fifty of these are used to illuminate the streets of the city, and the remainder will be furnished to private consumers.


Prayers for the killed by fire and by falling, and the destruc tion of death-traps are all very well; but the prevention of fires in overcrowded buildings, and efficient provision for the escape of the people cooped up in such buildings would have a better effect on the living.

The 145 young lives snuffed out by the late fire disaster in New York, following as it did, on the heels of the City of Newark holocaust, almost makes one's blood run cold, and to ask ourselves the question, "Whose turn will it be next?" It seems strangevery strange-that in a country like this, a country that boasts of its great progress in all the arts, sciences, inventions, and improvements, that such life-destroying disasters should be possible. "There is something rotten in Denmark!"

We are constrained to ask why it is that hundreds-maybe thousands-of working people are crowded into the top stories of cloud-touching structures, when, in this land of magnificent distances, there is plenty of room directly on the face of mother earth, to accommodate all the workers in the universe?

If we must "hive" the boys and girls in city buildings, why not keep them down on the ground floors, or certainly not higher than the third floor up. Large windows to raise or open as doors, could be provided in the front and rear, or in the sides, if the building permits of such an arrangement would admit of exit under fairly safe conditions. It would be better to construct modern city buildings intended to be used as workshops, so that they could truthfully be called "Life-safe" buildings, instead of fire-proof. The designation would be much more Christian-like, for "fire-proof" spells for the protection of property-dollars and cents-while "life-safe" buildings, covers something much more precious than Mammon's gifts.

$$
*
$$

The National Builder is of the opinion that so long as workers are hived in upper stories or "lofts," there will be no exemption form these dreadful disasters, and in order to lessen their virulence and frequency, each city or state should enact drastic laws, compelling employers to furnish "safe buildings" for their people to work in, and the authorities should see to it, that all laws regarding the matter of safety are strictly and determinedly enforced. The peoples' lives should not be endangered for either gain or loss in money. In many of our large cities there is much need of profiting by these terrible lessons, for it is reasonable to imagine that many workers are employed under conditions which envolve continuous exposure to danger. Few realize that to say a building is fireproof means nothing more than that the structure itself can pass through a fairly serious fire with only a moderate amount of damage. Such a building really offers little additional security for the goods it contains or the people who occupy it if no other precautions against fire are taken. Safety for the occupants must be sought through other means. This may seem so elementary a fact as to be hardly worth stating, yet the public often fail to comprehend it. No precaution in construction can obviate the necessity for fire escapes. The laws are fairly comprehensive. but the lesson of New York's experience is the need of careful and continuous enforcement.

The New York World says: "1. That there are hundreds of factories, office buildings, storage-warehouses, and lofts without any means of escape from fire provided.
"2. That most of the big hotels are either without any fire escapes, or with totally inadequate provision for escape.
"3. That big, new apartment houses on the upper west side, the last word in buildings of that character, are totally without fire escapes.
"4. That scores of schools, asylums, hospitals, and similar institutions are without proper protection for the inmates in cases of fire."

Of 1,463 cloak and suit factories recently investigated by a committee of the Joint Board of Sanitary Control of the Cloak and Suit Industry, which represents the manufacturers, the unions, and the public, we learn that 1,173 , or 97.5 per cent, had hall doors opening inward, instead of outward as the law requires; 491 had no fire-exits except one fire escape; 60 had halls less than three feet wide; 28 had doors leading to halls and stairways locked during the day, and 14 had no fire escapes.

This is a frightful state of affairs, and is simply a forecast of another, and perhaps a worse disaster than that of Washington Place.

The architects of Chicago seem determined to declare war on the plumbers and steamfitters' unions, if these latter do not agree to submit their difficulties to arbitration. The arehitects say: "If the men in the trades do not alter their course and settle their difficulties at once, the architects will get the work done outside the unions. They must not expect us to lose thousands of dollars through their quarreling." It is expected trouble will grow out of this matter if the difficulties are not settled and the architects get their work done outside the unions, as violence is threatened. It is to be hoped the matter may be settled before extreme measures are taken. Doubtless there is room for complaint on both sides.

The basis of all the applications of reinforced concrete is that the two materials entering into its combination-namely, steel and concrete-shall be used to assist and strengthen each other in those properties and directions in which one or the other is deficient. And the most important of these is that concrete, which is a cheap material, shall be used to display its characteristic property of compressive strength, and steel to take the tension in which the concrete is weak. Concrete will bear a larger crushing load, but it is brittle, and will break across if loaded as a beam. However, steel is not only used to resist tension-it is often used to strengthen the concrete in compression. The two materials possess as a combination properties which are seemingly different from those of either alone. It is this result which led some persons to acclaim that reinforced concrete was a novel material, and deserving of a new name. The name "ferro-concrete" is not entirely happy, because it suggests its literal interpretation of iron-concrete, which would imply a concrete in which the aggregate was bound together by a rust-cement, such as that made with iron filings and sulphur, or that the ingredients are united by iron rust simply. The French early called it "Béton Armé" or "Cement Armé." The latter is inappropriate for concrete, because it only refers to cement; the former title is better, and its nearest English rendering is "Reinforced Concrete," though another translation sometimes used is "Armoured Concrete," which is quite inadequate, for the concrete is not protected by a sheathing or armour as the name suggests. Then we have the American term, "Concrete-steel." This is, however, a hybrid that does not signify in any degree the nature of the combination-it might means anything to do with concrete or steel. Reinforced concrete is, of course, not quite happy, for it gives undue importance perhaps to the concrete, though that is the most striking feature of the dual material, but still it seems the best we have, so it meets with most favor.

The Third National Conference on City Planning is being held this year at Philadelphia, on the 15th, 16th and 17th of this month. Since the very successful conference at Rochester in May of 1910, the value of such a meeting is becoming more generally recognized not only among architects and engineers, but among city officials of broad view, and business organizations of progressive spirit. The conference is not a sporadic producer of academic papers. It is the forum where those who are handling large city problems exchange views. It achieves for the development of the city what an industrial congress achieves for the development of industry. Since the emphasis is laid on free discussion of city planning ideas, ample opportunity will be given throughout the sessions and at informal round table conferences to bring out these ideas. Prepared papers will serve merely to guide the discussion into specific channels and avoid waste of time in random talk.

## YOUR MECHANIC'S LIEN RIGHTS

## By AN ONLOOKER

A mechanic's lien is a claim which one person has upon another's property for which materials or labor, or both, have been furnished toward its construction or improvement.

We think there is no good reason that can be given which should allow you to permit your lien rights to expire.

Even though the owner is a perfectly honest man, and declines to pay what is due, it is a sufficient reason for you to protect your rights by placing in due season a lien on the property. After the right to file has passed, you will find it harder to settle and collect what is owing you, should there be a question as to charges made for extra work done.

Where you are fully satisfied of the owner's ability to pay there can be no objection to your taking his note in payment. You would probably find it possible to discount it at the bank and thus have use of the money.

If the building or property is in the name of the wife, be sure and have her sign the note as one of the makers. Should it then be necessary to bring suit on the note for non-payment, you can hold her too, and the property, if not sold in the meantime, is subject to execution.

Get a judgment note if you possibly can. If in taking the note you are waiving your lien rights, you will probably find the owner will not object to signing a judgment note. It simply means that there is power of attorney given, authorizing entry of judgment by confession in default of payment. Thus the means of collection is easier, for judgment can be more quickly had and execution filed without the necessity of first bringing suit on the note.

It would do no harm to become perfectly familiar with the laws of your state covering lien rights. There are probably many things you would not do if you knew the laws, whereas, not being familiar, you tie up money in doing some work and probably never get it back.

A contractor's business is to do the work and get paid for it. It's his duty at the time of taking the work to know where the money comes from to pay for the work to be done. The most successful contractors do not hesitate in turning down work where the money is not already up for payment of the bills. They, therefore, have little occasion to worry about the necessity of filing liens.

Just stop one minute and consider how careful a banker is to get security before loaning money. There is no reason why a contractor should not use as much care in being secured for payment on work done.

To what extent does the Mechanic's Lien Laws of your state protect you? It is part of your business as a contractor to see that you are properly protected as to payment for work you do.

Better look into this, and if your state laws give you no right to place a lien, better take it up with your State representative.

Now is the time to look for spring work. Get what you can at a fair price, but don't be anxious for jobs on which you give all the profits and then some.

A good buyer, not alone considers the price, but quality as well. Then too, the question of delivery enters in, unless you get the goods, no matter what the price may be, it is not a good purchase. Quality is really the first point to consider, then the question of delivery, and lastly the price.

We know of contractors who will take on but one house job at a time, claiming they make more money during the year, than when they have many jobs to do. The reason given is that they are always on hand to personally direct the work, thus hastening its construction and avoiding errors by being there to direct the work. No one knows better than he does what is to be done, and his instructions can be safely followed.

We have quite often heard it said that a carpenter-contractor is a consumer and as such should buy his goods at home. There is plenty of room for a discussion on this subject. What say you?

It has been noticed that the farmer as a whole prefers to buy his own materials for the buildings he puts up, getting carpenters by the day to do the work. He expects, of course, to help out on the job, for at the time he builds he has little to do.

Its a good way of saving money at the expense of the contractor.

And by the way, this same farmer will let his machinery remain out in the open, unprotected from snow, rain, and sun, continually depreciating in value.

A penny wise and a pound foolish-tell him so, you contractors.
Its a good way of spending money at the expense of the contractors, as he ought to build sheds to protect them.

## MATERIALS PRACTICALLY FREE By H.

You have read advertisements wherein you were offered something for nothing, and you got something, thought not what you expected.

You will wonder at one saying that you can build with materials that cost you practically nothing.

It's been done in the past, and is being done every year, and will continue to be done, but only by careful and saving contractors.

There is a man named Jones, who has built a dozen small cottages, and still owns them, from materials saved from new buildings erected by him, and from old buildings torn down to make place for new ones. Nothing goes to waste. His men are trained to save in every way possible. In fact, they profit by it, for their economy gives them winter work, since Jones keeps them busy during the winter building cottages from materials saved.

Of course, he can't build each cottage complete without getting some new materials, but it is a fact, nevertheless, that the actual cost of the materials for the entire building is mighty little, and most of the materials used cost absolutely nothing, for if his men did not know they must be careful, the greater part of what he now used would be waste, carried to the wood-pit and burned up.

Its been these small savings that have made Jones rich and placed him in a position where he takes on old repair jobs most contractors shun. He finds less competition on a built-over house, and makes it plain in taking the job that all materials taken out of the job belong to him.

In order to care for the materials thus saved, he has built up a good sized barn, where he assorts the materials, getting them in shape to be used later.

It will be seen that he loses no time, for every moment he has to spare while at home goes to prepare these for a new house he will soon build for himself.

There are ways and ways to become independent and rich, and here is a way open to most any contractor, who, with care, both by his men and himself, can easily put in all of his time to good advantage, and soon see a reward for his painstaking.

## THE CARPENTER'S OPENING <br> By GEORGE E. WALSH



HERE is no nobler or more important calling today than that of the carpenter, and he who has learned his trade thoroughly can generally depend upon a good living. There will always be lean years and fat years, seasons when business is dull or when strikes interfere with regular work, but taken on the whole over a series of years his average income is pretty satisfactory.

But should a carpenter be satisfied with this? Should he content himself with his daily wage and never aspire to anything higher? Restlessness is said to be the universal characteristic of our nation, and we find in every walk of life men aspiring to something higher. This instead of being condemned as a sign of restlessness should be taken as a sign of honest progress. Every employee wants to become an employer, and the ambition is a worthy one.

Now the young carpenter who has learned his trade thoroughly naturally aspires to become a boss carpenter some day, a builder, a contractor, and a large employer of men. In this field he must meet intense competition, and he must take the consequences of any false step. If he gives up his position working for others he must manage to secure profits sufficient on his contracts to make up for this.

Not all carpenters are fitted by nature to work for themselves except on odd small jobs. Of five ambitious men of this line who started in business for themselves, bidding on contracts. four failed, and are now back at their old job on wages. The fifth man succeeded better than he expected, and is today a big building contractor employing nearly two hundred men. His income some years, he told me, reached $\$ 20,000$, and other years he lost rather
than made. But he is still forging ahead, profiting by his mistakes. The difference between this man and the other four who failed is not one of skill in carpentry, but one of mental make-up. He knew how to figure on a job, and knew how to handle men.

Another instance of a carpenter who succeeded as a building contractor with no such gifts as the other. What he knew he learned by experience and hard drudgery. He realized this early in life, and was therefore cautious in his work. He mastered his trade and then took small outside jobs that he could do after work hours. He took these not by the day wages, but for a lump sum. He wanted practice in figuring and estimating.

His first outside job was for a big dog house. He figured out the size of this, the cost and amount of material, and the time it would take a man at full day wages to complete it. Then he made his bid. He received the contract and came out even. He received nothing for his time and labor. Then he went over his figures and estimates carefully. His error was apparent to him then. He had made a mistake in one particular item, and that cut out his profit.

His next bid was for a shed attached to the back of a house. He made the same careful estimates, and got the contract. This yielded him a good profit. So from one small thing to another he advanced until finally he made a bid for a house. He was way under the other bidders, and he was afraid he had made some mistake. He had purposely pared down the cost of items to make his bid reasonable. He employed two men to help him. He learned from this experience two things. One was that other carpenters will not rush through work on a wage basis as fast as the man building it. He made just $\$ 300$ profit on this house, but when he calculated up his time spent on it he found he was not getting much more than half the wages of mechanics. The other point emphasized by this work was that he had based his figures on such a close margin that if there had been any slight delay or interruption in the work he would have lost. He had provided no margin for unforseen accidents and emergencies.

Now it takes a long time to figure and estimaet correctly on a big job. Experience is a great teacher, but sometimes she can be helped out by study and second-hand information; but not always. This man grown confident by his last experience made a bid for a house costing upward of ten thousand dollars. As in the first instance he got the contract because his figures were the lowest of all bidders. This time he thought he would make money and get a good start. But a number of things interfered. The price of lumber took a sudden upward jump before he could get his orders in; there was a strike in town, and he had difficulty in getting competent workmen; an accident occurred when the framework was erected, and a heavy wind storm following close on its heels swept the whole thing down. When finished the man was a thousand dollars in debt, and put out of business. There was no way to pay back the thousand dollars except to work once more at day wages and save up the money.

But there was one thing he was proud of. The house he had built and lost on was a fine piece of work. It was well designed, well put together, and every square foot of lumber in it was firstclass. It was a job that a man could point to with pride. Even in the face of failure the man had not skimped it any. Everything had been finished off completely. It was a monument to his undeserved failure.

He went back to his old job, and worked a year at it, saving up as much as he could, and paying a little at a time on the debt Then one day, after doing an odd job for a wealthy man, he fell into conversation with him about buildings. The man was considering the construction of a fine house for himself. He was anxious to get all the disinterested advice he could. A carpenter working on odd jobs would not attempt to deceive him. By degrees he learned the man's story, and then went over and had a look at the house he had built. He consulted the owner and found that it was indeed a first-class piece of work.

The sequel of the story may sound like fiction, but it was one of those true stories which we occasionally find in real life which helps to prove that facts are often stranger than fiction. The wealthy man on strength of the recommendation that house gave hired the carpenter to build his $\$ 25,000$ house. They figured on it closely together. The cost of everything was put down in black and white. The agreement was for the carpenter, who had been a contractor, to build the mansion, and receive as his pay ten per cent of the cost. It was a success. The man had a house that he was proud of, and the erstwhile failure was put securely on his feet. He paid off the balance of his debt, and had enough ahead to begin business with.

He had two houses that he could point to with pride as ex-
amples of his kind of work. Then he began bidding for work on the cost-plus-a-percentage basis. This was a new idea in that town. Many objected to it because it was new, and others took to it at once. In the end it was a very popular method of building houses. Having learned by previous mistakes and errors, the builder steered clear of pitfalls that await the hasty and careless estimator, and his bids were all of sufficient size to permit of good work and provide against delays and unforeseen accidents. His success was assured almost from the start, but it was well deserved and the result of previous failures.

Many a good carpenter today is kept from advancing because of a fear that he might lose rather than make if a big contract is taken. There are plenty of instances of where too much conservatism keeps good men from becoming good contractors and builders, and by the same token there are too many who have not sufficient conservatism to hold them back from risky speculation. The so-called speculative builder is often less a builder than a speculator. His art consists chiefly in assembling houses at the least possible cost so that they will pass superficial inspection. He is not a carpenter, not even a builder in the strict sense of the word, but simply an "assembler." He employs men of different trades to do the work for him. Sometimes he draws up his own plans, but more often he adapts them from the plans of others. Builders of this class hurt the trade; hurt the honest carpenter who tries to do his work thoroughly, and in the end casts general suspicion upon the whole contracting business.

The best builder is the man who has learned his trade thoroughly at the carpenter's bench, progressing gradually and steadily up to the positions of foreman, assistant contractor and builder, and finally to that of being his own boss and responsible man of affairs. Each step teaches him some lesson that will come in some day to help him out of difficulties. The man without such experience is apt to be a poor builder unless he can associate with him a capable carpenter who has come up through the different grades. His workmanship is bound to show in the quality of the buildings he erects, and these after all are the chief recommendations and certificate of character that tell in the long run.

## BIRD'S-EYE MAPLE

THIS beautiful wood is found both in Europe and America, but it is with the American that the present article deals, as being best known in England. Mottled maple is also a native of the latter Continent, and is principally used for picture frames. The grain of the bird's-eye maple varies as the saw divides the eyes transversely or longitudinallv, and pieces cut out in circular sweeps, such as chair backs, sometimes exhibit both the bird'seye and the mottle at different parts. The occurrence of eyes, zones, spots and small curls in the wood gives rise to figures of great beauty. Of the wood so marked, bird's-eye maple, amboyna wood, the roots or butt of the common yew, and the common maple, are, perhaps, the most beautiful. The knobby tubercles that form in the root and trunk of the common elm from the repeated stripping off of the side branches, as is the general practice, afford, occasionally, very fine specimens, which are known by the name of "curled elm."

The maple was highly prized by the Romans, especially that which grew in Istria and Bœotia, and was distinguished by its curled peacock-tail veins. Pliny says it exceeded even the citrus in value, but could be obtained only in small pieces, for writing desks and similar articles. The bird's-eye maple shows, in finished work, the peculiar appearance of small dots or ridges, or of little conical projections, with a small hollow in the center, but without any resemblance to knots, the apparent cause of ornament in woods of similar character, as the burrs of the yew, and kiaboca and the Russian maple (or birch tree), and this led Mr. Holtzapffel to seek a different cause for its formation. He states that, on examination, he found the stem of the bird'seye maple of America, when stripped of its bark, presented little pits or hollows, as if made with a conical punch, others ill-defined and flattened, like the impression of a hob-nail. Suspecting these indentations to arise from internal spines or points in the bark, a piece of the latter was stripped from another block, when the surmise was verified from its appearance. The layers of wood being molded upon these spines, each of their fibers is abruptly curved at the respective places, and when cut through, they give, in the tangential slice, the appearance of projections, the same as some rose-engine patterns, and the more recent medallic engravings, in which the closer approximation of the lines at their curvatures causes these parts to be more black.

## SPECIFICATIONS FOR REINFORCEMENT BARS

The American Association of American Steel Manufacturers, a technical body composed of 31 of the principal steel manufacturers, has adopted a standard specification governing the chemical and physical properties of concrete reinforcement bars. A feature of the adoption of this specification is the fact that it represents pioneer work on the part of the association, similar to the standard specifications for structural material and cement.

The present use of reinforced concrete requires an enormous tonnage of steel and the importance of having a standard and reliable quality is apparent. This specification already governs the manufacture of very large quantities of various kinds of concrete bars, and has been adopted by several municipalities and engineering firms, as well as the Isthmian Canal Commission and the U. S. Reclamation Service.

The society, through its secretary, Mr. Jesse J. Shuman, care Jones \& Laughlin Steel Company, Pittsburg, Pa., will send additional copies on request.

In order that our readers may be familiar with this specification, we reprint it in full as follows:
standard specifications for concrete reinforcement bars-

## manufacture.

1. Steel may be made by either the open-hearth or Bessemer process. Bars shall be rolled from billets.
chemical and physical properties.
2. The chemical and physical properties shall conform to the following limits:

| PROPERTIES CONSIDERED | Structural steel grade |  | Hard crade |  | cold. TWISTED BARS |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Plalv | deformed | PLAN | DEFORMED |  |
| Phosphorus. maximum, Bessemer open-hearth | . 10 | . 10 | .10 .06 | .10 .06 | $\begin{aligned} & .10 \\ & .06 \end{aligned}$ |
| Ultimate tensile strength. pounds per sq. in. | 55/70,000 | 55/70,000 | 80.000 ml . | 80.000 min . | Recorded only |
| Yield point, minimum, pounds per sq. in. | 33.000 | 33.000 | 50,000 | 50,000 | 55,000 |
| Elongation, per cent in $8^{\prime \prime}$, minimum | $\frac{1,400,000}{\text { T. S. }}$ | $\frac{1,250,000}{\text { T.S. }}$ | $\frac{1,200,000}{\text { T.S. }}$ | $\frac{1.000,000}{\text { T.S. }}$ | 5\% |
| Cold bend without fracture: <br> Bars under $3 / 4$ " in diameter or thickness | $180^{\circ} \mathrm{d}$ - It . | $180^{\circ} \mathrm{d}=1 \mathrm{t}$ | $180^{\circ} \mathrm{d} .=3 \mathrm{t}$. | $180^{\circ} \mathrm{d}=4 \mathrm{t}$. | $180^{\circ} \mathrm{d} .-2 \mathrm{t}$. |
| Bars 3/4" in diameter or thickness and over | $180^{\circ} \mathrm{d}=\mathrm{lt}$. | $180^{\circ} \mathrm{d} .-2 \mathrm{~L}$ | $90^{\circ} \mathrm{d} .-3 \mathrm{t}$ | $90^{\circ} \mathrm{d} .-4 \mathrm{t}$. | $180^{\circ} \mathrm{d} .-3 \mathrm{t}$. |
| The hard grade will be used only when specified. |  |  |  |  |  |

## chemical determinations.

3. In order to determine if the material conforms to the chemical limitations prescribed in paragraph 2 herein, analysis shall be made by the manufacturer from a test ingot taken at the time of the pouring of each melt or blow of steel, and a correct copy of such analysis shall be furnished to the engineer or his inspector.

## yield point.

4. For the purposes of these specifications, the yield point shall be determined by careful observation of the drop of the beam of the testing machine, or by other equally accurate method.

## form of specimens.

5. (a) Tensile and bending test specimens may be cut from the bars as rolled, but tensile and bending test specimens of deformed bars may be planed or turned for a length of at least 9 inches if deemed necessary by the manufacturer in order to obtain uniform cross-section.
(b) Tensile and bending test specimens of cold-twisted bars shall be cut from the bars after twisting, and shall be tested in full size without further treatment, unless otherwise specified as in (c), in which case the conditions therein stipulated shall govern.
(c) If it is desired that the testing and acceptance for coldtwisted bars be made upon the hot rolled bars before being twisted, the hot rolled bars shall meet the requirements of the structural steel grade for plain bars shown in this specification.

## NUMBER OF TESTS.

6. At least one tensile and one bending test shall be made from each melt of open-hearth steel rolled, and from each blow or lot of ten tons of Bessemer steel rolled. In case bars differing $3 / 8$ inch and more in diameter or thickness are rolled from one melt or blow, a test shall be made from the thickest and thinnest material rolled. Should either of these test specimens develop flaws, or should the tensile test specimen break outside of the middle third of its gauged length, it may be discarded and another test specimen substituted therefor. In case a tensile test specimen does not meet the specifications, an additional test may be made.
(d) The bending test may be made by pressure or by light blows.
modifications in elongation for thin and thiok material.
7. For bars less than 7-16 inch and more than $3 / 4$ inch nominal diameter or thickness, the following modifications shall be made in the requirements for elongation:
(e) For each increase of $1 / 8$ inch in diameter or thickness above $3 / 4$ inch, a deduction of one shall be made from the specified percentage of elongation.
(f) For each decrease of 1-16 inch in diameter or thickness below 7-16 inch, a deduction of one shall be made from the specified percentage of elongation.
(g) The above modifications in elongation shall not apply to cold-twisted bars.

## number of twists.

8. Cold-twisted bars shall be twisted cold with one complete twist in a length equal to not more than 12 times the thickness of the bar.

## FINISH.

9. Material must be free from injurious seams, flaws or cracks, and have a workman-like finish.

## variation in weight.

10. Bars for reinforcement are subject to rejection if the actual weight of any lot varies more than $5 \%$ over or under the theoretical weight of that lot.

## THE MODERN WHETSTONE

THE modern whetstone is as much an improvement on the old type as the modern automatic grinder is on the old grind stone. There may be, and probably is, many an old workmar who has infinite faith in and swears by his old oil stone that has been with him forever, and the grit and whetting qualities which he knows thoroughly, yet with due respect to the good qualities of the old time oil stone, there is no man who will view the matter with a mind open to conviction but what will have to admit that the new offerings in the way of artificial abrasive material in varnous forms for whetstones is a long way ahead of anything we nave ever had before.

For one thing they are put up more conveniently and in any variety of shapes and sizes wanted, but that is only an incident. They are put up in varieties of fineness and the variations can be made absolute, because the abrasive material is pulverized and then separated into various forms by sieving so that all of that in a given grade is absolutely uniform. And you can buy exactly the number of grit you want and get it duplicated as often as you want it. You can buy a half dozen of different grades of grit as to fineness, or you can buy one stone with one side fine for finishing off and the other side coarse for rapid cutting, and with a stone of this kind you can often save going to the grind stone, do more whetting, and get it finished off in better shape in a little while than was ever possible with the old type of oil stone.

In short, the modern whetstone is designed and put up on a scientific basis, and if selected and used in the same manner is a great aid to smooth and rapid work and should be of such satisfaction to the workman that he will always keep a good equipment with him.

## ARCHITECTURAL DETAILS--Reproduced from Batty Langley




## THE FLOWER CITY HOUSE

## By WM. J. DUNN

This house is built at Rochester, N. Y., and is the home of R. A. Joroleman. It is of pleasing design and has many new features in construction.

The exterior walls are of Portland cement pebble dash. The roofing is all of red asbestos shingles.

The roof over bay window, the hood over main entrance with their massive brackets, the dormers with their unique lines and small paned casement windows and the uniform color of the plaster work are among the features of the exterior.

The woodwork in the living room, dining room and hall, including stairs, is red gum finished in a beautiful shade of brown while the floors are of white oak.

In the living room the mantel is of new autumn tile, the hearth of red Welsh tile. On each side are bookcases with double doors having leaded diamond shaped glass while above each book case is a small window with stained glass and by each bookease is a comfortable seat.

The bay window with its half dozen stained glass windows gives ample light. This window has a large comfortable seat with radiators concealed beneath. The ceiling is heavily beamed.

French windows open from both dining room and living room to a spacious porch which has a red Welsh tile floor, making it cool and inviting on warm days.

Between the stair hall and kitchen is a toilet, and from here is
an entrance to basement. This toilet, kitchen and pantry are all finished in white tile. The pantry is large and has commodious cupboards, etc. The kitchen is also of good size and opens on a large porch at the rear. Here is an outside entrance to the basement. The entrance porch has red tile floor.

On the second floor are three large bedrooms. The front room has a large dressing room and closet. The woodwork in this room is of red gum, finished a rich red mahogany. The rear bedroom has a large alcove and closet and the side bedroom has a large closet.

Off the hall is a linen closet, also a clothes chute to basement. Brown tints prevail in the decoration and finish.

The bath is of white tile and has a tub, W. C., lavatory and shower fixtures of standard white porcelain ware with best sanitary plumbing.

All floors are of white oak, natural finish. The bedroom walls are tinted and decorations stenciled and worked out by hand, in oil. Brown tints prevail throughout the house.

There is room for a large room in attic that could be used either for a playroom or servant's room.

The heating is hot water system. The size of this house is 23 feet 6 inches by 41 feet 6 inches exclusive of porches. The cost was $\$ 5,800$. The architect is Charles William Eldridge, Rochester, N. Y.

## AN UNKNOWN TRADE

## By HERBERT

Strange as the statement may seem, it is nevertheless true that one of the most important wood-working trades remains practically unknown. When the name is mentioned people look at you in blank astonishment, utterly at a loss to know just what you mean. Either they have never heard the name before, or, if they have, guess you must have in mind a trade totally different from the right one. I refer, of course, to patternmaking. Often have I met persons who, when told my vocation was patternmaking, displayed either total ignorance, or else asked me if my business was cutting paper patterns for ladies' dresses. To meet a person who does actually know is a rare treat.

How to account for this widespread ignorance is no easy task. Still it does seem as if the most satisfactory explanation lies in the fact that the results of patternmaking fail to make a direct and constant appeal to the public eye. Mention a carpenter and everyone knows in a twinkle you mean a man skilled in all sorts of architectural wood work. Wherever they go, his work stands out conspicuously before their eyes. Speak of a cabinetmaker, and a vision of chairs and tables, of bookcases and bedroom sets looms right up before their minds. Furniture is an ever-present witness to his skill. But when we turn to the poor patternmaker, what about his handiwork? Why, you may walk through the length and breadth of a large city and never discover a trace of his work, unless you accidently happen to stumble into a foundry or pattern shop. Outside of these comparatively few places, his direct handiwork remains in obscurity, a fact which accounts largely for the prevailing ignorance of his craft.

And do you know that this important trade is totally ignored in quarters where one would least expect it? When information is required on any unfamiliar subject, where do we turn to look for it? Naturally to an encyclopedia, which is supposed to contain a library of information on almost every conceivable subject. And yet are you aware that if you consult the pages of an encyclopedia, even, you will fail to find an article on patternmaking? Other branches of the wood-working industry, such as carpentry, cabinetmaking, ship-building, etc., are treated in special articles, while no mention whatever of this subject is made.

Within the past few days the writer has taken particular pains to look into two leading standard books of reference, in hopes of finding something on the subject of patternmaking. Not one syllable did he find. Isn't this strange? Rather isn't such an omission inexcusable-to think one of the most useful, skill-requiring trades should be passed over in utter silence? It is difficult to account for such silence, unless we charitably ascribe it to an un-
intentional oversight on the part of the editors themselves, or at least of their associates, who, as specialists, are supposed to be acquainted with the various branches of manual work. However that may be, it is sad to think that persons turning to these books for light on this subject are doomed to meet with sore disappointment.

Now, I contend that there is no valid reason for relegating the patternmaker's trade to the background after this fashion. It is deserving of far better treatment. In my estimation, it is the most important of all the wood-working trades, because of its intimate relation to the large and ever-widening iron industry, constituting, as it really does, the very foundation of all these activities.

When a draughtsman, for instance, finishes the design of a machine, giving full details of the various parts of a complicated mechanism, what is the first step taken towards the actual realization of his dream or ideal? Why, the drawings are immediately put into the patternmaker's hands, whose painstaking duty it is to make a full-sized wooden pattern of each separate piece. This done, the foundryman can then proceed with his work and furnish the necessary iron castings for the machinist to build the machine. In fact, the whole machine-building process rests largely upon the patternmaker's skill. The same statement holds good also of other lines of the iron industry, notably stove work and bridge construction. In a word, to secure metal castings, whether iron or brass, for any line of work, these must first be put into the form of wooden patterns.

It appears, then, from the foregoing discussion, that the patternmaker fills a most important gap. So essential in character is his work as to merit far wider recognition. Instead of receiving lull credit due to his skill, it seems as though the machinist runs away with the lion's share of the glory. When inspecting a finished piece of machinery, whose intricate parts perfectly fit into each other, all moving harmoniously to perform some specific work, the onlooker is apt to recognize only the man whose skill has brought together these various parts, little dreaming of the poor molder, and especially the obscure patternmaker, whose brain-racking task played, after all, the most important part in the drama.

When will we poor fellows, who daily puzzle our heads over blue prints and bewildering numbers, in order to convert lines and figures into tangible, workable forms, be suitably recognized and our work receive its due meed of praise? We have been ignored so long that some of us are really hankering after a little recognition. When shall we receive our rightful heritage?-The Woodworker.

## A CHIPPENDALE DINING ROOM <br> FROM THE CABINET MAKER-ENGLISH

## THE TREATMENT OF A COMMON-PLACE INTERIOR.

In using the expression "a common-place" room, we mean to convey the idea of an apartment which has no distinctive features which lend it any interest apart from the furniture and decoration. In such an interior as this the furnisher and decorator is necessarily handicapped. If he has a deep angle or an imposing bay he has the main points of a successful scheme ready to hand, but in the majority of cases in which our readers are called in to give advice the room proves to be an essentially common-place one, and, as often as not, takes a form such as that shown on the small

plan at the bottom left-hand corner of Figure 3, a regular rectangular space, with the exception of a chimneybreast, which projects some few inches into the room, and a shallow bay window. There are, of course, thousands of persons who are thoroughly satisfied with this arrangement, and who ask for nothing better, but there are also artistic clients who require a distinctive scheme or fitments which shall give individuality to their daily surroundings. Fitments as ordinarily constructed are very expensive for the man of moderate means, but an attempt has been made in the accompanying sketches to design a fitted room on the simplest possible lines. In order that the dimensions of the bay window may not be further contracted, no elaborate draperies have been used, but simple casement curtains are employed, treated with embroidery in harmony with the general color scheme.

Having thus dealt with the only feature of the room which lends itself to decorative treatment, we must decide as to the handling of the other three walls. The one opposite the bay window does not adapt itself to any fitment scheme, because it is on that side that the room is entered. The designer, therefore, devotes himself to the fire-place side of the room, and that opposite it. At the outset let us draw attention to the number of horizontal lines introduced; this principle of horizontality is one which should never be forgotten, as it adds greatly to the homely appearance of the
interior. As a concession to science and hygiene, we have made our rooms higher, and it remains for the artist to contrive a scheme which shall prevent the box-like impression, such as is given by a room of undue height. The proper height at which to fix the intermediate cornice, enriched with the applied fret, is determined by the transom between the upper and lower lights of the window, and if this rule is followed the curtains, and frieze form a continuous band round the upper part of the walls of the room. It is surprising, considering how floor space is contracted in flats and small houses, that furniture designed to stand in corners is not more used, as the amount of room gained in this way is enormous. In many instances the corner of a room is occupied by a jardiniere or some useless ornament, whereas a needful piece of furniture might be placed in it, the customary over-crowding so apparent in small apartments being thereby avoided. This is a course which has been adopted in the scheme under consideration, and, we think our readers will agree, with success. Roomy corner cupboards are placed at $\cdot \mathrm{A}$ and B . The details of capping, frieze and necking moulding are identical with those of the intermediate cornice already referred to, and the height of the corner cabinets is also governed by the line of the same feature and the mouldings intersect each other. The same remarks apply to the glazed hanging cupboard in the center of the wall, and when the latter is further connected with the corner cupboards by the horizontal lines of the shelves, we have the wall clothed with an inexpensive yet very

effective fitment. The sideboard is small, being more like the sidetables, so dear to the hearts of eighteenth century designers. It may be argued that this arrangement does not give enough accommodation, but the corner cupboards should supply all requirements in this direction; one of them might with advantage be
fitted with a cellarette. Note the triangular brackets in the Chinese taste which support the shelving; these little additions, small as they are, add very much to the character of the whole. These frets are repeated in the angles formed between the legs and drawers of the side-board. It will be seen from the plan of the fitment on this page that both the shelves and hanging cupboard only project very slightly from the wall. The shelves arranged for books in the recesses on either side of the fireplace call for no explanation here, but we might warn readers against the mistake which is often made of using stuff which is too slight for shelves of considerable width, as the weight of the books causes them to sag in the center, the consequent effect being very unsightly


Lack of space gives little opportunity for a description of appropriate decoration, but many treatments might be suggested. The woodwork, of course, is in mahogany, and a color scheme which would look well would be a wall filling of plain green, the frieze having either a cream ground with pale green stencilled decoration or a buff ground and rather darker green enrichment. If a figured paper were employed, the frieze should be left plain and tinted cream color

## BLUNDERS IN CONSTRUCTION

## By OWEN B. MAGINNIS

The continuance of accidents, collapses, and disasters seem to be a feature of building operation indespensible to their progress, and, as many are caused by error, haste or poor judgment, it is the intention of this article to draw attention to some of the hitherto unnoted causes.

In axiomatic form the following are the most to be deprecated:

Before commencing to excavate, or while excavation is in progress, neglecting to make full borings or test-holes to locate quicksand or water pockets into which workmen are liable to sink or disappear.

Fitting and hanging doors to stairway or elevator wells before the stairs or elevators have been placed, and leaving the doors unfastened or unlocked. This is criminal negligence.

Varying the heights of stair risers, causing accidents and falls, and in not providing good, safe treads for the workmen, or iron stairs or fire escapes. This is as risky as omitting to cover every second tier of floor beams, and should be deemed a violation of law.

Insufficient and loose widths of plank scaffolds and runways on uncovered floors. This is a frequent cause of accident.

Neglecting to provide guard rails and printed warning signs around hod-hoist openings, hatchways, etc.

The flagrant and criminal offense of ordering removed or causing to be too soon removed the centering, cribwork or other false-work supporting terra-cotta or concrete arches. The recent collapse in the new apartment house in East 87th street, New York City, was due to this cause. Four lives were lost by the untoward haste, and the foreman was justly held for manslaughter.

Neglecting to properly and thoroughly brace framed posts and walls, cast or wrought iron columns, freshly laid brick walls, window and door frames, etc., with proper timber joists or beams to prevent straining or injury from sudden impact, jar, wind pressure or the like. This bracing should be thorough to preserve the details plumb and level until the whole work has set.

Overloading the floors or floor-beams by accumulations of brick, steel, wood beams, mortar, terra-cotta blocks, and similar heavy materials, concentrating too much weight on any particular spot. Equal distribution over large areas should be insisted upon This oversight has caused many casualties, both in the demolition and erection of buildings.

Inefficient shoring, needling or bracing in altering or underpinning buildings, and unskilled workmanship in connection with the same are also to be deplored.

The omission of caissons, dams, cofferdams and sheet pilings, especially in deep excavations or in unreliable compositions of soils. It is taking big chances to assume that even the hardest strata are free from pockets of quicksand, quiescent or spring water. Many accidents and fatalities have resulted from bad judgement in this regard, as in some cases they have developed suddenly.

Not draining the site. This neglect jeopardizes the future safety of a building by keeping the soil moist, rotting and injuring the mortar and materials, by frost and thaws, compelling constant and expensive pumping and hindering the use of the space for working men and materials. If possible, all cellars and sites should be drained by connecting with pipes to street sewers or cesspools.

Building on frozen ground which has been waterSOAKED. This blunder, unfortunately too frequently made, has been the cause of many walls and buildings falling, causing cracks, bulges and collapses.

The recent enactment of Employers' Liability Laws in various states must perforce compel builders and contractors to supervise their work with greater care and strictness than heretofore and will undoubtedly have a good effect on both mechanics and laborers, as they cannot recover damages on account of accidents caused by their own blunders or oversights. The following is an excerpt from New York State's Law, recently put in force:

Chapter 674.-Workmen's compensation in dangerous employments.

Section 1. Chapter * * * thirty-one of the Consolidated Laws is hereby amended by inserting therein a new article, to be article fourteen-a thereof, to read as follows:

Section 215. This article shall apply only to workmen engaged in manual or mechanical labor in the following employments, each of which is hereby determined to be especially dangerous, in which from the nature, conditions or means of prosecution of the work therein, extraordinary risks to the life and limb of workmen engaged therein are inherent, necessary or substantially unavoidable, and as to each of which employments it is deemed necessary to establish a new system of compensation for accidents to workmen.

1. The erection or demolition of any bridge or building in which there is, or in which the plans and specifications require, iron or steel frame-work.
2. The operation of elevators, elevating machines or derricks or hoisting apparatus used within or on the outside of any bridge or building for the conveying of materials in connection with the erection or demolition of such bridge or building.
3. Work on scaffolds of any kind elevated 20 feet or more above the ground, water, or floor beneath in the erection, construction, painting, alteration or repair of buildings, bridges or structures.
4. Construction, operation, alteration or repair of wires, cables, switchboards or apparatus charged with electric currents.
5. All work necessitating dangerous proximity to gunpowder, blasting powder, dynamite or any other explosives, where the same are used as instrumentalities of the industry.
6. The operation on steam railroads of locomotives, engines, trains, motors or cars propelled by gravity or steam, electricity or other mechanical power, or the construction or repair of steam railroad tracks and roadbeds over which such locomotives, engines, trains, motors or cars are operated.
7. The construction of tunnels and subways.
8. All work carried on under compressed air.

Sec. 216. The words, "employer," "workman" and "employment," or their plurals, used in this article, shall be construed to apply to all the employments above described.


## GEOMETRICAL STAIRS

## By F. T. HODGSON

Figure 161 shows a plan of a type of geometrical stairs with curtail steps, wreaths about wells, quarter-space landing and winders.

Figures 15 to 32 give all the necessary drawings for such a staircase.

The string wreaths are constructed by making a center upon which the portion of string to form the wreath, which has already set out and sunk, is bent and temporarily fixed, face to the center, to which upright staves with radiating joints are fitted and rubbed with glue, and on the unseen internal face of which canvas is glued to increase the rigidity and tenacity.

This when set is released from the center and is cut to the set out marks and tongued to the grooved string as shown in Figure 23. The straight as well as the curved portions of the string are then secured together by pieces of stuff arranged on the gib and cotter principle.

Figure 21 shows such a joint; the screws lettered are those which are fixed after the wedges have been driven home.

Figure 23 gives the plan showing all the necessary lines to set out a curtail step; the block is made in three thicknesses, glued together with the grain at an angle of about $45^{\circ}$ to each adjoining piece, to prevent any tendency to split.

The contour of the curtail follows the outline of the scroll, both being set out from the same centers, which in this case are obtained by first drawing a right angled triangle, the perpendicular sides being one inch and $11 / 4$ inches, the other points being obtained by drawing similar triangles, as shown in Figure 23.

Figures 17 to 19 give the plan and elevation, showing the junction of risers, treads, string and straight balusters of the outer cut string. The lower ends of the iron balusters are sometimes forged and screwed to the string, which has a block to strengthen it and receive the screws at that part. The thin ornamental bracket is planted on the string mitred with the riser and covering the baluster end.

## handrailing.

The contour of the handrails in dog-legged stairs follows the line of the string, being ramped, mitred, and fixed to newel caps by double-nutted screws, as shown in Figure 7, or tenoned to newels, as shown in Figure 5.

The handrails for open newel stairs are usually straight, and are tenoned and dowelled to newels, the heads of the latter usually being turned. Where handrails are used on the wall side they may be ramped, as shown in Figure 8.

A ramp with a vertical scroll is shown in Figure 24. In geometrical stairs the handrails should be constructed to present a graceful appearance, which effect is best obtained at a minimum cost by setting out the handrails and stairs on the tangent system.

> necessary drawings.

The following drawings are necessary for the production of a rail on the tangent system:
(1) The plan with center line of handrail and tangents, as shown in Figure 25.
(2) The development of the tangents, as shown in Figure 26.
(3) The development of the vertical plane containing center line of handrail, and the face of the string. These are usually in one and the same vertical plan, as shown in Figure $2 \%$.
(4) The face mould, as shown in Figure 28.
(5) The bevels, as shown in Figure 29.

## tangent system.

A suggested plan of the stairs is made showing center lines as 7 km , Figure 25. Tangents, such as $h i$, ikl, lm, are then drawn in plan. The elevations of these tangents are to be determined, and may be arranged in a number of ways; and there will be one set of tangents better than any other, which will satisfy the following conditions:
(1st). The best position of the tangents when developed is that showing them as being tangential to the development of the center line hkl, Figure 25 and will occur when the goings on the straight and about the well are equal.
(2d) The next best position is obtained when the upper tangents, as $t^{\prime} m^{\prime}$ ' Figure 26 are not interrupted, but produced ungents, as $t m$, Figure the second quarter of the plan of the tangents is reached, as at $r^{\prime}$ Figure 26, and the lower tangent $r^{\prime} h$,' Figure 26 (the upper
and lower tangents being the center lines of the upper and lower straight handrails), is stopped at $x$, a point about 12 inches from the springing line measured on the pitch, and the intermediate tangent is shown in elevation by a line drawn from this point to the point $l^{\prime}$ of the upper tangent.

To obtain the appearance of the rail it is best to develop and determine the plane section of the rail made by an imaginary vertical plane containing the center line of the handrail; and by doing this any defect or cripple in the curve is more readily detected.

Figure $2 \%$ shows the development of the vertical lines, $h, h, i, i$, etc., containing the points rhi2k34mt, the stretch out of $h m$ being without any great error $h m$, obtained by drawing lines $120^{\circ}$ to the line joining springing points $h m$ till it cut a line tangent with the center point $k$ of the curve, the adjoining part outside of the wreath being the same as the corresponding lines in the development of tangents shown in figure 26; and the pornts in the development of the curve being determined by drawing ordinates as $s-I$ in figure 25 and from the elevation of $s^{\prime}$ draw $s-p$ equal to $s-I$ is a line on the plane containing hik, and parallel to ih, therefore, s being known, $I^{\prime}$ is determined as shown in figure 26, and in a like manner any convenient number of heights of points can be obtained, and by projecting these heights on corresponding developed vertical lines of the center plane of handrail, the exact developed positions of points in the center line of the handrail may be obtained. Circles are then struck about these points, as shown in figure 27 , which are points in the center of the rail. A continuous curved line is then drawn tangent to the small circles, which if pleasing in form should be approved.

The curve of the rail determines the position of the nosing, which should then be drawn, and from which the lines for the setting out of the string is obtained.

Figure 28 shows the method of setting out the face mould for the lower half of wreath, which is the true shape of a section made by a plane containing the center line of half of the wreath and tangents.

The line marked level line is that part at which the rail may be imagined to commence twisting in the-opposite direction.

Figure 29 shows the method of obtaining the bevels at $h$, which is the dihedral angle between the oblique plan containing the tangents $h i, i k$, and a vertical plane containing the lower tangent $h i$. The bevel at $k$, is the dihedral angle between the oblique plane containing both tangents and a vertical plan containing the upper tangent $i k$.

Figures 25 to 29 show the application of the principles to the half-turn landing of the geometrical stairs shown in figures 15 to 22.

The method of setting out rail on the dressed plank is shown in figure 30 ; and of sliding the duplicated moulds to get the twist is shown in figure 31; and the view of the finished portion of wreath is shown in figure 32 .

Fast European Express Trains.-Express speeds in Great Britain and on the Continent are high. In Great Britain there are eleven daily express trains making runs of from 50 to $1183 / 8$ miles without a stop, whose average speed is from 51 to 59.2 miles per hour. The fastest and longest non-stop run is $2253 / 4$ miles, from Paddington to Plymouth, made at 54.8 miles per hour. France has seven daily expresses that run from $773 / 4$ to $1471 / 2$ miles without stop at speeds of from 51.1 to 61.8 miles per hour, and there are nine French trains that run from 102 to $1473 / 4$ miles without stop at speeds of from 50.4 to 59.3 miles an hour.

Strength of Wood After Long Service.-Evidence that structural timber, if properly protected, does not deteriorate in ordinary service is afforded by some white pine beams, which formed the chords for a timber bridge during eighteen years of service, the bridge being covered during fourteen of these years. Tests of the timber showed an average elastic limit of 3,966 pounds, and a modulus of rupture of 5,208 pounds per square inch. According to W. K. Hatt, of Purdue University, who records these facts in Engineering News, white pine beams of large size are credited with an average modulus of rupture of 5,000 pounds per square inch.

## PLANNING A PRIVATE GARAGE*

By HERBERT L. TOWLE

The Problems Involved in the Design and Construction of One's Own Housing for His Car. Suggested Arrangements, Plans and Exterior Treatment Based on What Has Been Done.

Unless one has already owned and operated a motor car, the planning of the first garage is likely to present a number of problems previously unsuspected. How large should the garage be to house comfortably the car and the necessary equipment? What items should the equipment include? What is the practical value of a pit? Is a turn-table worth its cost? Should the garage be heated, and, if so, by what system? Are any special considerations necessary in arrangement of windows? How should the floor be drained? What materials of construction are most suitable, and under what conditions is a portable garage economical?

Before proceeding to answer these and similar questions, let us consider the question of location. One of the elemental things to remember about a garage is that a car must be run in front foremost, and backed out, unless a turn-table or skids are provided for turning it around. The driveway outside is usually wider than the door, and the consequences of bad steering are not so great where the former is concerned.

If the garage is built on a small plot; it is usually best to locate it near the road, with a straight driveway. This latter will need no explanation to one who has tried to follow a serpentine driveway backward on a moonless night, with only the glimmer from the tail lamp to guide him. A driveway is usually an unsightly thing, but an automobile driveway may have its bareness alleviated by eschewing the usual cinders or crushed stones, and laying two cement wheel tracks, about $21 / 2$ feet wide, between which grass or flowers may be planted. Of course the tracks must be straight, as otherwise one could not follow them backward, but even then they are less unsightly than a ten-foot S -shaped cinder drive, such as a mistaken idea of beauty sometimes perpetrates in what are, otherwise, harmonious surroundings.

If the garage is some distance from the road, it is advisable to provide means for turning the car around, and on a large place this can be done without noticeable disfigurement. The simplest arrangement is a Y, for a one-car garage, or a gravel court in front of the garage where three or more cars are housed.

Coming now to the requirements of the garage itself, we find that these are determined in large measure by the conditions under which the car is to be used. If the owner lives in a fairly large town, it is not likely that he will wish to do important overhauling on his own premises. Minor work, however, such as tinkering with ignition and carbureter, replacing brake shoes, and miscellaneous work on attachments and fittings, are usually handled with greater convenience and economy on one's own premises. If, on
*Reprinted, by permission from "Motor," April, 1911.
the other hand, the location is a country seat, and if*the car is in constant service, it may be advisable to equip for handling all but the most strenuous jobs, without having to send the car to a distant shop.

If a car is to be used regularly in freezing weather, the garage must be heated, and the means for doing this must have careful consideration, because of the danger of fire, if ordinary open stoves are used.

The equipment may range from a bench, soldering outfit and a few scattering bench tools, up to complete facilities for making new parts, and for repainting. In a large garage, housing several cars, one may find not only pit and turn-table, but forge, lathe, shaper, drill press, chain hoist and trolley for taking the motor and transmission, an arbor press and wheel puller for replacing gears, and a separate dustless room for repainting bodies. The heater will probably be found in the basement, reached by outside stairs; and overhead, reached by a staircase not communicating with either storage room or shop, will be found the chauffeur's quarters. In a small garage the cars must, perforce, be washed where they stand, or outside, if the weather permits; but in the large garage an incoming car may be washed on a turn-table directly inside the door, and sent thence to its proper stall, or to the shop in the rear for looking over.

Before deciding, therefore, on the size and arrangement of the garage, one must settle on the usage which the car is to receive, and the proportion of repair work which is to be done at home. The writer classes among legitimate home repairs all minor tire work, all except the most difficult soldering jobs, and in general everything that can be handled with bench tools and a drill. The making of special parts, however, usually requires a lathe or other machine tools, and the amateur does not know how to use these. Such tools, therefore, should be provided only when an experienced chauffeur is to be employed. An emery wheel, however, driven by foot power or by a small electric motor, is essential and a bench drill press run by hand power is almost equally so. Other useful equipment comprises an anvil, vise, assorted drills, taps and dies, a heavy hammer, hack saw, portable vulcanizer, breast drill frame, assorted files, kerosene torch and soldering outfit. For working under the car a low trundle is useful, although seat cushions will serve. An oil tank, underground fuel tank and pump, hose connection for washing, and lockers for tools and clothing are among the things most commonly needed. If repainting is to be done at home, the two-car garage must have a separate body storage room, to avoid dust settling on the newly painted surfaces. In the one-car garage, however, this is not essential, though side space for staging the body is convenient, both in repainting and in overhauling transmission and rear axle. If floor space is lacking, the body may be drawn back a trifle and propped up above the chassis, thus needing but little additional room.
(To Be Continued.)


GArage at "OVErview," Villa nova, pa., BaILey \& BASSETt, ARCHitects.


The owners of the garages shown are: $1-\mathrm{Mr}$. John Phillip, Glenridge, N. J. 2-Mr. Neal Rauboue, Beverly Farms, Mass. 3-Mrs. M. C. Post, Englewood, N. J. Don Barber, Architect. 4-Mr. James McCrea, Ardmore, Pa. Bailey \& Basset, Architects. 5-Helen C. Chase, Waterbury, Conn. E. F. Benedict, architect. 6-H. P. Benson, Salem, Mass. $7-\mathrm{Mr}$. William Blodgett, Chestnut Hill, Mass. 8-Mrs. Irene D. Overy, Oak Lane, Pa. C. E. Schermerhorn, architect. $9-\mathrm{Mr}$. E. Hamlin, Marion, Mass.


RALPHFWINDOES:
(Continued from April.)

PLATE X.
Line shading.
In finely finished drawings for exhibition work, catalogues, advertisements, etc., it is often desirable to make the various parts stand out more clearly on the paper. This is especially true of curved surfaces. The effect is obtained by drawing a series of parallel or converging lines on the surface at varying distances from each other. These lines are farther apart on the lighter portion of the surface, and closer together and heavier on the darker part.

Figure A shows a cylinder shaded in this manner, Figure B

If the student has trouble with the plate it is advisable that he redraw it until good results are obtained, as in this, as in other things, perseverance has its reward, and no draftsman can call himself competent unless he is capable of good line shading.

## PLATE XI.

PENETRATIONS OR INTERSECTIONS OF SOLIDS,
It frequently occurs in the drawing of details, that one solid is made to intersect, or penetrate, another. There is a line formed at the point of intersection and it is the delineation of this line that will now demand our attention.

!
a hollow cylinder and Figure C a cone. To avoid a large blot at the apex of the cone, each line should be allowed to dry before drawing in another.

Figure D gives us the sphere and it will be noticed that nearly all of the lines on the shaded side are put in the same as shade lines.

Figdre E represents the conventional shading of a round, flat surface.

Figure F is given as an example of the use of line shading and it offers excellent practice in the joining of straight lines with curved lines. The curves should be drawn first.

Figure G shows the side elevation of a hexagonal prism, viewed across the flats, and Figure H a square prism viewed across the corners.

In Figure A we have a theoretical fitting for a steam or water pipe. The plan and the elevation are shown. Both parts of the fitting are the same size. To find the line of penetration, proceed as follows:

On the horizontal center line, and a little to the left of the side elevation, construct the semi-circle whose center is o. Divide onehalf of it into three equal parts, locating points $1,2,3,4$. Project these points up to the horizontal center line of the plan and over to the vertical center line of the elevation. At the intersection of the horizontal center line of the plan with the vertical center line of the semi-circle, place the compass point and draw the arcs as shown. Project these over until they intersect the outside circle of the plan, and locate points $5,6,7,8$. Project these downward
until they meet the horizontals projected over from the semi-circle. This locates points $9,10,11,12$. Through these points draw a line, which is the line of intersection of two cylinders the same diameter and cutting each other at a right angle. The line a-b is easily located from the above.

In Figure B we have the intersection of two cylinders at right angles but of different diameters. The line of intersection, which in this case is curved, is found in exactly the same manner as the one in Figure A.

It will be remembered then, that if the cylinders are the same size, the line is straight, if of different sizes the line is curved, and that the line of intersection is always found in this way no matter what the size of the cylinders is, or the angle of penetration.

Figure C gives us the plan and elevation of two prisms, of different sizes, which intersect at right angles. It is a very simple problem and no difficulty should be experienced in solving it. Point 2 is the projection of point 1 on the center line of the side elevation. Point 3 is the same with point 4. By connecting these with $a$ and $b$, the angle of penetration is found. In a manner similar to this nearly every intersection of prisms may be found, no matter what angle of penetration is used.

Figures D, E and F represent the finished elevations of the examples without the construction lines. They afford an excellent opportunity to apply the principles learned from Plate X. They should be drawn about half the size of the elevation above them.
(To be continued.)


## AN EXTRA HAZARDOUS RISK

During the convention of Building Material Supply men, recently held in Chicago, a credit man in quite an extensive talk on credit is quoted as saying, "that the carpenter-contractor should be generally classed as an 'extra hazardous risk.'"

He further stated that the supply man was the contractors' banker, meaning of course, that it was he who supplied the goods or money on long credit which enabled many contractors to do business.

We would understand from this that a consideration is paid to the supply man for this kind act, as he could not himself afford to carry the account on his books for an extended period, which is a risk, unless he got more money for his goods. This may explain why many contractors do not make money, and are always hard up.

It is difficult, we know, to get a banker to advance money on a building contract to a contractor without means, or at least some good collateral; but if it can be done, the contractor will find he is money ahead, and the interest a bank would charge is less by far than the advance price the supply man asks for his goods on an extended credit. Then too, the contractor is foot-loose to shop around to get the best prices for his materials.

To Imitate Old Oak.-To make an exceedingly rich color for the imitation of old oak, the ground is a composition of stone ochre or orange chrome and burnt sienna; the graining color is burnt umber or Vandyke brown, to darken it a little. Observe that the above colors must be used whether the imitation is in oil or distemper. When dry varnish.

Painting on Brickwork.-If you have a wall of brickwork, and the bricks are very soft, then broom down clean and apply a size of acid water, just enough muriatic acid to sour the water. Let this be rinsed off with clear water, let it dry, then apply all the raw oil the wall will take. This is for a first-class job, and the oil will prevent the chipping of the brick afterwards. The oil makes the soft bricks harder, and also waterproof. Hard bricks will not need so much oil. Where the wall has been filled with raw oil the first coat of paint should be of good quality, and according to what the finish is to be; if to be painted like wood, it should be thinned with oil and turpentine until the last coat, which should be done with all oil. But if a dead brick finish, then use all turpentine color, for the finish, though the priming may be all oil, and the next coat or two, half and half, as the dead effect is surer on a partly lustrous ground, or on a perfectly full luster.

be seen from the library.
The One Story House-This style is popular in California, and can be adapted to other sections

## THE ONE STORY HOUSE

## By L. BAURY

While the low rambling one-story type of house is still peculiarly a product of the Pacific Coast architecture, visitors from other parts of this country who have been charmed by this arrangement of rooms that lends itself so appropriately to requirements of life in a warm climate, are adopting this plan of building for their country homes on the mountains, or at the seashore. Even the patio, which was formerly exclusively Californian, now appears not only in some of the newest Southern houses, but even in the summer homes of many northerners of artistic taste. Unsuitable

as such a house might be for city, or even suburban use, all the year round, nothing more attractive could be designed for those who wish to combine the delights of home with the freedom of life out-of-doors.

In such a house the rooms are usually arranged upon the single-floor level. In the case here illustrated, there is a lounging room in the tower. The house is invariably built around the patio,
with its garden in the center, and, in which, if desired, a fountain may also be introduced. It is this room that is really the living room of the house, for, covered by a skylight, the interior, while assuming all the aspects of a delightful garden spot is amply protected against any inclemency of weather. In many houses of this character vines are among the plants placed in the center of this apartment, and they are trained to cover the walls and extend completely around the room.

As may be seen by the plans, nearly every room in this house opens upon the patio, the dining room and reception hall being separated from it by glass partitions. In this way the brightness and attractiveness of the patio extends to other parts of the house -bringing a sense of proximity to Nature, with which people of the north and east have long been unacquainted in their homes.

The front of the house is made attractive by a partially enclosed porch and a pergola. The porch opens into a large reception hall from which there are doors to the library and parlor, or living room. Here a large open fireplace, built into the outside chimney, furnishes an artistic touch that is most attractive. The arrangement of the bedrooms in this plan, with the conveniently placed baths, and numerous closets, cannot fail to commend itself to those who are looking for comfort as well as economy of space. The arrangement of the service wing, which shuts the kitchen with the pantry and servants' rooms, completely off from the rest of the house, is a feature that, while typically Californian, might well be duplicated in houses in other parts of the United States.

All the rooms are of good size, have plenty of windows, and, of course, hardwood floors throughout. While the house is not designed especially for year round occupancy, it is provided with a furnace from which heat may be obtained during the few weeks in the year when the ordinary summer home becomes too cold for comfortable habitation. At the same time, there is no reason why such a plan should not be adopted by those desiring to build a permanent home, providing the lot is large enough to accommodate a structure that requires so much land.

The house which the accompanying photographs show is built of stucco and is covered with a red-tile roof. The tower extends to a height of about fifteen feet from the roof-level, and is also covered with red tile. It is reached by a stairway which leads from the reception hall, and this is regarded by the owners as one of the most attractive features of this house.

The detail cost of this building is as follows:

| Masonry, cement work and plastering. $\$ 1,025.00$ |  |
| :---: | :---: |
| Lumber | 1,100.00 |
| Doors and sashe | 250.00 |
| Hardwood floors | 210.00 |
| Skylight for patio | 150.00 |
| Carpentering work | 640.00 |
| Tile roof | 450.00 |
| Plumbing | 500.00 |
| Hardware | 100.00 |
| Furnace | 125.00 |
| Electric wiring | 50.00 |
| Painting | 300.00 |
| Total | 0.0 |

## THE BUILDER AND THE AUTO

THE auto, not so much the big touring automobile for pleasure and for show, but the auto truck and light delivery wagon is going to be a factor in the affairs of the up-to-date builder in the next few years and it is a subject enterprising builders should be taking up. The man that gets into the game first may pay some extra price for having to carry on experiments, but he will get the extra advertising and reputation for enterprise that will give him prestige in the community, so it is worth while sometimes for a man to indulge in a new automobile to ride around in for pleasure is simply to create adverse criticism, but for a man to get an auto wagon of a type fitted to his own work instead of his regular horse and spring wagon is to show a kind of enterprise that will be appreciated. Already in some localities these are being
seen and soon it will be builders, plumbers, tinners, and all kinds of trades people who need wagons operating motor wagons of some kind or other.

The automobile people are giving special attention now to the commercial side of the business. That is, to the making of commercial cars, trucks, and lighter vehicles and it is worth while for every builder to give the subject attention, too. They should prove both a convenience and a step in progress. They need not cost much more primarily than a good horse and wagon and no more to operate, and they should be less trouble. So, make inquiries and get literature on the subject and keep up with the times in connection with commercial auto wagons and see if you can be a sort of leader of this progressive movement in your community.

# FIGHTING THE HOUSE FLY 

By WM, C. A. STEVENSON

We are now face to face with another season of fighting the house fly. The several Boards of Health have been warning the people of the deadly disease germs carried by the fly from the garbage barrels, etc., into the house and onto the food stuffs.

It is therefore up to the householder to see that his house is properly protected from the invasion of the fly. In order to do this successfully, the screens must be properly fitted; the doors should have good heavy spring hinges on them, so as to throw them shut as soon as a person passes in or out. The door should always spring outward, for this reason: The flies light on the wire on the outside and if the door swings in when it is opened, they leave the door into the house. This is one of the bad features in double swing doors, as sometimes used on store doors, etc.

But when the door swings outward and the flies are on the wire, when the door is opened, the motion of the door scares them away and they do not return before the door has closed if good hinges are used to throw the door promptly shut.

Window screens should be the full size of the window and made to fit in place of the storm sash, if the storm sash are hung with patent hooks, these will also do for the screens. When the screen is made to fit the full size of the window, either sash can be opened at will and you still have screens in the window. A screen that only raises the lower sash up part way and sets under it is about as good as no screen at all. To prove this fact, I will draw attention to the illustrations herewith shown. (A) shows a section of the sash of a window when closed, Br the bottom rail of the lower sash Mr the meetings of the upper and lower sash, Tr the top rail of the top sash.
(B) shows the lower sash raised up part way with a screen set under it: note the space between the meeting rail of the upper sash, allowing the flies to light on the glass and crawl up and over the top of the lower sash as indicated by the arrow points. Carpenters, it is up to you to point out this defect in this narrow screen to your customers, and show them the necessity of having window screens made full size.


## HOTEL McALPIN



USHING rapidly ahead, work is now under way on the Hotel McAlpin, to be the largest hotel in the world, and to stand at Thirty-fourth street and Broadway, now admittedly the heart of New York City.

The Greely Square Hotel Company, the owners, are promised by the builders, that the giant new structure will be completed within a year, and the present plans are to open it in Setpember, 1912.

Fortunately New York has a solid rock foundation and once the fundamental excavation is ready her great buildings grow up like mushrooms. The new hotel gets its name from the McAlpin estate which owns the ground on which it will stand, the 30,000 foot block fronting Broadway on the east between Thirty-third and Thirty-fourth streets. It will stand twenty-five stories tall including the pent house on the top which will shelter the machinery.

The plans, to quote the architect, Mr. F. M. Andrews, are as follows:
"We are erecting a structure twenty-five stories in height, with a close adherence to the style of the Italian Renaissance in architecture. There will be 1620 guest rooms, 1100 bath rooms, and some two hundred large and small rooms devoted to the use of guests and servants. The dimensions will be 202 feet on Broadway, or the entire western face of the block, running east of Thirty-fourth street 150 feet, and the same distance on Thirty-third street. The material is Bedford stone for the base, and the main shaft of the design in golden brown brick, while the upper portion of the design is to be carried out in this brick and colored terra-cotta. Such are the plans that to every bedroom light and air will have free access, and every room will have its bath or en suite to be connected with a bathroom, and more space is to be allowed to rooms than to any new hotel of large size built in New York for a great many years.
"Taking the various notable public rooms there is first the lobby, the largest of its kind in the world. Its height is fifty feet and its width is 64 x 96 in length. It is designed in the Italian

Renaissance, executed in Paonozza marble and a polychrome terracotta that in the model has elicited high praise from the best critics. At the mezzanine floor level will be balconies overlooking the lobby. The entrances will be on Thirty-fourth street, Thirty-third street and Broadway.
"The banquet hall is to have a vaulted ceiling of unsually ornate effect and the length of the room, 80 feet, with the high arch and the extreme narrowness 32 feet, all go to make it very unique and impressive. This room fronts on Broadway and is matched on the south by the ladies' tea room and restaurant, 30 by 65 feet with a ladies' reception room 30 by 30 adjoining, while on to the east is the general writing room and library 30 by 45 feet. To those familiar with the dimensions of similar rooms in American hotels it will be apparent that the public cannot fail to appreciate such generosity in costly space. All of these rooms will be decorated in the style of the North Italian Renaissance with the exception of the ladies' reception rooms which will be carried out in Louis XVI style.

On the second floor are some unusual features, for instance a lounging room for men 65 by 96 feet, and here will be the private dining rooms very handsomely executed. The nearer the guests' table is to the chefs' range the better the service, the hotter and more appetizing the food. This is a truism among hotel men. The kitchen of the McAlpin will not only be the largest in New York. City, but it is located immediately under the dining rooms and waiters and trays ascend and descend by escalators, reducing transition time to a minimum.

In order that the right idea of the great size of the Hotel McAlpin may be properly conveyed, permit me to quote some of the startling figures in the specifications. The area of the plot is thirtythousand square feet, the estimated cost over all is about $\$ 14,000$,000 , the private telephone exchange is the largest ever built, being thirty by 120 feet: there are seven miles of heating risers, mains and returns, and one hundred and fifteen miles of electric lighting wires. The tubing in the hotel will be three and one-fourth miles in length.

## A METHOD OF SETTING OUT A CURVE

To set out a curve in a road, footpath or curb gracefully is no easy task. The accompanying drawings illustrate a simple instrument by which a curve of any radius from 10 ft . to 60 ft . can be set out which will not have the irregular effect too often seen. It is based on the platelayer's method of setting out a curve without a theodolite, by offsets from equal chords.

The instrument is constructed similar to a tee-square, and shown complete in Fig. 1: A is an oak lath, $5 / 8$ in. thick, 3 in. wide, and 7 ft .4 in . long; at one end is fitted the cross-piece B, of oak, $5 / 8$ in. thick, 3 in . wide and 3 ft . long. The two pieces are halved and fixed together with screws, and must be perfectly square. Over the arm B is placed the slider D, with pointer and notch for an ordinary $1 / 4$-in. diameter chain arrow. The slider is a band of sheet brass, $\frac{1}{16}$ in. thick, $11 / 2 \mathrm{in}$. wide, and bent to slide over the arm, and should be a good fit. On the face of the band is soldered a strip of sheet brass 3 in . wide and $1 / 8 \mathrm{in}$. thick, the edge on the inside projecting $1 / 2 \mathrm{in}$. beyond the edge of the arm. A square opening, $1 / 2 \mathrm{in}$. wide, is cut in the center of the brass plate, exposing the scale, and at the middle of this opening is soldered a pointer. The notch E for the chain arrow is cut with a $1 / 4-\mathrm{in}$. diameter round file; the center of the notch must be perfectly in line with the pointer, and cut to a depth to allow the arrow to bear against the edge of the cross-arm B. On the outer edge of the slider is soldered a strip of brass $3 / 4$ in. wide, 1 in . long, and $1 / 4 \mathrm{in}$. thick, and at the center of this strip is drilled and tapped a hole for a $1 / 4-\mathrm{in}$. clamping screw. This screw is to fix the slider when set for laying out a curve of given radius. On the face of the cross-arm is a scale C , divided into inches and decimals of an inch. The scale is either painted direct on the arm, or on paper pasted on and varnished. The scale is adjusted so that when the slider is close against the long arm, the chain arrow against the long and cross-arm in the angle G, the zero of the scale is immediately under the pointer. A brass plate F , $1 / 8$ in. thick, $11 / 2 \mathrm{in}$. wide, and $31 / 2 \mathrm{in}$. long, is fixed with screws on the long arm; the center line of the plate must be exactly 3 ft ., and $1 / 4 \mathrm{in}$. from the inner edge of the cross-arm. On the center line of the brass plate a slot, $1 / 4 \mathrm{in}$. wide, is cut with a $1 / 4-\mathrm{in}$. round file. The slot is cut to the edge of the long arm, to allow a chain arrow to rest against the edge of the arm. Great care must be taken that the slots are cut to the dimensions, for on this the accuracy of the instrument depends.


Before the instrument can be set to lay out a curve, the radius of the curve to be laid out will have to be found by the rule: $\mathrm{C}^{2}$ $-+v$, where $C$ equals the half of the chord and $v$ the versed v
sine, or the height of the curve, at the center of the chord.
Fig. 2 will explain the method of finding this data in actual work, H E being an assumed curve to be laid out. Stretch a line from $E$ to $H$, the commencement of the two ends of the curve; measure this length, the half of which will be C in the rule. From the center of $H \mathrm{E}$, measure to the point L , the highest point of the curve; this height will be v , or versed sine in the rule.

Assuming H E to be 40 ft . long, and the length V L 10 ft ., $20^{2}$
the radius of the curve will be $\frac{20^{2}}{10}+10=50 \mathrm{ft}$. The radius of the curve being known, the half-length of the offset from the tangent will be necessary, which is found by the rule $R-\sqrt{R^{2}-L^{2}}$, where $R$ is the radius of the curve, and $L$ the length of the tangent,
or the length of the arm of the instrument from F to G in Fig. 1. The half-length of the offset for a radius of 50 ft . by this rule will be: $600-\sqrt{600^{2}}-36^{2}=1.08 \mathrm{in}$. In the working of this rule, all dimensions are reduced either to feet or inches; in the example they are reduced to inches.

The following table of offset lengths is for a 3-ft. tangent, for radii from 10 ft . to 50 ft ., calculated by this rule from which an extended chart, giving intermediate radii can be set out on squared paper, thus avoiding calculating offset lengths each time a curve is set out.

| Radius | Half Length <br> of Offset | Full Length |
| :---: | :---: | :---: |
| ft. | in. | in. |
| 10 | 5.53 | 11.06 |
| 15 | 3.64 | 7.28 |
| 20 | 2.44 | 4.88 |
| 25 | 2.17 | 4.34 |
| 30 | 1.8 | 3.60 |
| 35 | 1.55 | 3.10 |
| 40 | 1.35 | 2.7 |
| 45 | 1.20 | 2.4 |
| 50 | 1.08 | 2.16 |

The most convenient chart would be the half-length offset, and for the full length it is simpler to double the values in the chart.

The length of the first offset, P N in Fig. 2, where the curve starts from the straight line, is the length found by the rule, and is half the length of the succeeding offset R Q .


To set out a curve, an arrow is driven in at the start of the curve at E, and another at M, 3 ft . back on the straight line. The slider on the cross-arm is set with the pointer over the half-length of the offset, corresponding to the radius of the curve. For instance, taking the radius as 50 ft ., the pointer is set at 1.08 in . from the edge of the long arm, but if the radius of the curve to be laid out is 10 ft ., the pointer is set at 5.53 in . The inside edge of the rod is placed against the outside of the arrow at M , with the arrow E in the slot of the brass plate F (Fig. 1) ; the arrow must bear tight against the edge of the instrument. A third arrow is now driven through the slot in the slider of the cross-arm; this arrow will be the first point on the curve at P in Fig. 2. The next step is to alter the length of the offset to its full length, which for a $50-\mathrm{ft}$. radius curve is shown in the table to be 2.16 in ., and for a $10-\mathrm{ft}$. radius 11.06 in . In the next position of the instrument, its edge rests against the outside of the arrow E and the arrow P in the slot F of the instrument. An arrow is inserted in the slot of the slider, which will be the second point, R , of the curve. Proceeding in this way, a series of arrows is driven in until the opposite straight line is met. The arrows being only a little over 3 ft . apart, the curve can easily be completed between the arrows without deviating much from the correct curve. In using the instrument, care must be taken that its edge be tight against the arrows, and the arrow at the cross-arm driven in with its edge touching the cross-arm in the slot of the slider. Instruments for setting out curves of larger radius are constructed by increasing the length of the arm between $G$ and. $F$ (Fig. 1) and the other parts proportionately, a table of lengths of offsets being calculated to suit the increased length of arm.-L'Ingenieur in Building World.


# ANSWERS 

From Old Reader, Toledo, Ohio.
Replying to H. H. Hoel, Roanoke, Va.
In estimating excavating, a great deal depends on the nature of the soil, both for the unit cost of excavating and for the amount which will have to be taken out. Earth, sand and gravel can be taken out for 25 to 35 cents per yard, clay 30 to 50 , while rock will sometimes run to two or three dollars a yard.

A compact soil, such as rock or clay, can be excavated close to the required size, while loose soils will cave in, requiring sheetpiling or extra excavating.

For ordinary work, where the depth is not too great, assuming the excavation to be two feet larger all around will take care of the extra work about the excavation. Thus, for a building 30 x 50 x 10 feet deep would be $34 \times 54 \times 10=18,360$ cubic feet or 680 yards. For average soil with some clay, at 40 cents per yard $=\$ 2 \% 2.00$. This provides for carting only a short distance, any additional cartage to be extra.

In estimating brick work, a wall is always a certain number of brick thick, three brick making a little over twelve inches thick, and called a twelve of thirteen inch wall, according to locality. One of the best methods is to reduce everything to square feet one brick thick and then multiply by the number of brick to the surface foot. This varies from 6 to 8 , according to the size of the brick and the method of laying, width of joints, etc., but $61 / 2$ or 7 is about the average. Thus a wall for a building 30x50x19 feet high and three brick or 12 inches thick would be $30+50+30+50$ $=160 \times 19 \times 3 \times 7=63,840$ brick.

Weatherboarding is usually sold by the square foot, th: unit measurement being the amount required to cover one squaro foot. Tlas for the above building would be $160 \times 19=3,04$ s, feet to cover. By specifying "to cover 3,040 square feet" the lumberman will know exactly what is required. For flooring, the amount requirad would be to cover $30 \times 50=1,500$ square feet. As the widt'l of flooring varies, it is usually sold by the "board foot," so that a 6 -inch board only covers $51 / 4$ inches and the 6 inch mus' we paid for. It is therefore necessary to add one-seventh for this width of flooring, so we would have $1,500+214=1,714$ feet board measure. In like manner $21 / 4$-inch face would require onethird to be added. A little should also be added to make up for cutting and matching and waste, and while this sometimes will run as high as ten per cent, the average will be less than five.

## circular form.

From Subscriber, Pittsburg, Pa.
In reply to W. H. Parsons, Miltonvale, Kans.
In building forms for circular work, one of the best methods is to cut templets or centers out of any old pieces of wood or plank, nailing them together to form the approximate curve, and then sawing out as closely as possible to the exact curve. Then take strips of galvanized iron as wide as the height of the step and tack to the face of two of the centers, one for the top and one for the bottom. This will give a good smooth surface for the cement to finish against. The back of the step may be finished the same way, but as much care is not needed where the work will not be exposed when finished.

The concrete should be put in rather wet, and carefully trowelled or spaded against the iron so as to remove any stones from the finished surface. As soon as the concrete is set, and before it is too dry the front form should be removed and the surface trowelled and floated off to a smooth finish. When the work is put in in the morning it is sometimes necessary to finish the work the same evening, although it will usually be all ready the next morning. This is a good method to use for putting in curbing where the corners are curved to a rather small radius.

From C. A. M., New York, N. Y.
Replying to F. X. Laliberts, Southbridge, Mass.
Every manufacturer of refrigerators has his own ideas on the construction of his work. A box about the size mentioned was recently built with walls and top made according to drawing "A." It is to be noted that there are ten thicknesses of paper and $41 / 8$ thicknesses of wood, besides the mineral, and with regard to mineral wool, the directions of the manufacturers must be followed and care used not to compress the wool too much, or the fibers will be broken and the wool will mat down, leaving an undesirable air space at the top. Neither should it be allowed to get wet after being filled iv place, as that also has a tendency to mat it down.


The writer believes cork to be a much better insulator, used as shown in "B." Care must also be taken that all air spaces are divided up into small blocks not over 12 inches squäre by $1 \times 2$ strips. This prevents a circulation of air, which will greatly decrease the insulating qualities. The paper used should be that made especially for insulating.

## SKEW Back.

From C. O. P., Fort Barrancas, Fla.
On page 43 of your March number a bricklayer asks for a formula to find inclination of the skew back for a simple arch when span and rise are given. The following formula gives the exact face or horizontal drop-back for an arch 12 inches deep, for any span and any rise.
$\mathrm{x}=$ face in inches (see diagram)
$\mathrm{s}=$ half span in inches.
$\mathrm{h}=$ rise in inches. 24 sh
$\mathrm{x}=\frac{}{\mathrm{s}^{2}+\mathrm{h}^{2}}$ or in other words multiply the product of the
rise and half span by 24 and divide the result by the sum of the squares of the rise and the half span.


In the example given of 6 inches rise and 24 inches half span, the face is 52-3 inches.

From E. A. G., Phoenix, Ariz.
In your March issue the question was asked by a brick-layer, how to find a bevel, when rise and run was given-"no time for paper and pencil." The mason always has a two-foot rule in his pocket, and a mason's level at hand. I am a carpenter, but had I been in his place, my solutions would have been as below: Using a rule for obtaining $6^{\prime \prime}$ rise, as per drawing; a level for a straight edge, with a square end, and the "eye sight" producing the dotted

lines which appear on this paper. The brick, of course, can be stood on end with the same results. These are not for the draftsman, with his geometry, but are for the "occasion" no paper or pencil, and no geometry, that he realizes.

## QUESTIONS

## DORMER EYEBROW.

From M. C. K., Ridgefield, Conn.
Could you, through The National Builder, give me a working sketch of an eyebrow dormer?

What I would like is to be told the way to construct it to get it perfect in shape. The roof is to be shingled and the ridge of dormer is to be level.

## LUMBER SYMBOLS.

H. A. B., Cleveland, Ohio.

Will you kindly inform me what the following expressions in lumber signify:

18,803', $8^{\prime \prime} 1$ VV Siding.
$12 / 10 ; 30 / 12 ; 53 / 14 ; 301 / 16 ; 687 / 18 ; 490 / 20$.
Also this expression: SISIE?

## mission settee.

From H. Schrott, St. Louis, Mo.
Will some reader be kind enough to give me full particulars of how to make and finish a Mission settee, in the future numbers of "Our Paper"; also, how to solder copper, and oblige a subscriber?

HOW TO CONSTRUCT A FLAT ROOF.
From John N., Rochester, N. Y.
I would like particulars of the proper method or methods of constructing a flat roof for a building $32 \times 48$ feet on the plan? Any information on the subject will be gratefully accepted.

## steel squares.

From "Young Framer," Seattle, Wash.
I would like to hear from my fellow readers, their opinion regarding best make of steel squares? I have an old square, which I bought along with other old tools from the widow of one of the first settlers in this country. The square has stamped on it, "Eagle Square" and seems true and in good order, but has not the figures on it that I have seen on some of the squares East. Does anyone know of this make of tools, and is it reliable for general use? Any information on the "square" and the manner of using it, will be appreciated very much.

## inlaying table.

From R. M. A., Asbury Park, N. J.
Thinking possibly some reader would give me a little information on a task which I am about to begin, I am writing you in regard to where you think is the best place to purchase material?

I belong to the Local Lodge of Knights of the Golden Eagle, and wish to make a table inlaying an eagle, using a variety of woods, or if you could give me a better idea about the same, to bring out the natural color of the eagle as near as possible, or would you think it best to make the eagle of one piece of wood, using some curly wood in preference. My idea was to make the legs and rails of the table of quartered oak, the table to be about 5 ft . long
and about 30 in . high, and to lay an under top on the same principle as a double flooring in houses, so as to prevent the under top from shrinking and drawing the inlays apart. The reason I think this way is best is I have made two tables with inlaid tops, using white pine bats tongue grove 6 in ., and as they spread through, possibly by laying the double flooring the under one on the diagonal would prevent the top from shrinking, which, of course, draws the inlays apart.

In regard to size of eagle, I borrowed a design from a friend on black and white, which is about $111 / 2 \mathrm{in}$. wide spread, and $51 / 2$ in. high. I thought it would be about the right size in accordance with the size of table.

I received a catalog from Johnson's Wood Dye Trim, which gives some very good border ideas, and I think I can find one to harmonize with the design. My idea is, also, to get as much variety of wood as possible, as I intend to inlay the bottom shelf; the table will be on the order of a library table.

If possible, would like to inlay the letters K. G. E., used in the eagle design, and also the swords if you think it possible.

If you could recommend me as to where I could purchase a variety of woods thoroughly dry for inlaying, would be greatly obliged to you. They need not be over 2 or 3 in . wide and a foot or so long, and $1 / 4 \mathrm{in}$. thick-such scraps as one would find in a good cabinet shop, etc.?

My idea for inlaying, or at least the way I made the other tables was by cutting most of the inlays in a mitre box and inlaying with a good oaking glue.

Would thank you very much for any suggestions you could offer me. Am going to try and complete same by next December, 1911, if possible, and if it turns out successful, will send you a photo of same for your valuable paper, The National Builder.

## BUILDING REFRIGERATORS.

From F. X. L., Southbridge, Mass.
I should like to gain information on the building of refrigerators, for instance, say one about $14 \times 18 \mathrm{ft}$., and about 7 ft . high ?

## DIVIDING GIVEN ANGLES.

From W. G. L., New Haven, Conn.
I should like to know the most accurate and easiest way of dividing a given angle into a given number of parts as 3 or 5 , etc., all equal?

## HIP RAFTERS.

From H. C., Mansfield, Mass.
I would like to ask questions on rafters. Now, I have a hip roof house. I can frame all the rafters and get all cuts, but I cannot get the joint on the hip rafter to come right with the common rafter. Would like someone to give me some idea?

## estimating by the cubic foot.

From J. L. K., Staples, Minn.
In the July, 1910, number of The National Builder, page 46, you gave an answer to question No. 317, in regard to cubic foot estimating. Am $I$ to understand that in that way of estimating all material is finished, even to cellar walls and the painting of the structure ; if so, how many coats of paint. The answer also states that "These figures are from basement floor to ridge." That I take to include cellar and all the foundation. Am I right?

## NOTES ON CONSTRUCTION

## By WARFIELD WEBB

There are a large number of fires directly due to poor construction, and not, as some are inclined to believe, inadequate fire-proofing building materials. Taken as a general class, burned clay commodities are fireproof materials. The value of these materials naturally vary to a greater or lesser degree, but when we take them as a class, they are far superior to any other class of structural materials.

On the other hand the inferior quality of a building material will often do much to increase its inability to withstand any considerable amount of heat, and will make the structure, of which it if a part, more dangerous on this account. For this single reason, among many others, the manufacturers should endeavor to make their commodities superior in so far as actual quality is concerned. Even an ordinary clay brick is a good fire resister, when it has been properly manufactured. It can withstand a considerable fire
without being materially affected, the only requirement being that it be made with care and burned in like manner.

Good materials in the hands of poor or careless builders will so far deteriorate their actual value as structural materials from almost any point, that their relative value in this respect is reduced a hundred per cent. While this is true, it is also true that moderately fair materials in the hands of expert worimen can be made far more valuable, even surpassing in merit the better qualities when in the hands of the former class. This is a fact that should not be overlooked by all classes, both manufacturers, architects, and contractors. Each one is vitally interested in not only having the best possible clay products obtainable, but there is equally as much concern as to the ability of the men who undertake to construct the buildings with the various clay building materials.

Despite the ever-increasing number and kinds of structural materials, brick, and kindred clay building materials, have not only kept abreast of the increase, but have actually greatly increased in demand. There has been a reason for this, and one of the most notable causes in this respect has been the fact that there are so many clay commodities possessing more than ordinary qualities to withstand fire. Under this head comes fireproofing, as a leader, then terra cotta, flue linings, firebrick, vitrified brick and common brick. These are a few of the many specials, manufactured from clay. The list will not only compare favorably with any list of other structural materials, but will actually surpass it.

The public appreciate the simple fact that there has been hundreds of years service in clay building materials, and that they have withstood the most severe tests, which time alone can engrave on the durability of such commodities. In all these years there has been an upward tendency, and a striving for a higher quality, and a forward march toward the goal of fire resistance and durability under all trying tests. Had burned clay commodities not been able to withstand these time tests, had they been found failing in the crucial trials that the public has demanded, then today we would see a notable retrogression, and not the onward march that has been so noteworthy in the past few years.

How to increase this voluntary approbation should be the highest and foremost aim of the manufacturers of all kinds of clay commodities. They should be encouraged to fight for higher quality, for more enduring materials, for better quality in all that they essay to do. If their equipment is not of the best, and their help of the kind that is a drawback to their more notable achievements, then they should root out these cankers, and start afresh to gain new laurels for themselves and their industry.

The increasing call for fireproof structural materials should act as an incentive to spur them on to higher things. They must understand that while the construction work itself is too often a factor that is detrimental to the cause of the proper development of the fireproof demand, that they should not on this account, become lax in their efforts to improve the conditions that will make for a more trustworthy product from their own plants.

## EXAMPLES OF BRICKWORK



## NEW BOOKS RECEIVED

(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.)
The Law of Contract. Vol. I.-By Alexander Haring, C. E., LL. B., LL. M. Member of The American Society of Civil Engineers; Professor of Bridges and Railway Engineering, New York University; Member of the American Society of Engineering Contractors; Attorney and Counselor at Law.
Bound in Buckram-hard covers. Over 518 pp. Published by The Myron C. Clark Publishing Co., Chicago, Ill.

This will certainly prove a useful work for engineers and engineering students and in fact for all contractors in every line of business. The idea of the work seems to be the presentation in a condensed form, a text of the law of contracts in every form and to give the general theory of the subject as taught in the law schools-while yet evading the reading of endless cases, and as the author states, to give the student an understanding of the subject, sufficient to guide him in meeting the legal phases of whatever branch of engineering he may be engaged in.

The Law of Contract, as presented to the majority of engineering schools at the present time, consists of half a dozen lectures, delivered by an attorney, who aside from these lectures does no further lecturing or teaching. The result is what might be expected, the engineering student graduates with practically no knowledge of the subject. This text is intended for use as a recitation course, which may be supplemented by occasional lectures given by experienced professors of engineering. But, where such advantages are not available, a student may get a fair knowledge from this volume where precedents and the letter of the law are fairly set forth. Indeed, building contractors as well as
engineering contractors will find in this work abundant material to set them right in case of doubt, as to the legality of any contract they may have in hand. No building contractor's office can be fully equipped without a copy of this book on its shelves.

Metal Work and Etching.-By John D. Adams. A complete handbook for art metal workers, giving every detail for making a great variety of useful and ornamental objects, such as book ends, desk sets, arts and crafts jewelry, hinges, drawer pulls, paper knives, letter openers, match boxes, tie and pipe racks, pad corners, etc.-fully illustrated; 96 pp . Well bound in cloth. Size, $5 \times 7$. Price, post paid 25 cents. Published by Popular Mechanics Co., Chicago.
This is one of the series of hand books on Industrial subjects that this company is publishing from time to time and which is proving a great success among amateur and other workers in wood, leather, brass, copper and other metals. We have reason to believe that the sale of these work manuals is very large and meets with considerable favor by all people, of both sexes, who practice amateur work in any of its forms. The authors of these books are mostly practical men who have a The authors of these books are mostly practical men who have a knack of conveying to their readers their ideas in the simplest and plain every day language. It is this quality that makes these manuals so popular.

The William T. Comstock Company of New York City, publishers of The Architects' and Builders' Magazine, announce that the name of the journal will be, after the present issue, Architecture and Building. This is the original name of the magazine when first established in the early 80 's, and which did good service for the Architectural and Building world. We congratulate the publishers on the change of name, and hope adequate success, in every respect, may follow.

## BUILDING TRADES INTERESTS IN THE COURTS

Technical violations of a building contract, which the contractor corrects on his attention being called thereto, are not "breaches," within the contractor's bond requiring notice to the surety of breaches of the building contract.-Lazelle v. Empire State Surety Co., 109 P. (Wash.) 195

The mechanic's lien statute does not authorize a personal judgment against a wife for the price of material furnished to her husband under a contract with him and used by him in improving her prop-erty.-Robert Garrett Lumber Co. v. Loftus, 109 P. (Kans.) 179

Where a wrecking contract provided that plaintiff was to remove a certain building "at once," and others at specified times, the words "at once" meant within such time as was reasonable under the attending circumstances.-Wetter v. Kleinert, 123 N. Y. S. 755.

The surety on the bond of a building contractor, providing for notice to the surety of breaches of the contract by the builder, may not complain of failure to give notice of breaches occasioning no loss to the owner: the surety showing no injury from the omission. loss to the owner; the surety showing no injury from the

A contract to furnish materials for a building on leased property was sufficiently performed when the materials were furnished and put into the building, though the premises were not owned by the person contracting for the erection of the building.-Chelmsford Foundry Co. v. Shepard, 92 N. E. (Mass.) 75.

A building contract having provided that, in case the owner should be compelled to take charge of the building and finish the contract, the necessity for which was to be determined by a certificate of the architects, the cost of completion should be audited and certified by the architects, and such audit and certificate should be conclusive on the parties, the certificate of cost is admissible against the surety on the contractor's bond to prove the damages to the the surety on the contractors from the contractor's breach.-Lazelle v. Empire State Surety Co., 109 P. (Wash.) 195.

Where work is stopped on plans of an architect before they are completed, generally speaking, he is entitled to pay for services rendered, but it is otherwise when a condition of his original employ ment is that the plans shall be for a house not to cost more than a certain sum, and the change in plans is made upon the same condi tion, and an agreement to pay for extra work caused by the change is with the understanding that the plans, when completed, are to provide for a house costing not to exceed the sum as originally con-templated.-Hullmuth v. Benoist, 129 S. W. (Mo.) 257

The mechanic's lien law (section 6244, Gen. St. 1909 [Code Civ Proc. Sec. 6491), allowing a lien on a married woman's real estate for material furnished to her husband under a contract with him and used by him to improve such property, does not violate the mandate of the Constitution (article 15, Sec. 6) that married women shall be protected in acquiring and possessing property separate and apart from their husbands, or conflict with the married women's act (section 4872 , Gen. St. 1909), providing that the separate estate of a married woman shall not be subject to the disposal of her husband or liable for his debts.-Robert Garrett Lumber Co. v. Loftus, 109 P. (Kans.) for
179.

In a consolidated action by a contractor for the balance due on building contract, and against the contractor because of the collapse of the structures, a charge that if the jury find that the contractor was to construct the structures under certain plans and specifications, and upon completion the structures gave way and became unfit for the use they were intended, then the contractor would be liable, etc., was properly refused, as incomplete, for failure to state that the giving way of the structure was due to failure to comply with the plans and specifications, and failure to state that the owners were free from fault.-J. W. Bishop Co. v. Curran \& Burton, 76 A . (R. I.) . 275 .

In an action on a wrecking contract, a contention by defendant at the contractor was personal, and that plaintiff broke the contract hat selling the building materials to other parties, who were to wreck y selidings and remove the materials, was untenable, since th the buildings work was not necessarily the contract by plaintiff, his agreement with being no assignment of the contract by plaintir, the parties to whom he sold the building material simply made them subcontractors in the work of wrecking, and the contract between plaintiff and defendant still remained, for the enforcement of the rights and duties of each other.-Wetter v. Kleinert, 123 N. Y. S. 755.

Defendant, S., after having conducted a store for some year inder the style of S. \& Co., had it incorporated in February, 1898, as under $S$. Company, of which he became president and secretary, and which the firm property was transferred. The corporation decided o wrect a new building on the premises which it leased, and at th orchitect the plaintiff submitted to him a proposal to equest of its architect the plain building "all as per blue print sub urnish certain material ${ }^{\text {S }}$ " At defendant's request plaintiff' mitted for building for Mr . S . At defendant's request, plaintiff agent had an interview with defendant and the architect, at which plaintiff's agent consented to reduce the price for the material, which was noted on the written proposal, which was before the parties, and they made an oral agreement by which the plaintiff was to furnish the material required for the building and as called for by the archi tect's plans, etc. Plaintiff's agent did not then know that the defendant's business had been incorporated, and defendant made no mention thereof in their interview, but acted throughout as if contracting for himself individually; but the evidence showed that, so far as lefendant had any intention, he intended to contract for the corpora-
 tion. Held, that if defelieving as a reasonable man that defendant that he was justified in believing as a reasonable man that defendant contracted for himself, and not as agent for the corporation, defendant
will be bound personally by the contract, and under the circumstances
he was so bound.-Chelmsford Foundry Co. v. Shepard, 92 Nv E. (Mass.) 75.

There can be no valid judgment of foreclosure of a materialman's lien for material furnished to a contractor upon the real estate improved with such material, in the absence of a valid judgment in favor of the materialman against the contractor for the price of such material. In a suit for the foreclosure of such a lien, where no personal judgment is sought, and the petition fails to allege that the plaintiff has a judgment against the contractor, and where the contractor is not a party to the foreclosure suit, it is erroneous to refuse to dismiss the petition on general demurrer.-Baldwin $\mathbf{v}$. Shields, 67 S. E. (Ga.) 798

A provision in a construction contract, providing for the allowance of additional time for completion in the event of delays from certain causes, but that no extension should be made unless a claim was presented in writing at the time of the delay, when the owner's superintendent should certify the additional time to be allowed, but permit the contractor to appeal from such award to arbitrators selected as provided, was not contrary to good morals or public policy, even if it made the owner's superintendent the final judge as to the time allowed as extensions, his award being binding if not made through fraud, mistake, or made arbitrarily.-Thompson v. St. Charles County, 126 S. W. (Mo.) 1044.

## PATENTS

The following list of recent patents and trademarks relating to building interests
is especially reported for The National Buthder
of Amerly reported for W American and foreign patents and tra demarks, Norris building, 501 F street, by him for 25 cents.

978,588 . Shutter manipulator and fastener. J. W. Huntley, assignor to R. T. Marsh, Rockhill, S. C.

978,781: Window-glass setting gauge. E. S. Rhoads, Kansas City, Mo.

978,654 . Floor surfacing and polishing machine. Peter Sass, San Francisco, Cal

979,285 . Reinforced concrete construction. John Gilligan, Nebraska City, Neb.

978,908. Excavating apparatus. Wm. J. Leary, assignor to W. J.
Leary Manufacturing Company, Jersey City, N. J.
979,910 . Shutter operating and fastening device. Chas. W. Adams, Putney, Vt.

## 979,913 . Building-block. J. M. Ault, Decatur, Ind

80,031 Sash-cord pulley. H. G. Boight, assignor to Russell \& Erwin Mfg. Co., New Britain, Conn.

979,614. Floor-surfacing machine. Wm. E. Warner, Houston Tex

983,115 . Floor and ceiling plate. A. J. Beaton, assor. The Beaton \& Bradley Co., New Britain, Conn. 983,046 . Interior mold or form for concrete structures. F. S. Graef, New York City.

983,011 . Locking device for emergency exit doors. H. G. Boight,
assor. Russell \& Erwin Mfg. Co., New Britain, Conn
982,916 . Comb-cover for corrugated roofs. Wm. E. Williams and
K. Roth, Terre Haute, Ind.

983,474 . Transom lift. E. E. Bell, assor. Concealed Transom Lift Co., Glen Ridge, N. J.

983,681. Hollow fireproof partition sliding door for fire-walls R. W. E. Buttlar, Columbus, Ohio.

984,132. Device for cutting slits in brick walls. H. Geyer, Munich, Germany.

984,216. Framing for concrete and cement constructions. W Henderson, Cleveland, Ohio

984,034. Cellar-door construction. H. C. Seipp, Coraopolis, Pa 984,993 . Mold for forming concrete silos. C. A. Anderson, St
Charles, Ill. Floor scraper S. Drew, Rochester, N. Y
988,277 . Reversible window. Wm. H. Meizel and J. L., York,
Nebr.
987,819 . Building block. Wm. H. Osburn, Kokomo, Ind
988,326. Metal reinforcement for building purposes. H. Ferree
San Francisco, Cal.
989,328 . Tiling fo roofs. DeWitt W. Buchanant, Chicago, Ill 989,344 . Building block. E. J. Forbes, Revere, Mass. 989,016. Fireproof building floor construction. E. V. Johnson
Chicago, Ill
989,219 . Hinge construction for doors. R. G. Winter, Milwau-
kee, Wis.
989,830 . Reinforced concrete construction. Fred A. Berne, Bir
mingham, Ala
990,029 . Fire escape. A. H. Borden, New Bedford, Mass.
989,564 . Artificial stone building block. J. Buhler, Zurich, Switz erland.

990,119. Building block. P. D. Diamond, assor. Diamond Concrete Mchy. Co., Chicago, Ill

990,151 . Metal door. Robt. D. Mayo, Grand Rapids, Mich
989,646. Combined door hanger. A. E. Rupp, Chicago, Ill.
990,437 . Concrete block mold. J. Hartley, Gobleville, Mich.
990,358 . Emergency exit-door lock. P. W. Hodgkinson, assor,
Caldwell Mfg. Co., Rochester, N. Y
990,750 . Device for locking the doors of emergency exits. O.
Kublanck, Wittenberge, near Potsdam, Germany. . . Schlisske 990,299 . Reinforce
sterlagke, No. 85 Hanover, Germany

## TRADE REVIEW

HOT WATER HEATING.
Not so very long ago, the
 coming of winter meant bringing out the old "base burner" from the woodshed to occupy the greater part of the parlor. Possibly a similar process took place in the dining room. Night and morning meant carrying coal and ashes through the house. But not even a "turkey wing duster" will clean up all the muss on the carpet nor will the zinc sheet prevent a hot coal burning a hole in the carpet and rug. In many homes every morning meant starting up grate fires in one or more rooms with the attendant labor of chopping up wood, etc., for of chopping up wold months.

The introduction of hot water heating was a great step forward toward proper heating of homes. From the discomfort of a local heat from a fireplace (a great part of which went up the chimney) there was the location of radiators under the windows, where the greatest cold came in. Instead of a draft from the window to the fireplace there was the gentle diffusion of heat throughout the room. In place of having a stove in the center of the room taking up the best part of the room, the radiator occupies only a small space in the most unobtrusive manner. In stead of lugging coal up from the basement or outside shed, the coal is piled within easy reach of the heater. Instead of one or two rooms unduly heated and the rest icy cold, the whole house is now evenly heated. In fact so many are the advantages of hot water heating that one who is accustomed to it cannot appreciate the discomforts of the early methods of heating.


Ready to Ship.
Anticipating the demand for hot water heating for residences, the Andrews Heating Company of Minneapolis, perfected a system by which they could supply complete heating plants in such shape that they could be sent to the job and erected by such labor as was available. Suitable erection plans are sent and all the piping cut to the proper lengths in such a way that no cutting and threading pipe on the job is necessary. A boiler of their own manufacture is used, which the Andrews Company claim is more economical, requires less care and is easier to clean. The directions which they send are so complete that there is little chance to go wrong in the installation. It is only necessary for the prospective purch in to send a sketch, showing the sizes of the rooms, doors, windows, height of ceilings and general construction and their engineers will prepare an estimate showing the cost of the entire plant at your prepare an estimate showing the cost of the entire plant at your station, including Boiler Fitting, Piping, Radiator, Expansion Tanks, Regulating Safety Valve, Packing, Bronze
everything necessary to complete the job.

On account of the peculiar nature of a heating plant, it is frequently impossible to tell if a plant is satisfactory until it is up against cold weather. A very little heat may suffice for an ordinary spring day when there is only a chill in the air, but a real fire is necessary when it is down to zero and a blizzard raging outside. To provide for this, the Andrews Company give every customer a 360-day Free Trial Guarantee Bond, which allows the trial through the entire winter.

Closely allied to the heating system are the systems for plumbing, water supply and sewage disposal. The Andrews Company design systems for this purpose on practically the same basis as outlined for the heating. As it is more than likely that the Andrews Company can direct the prospective purchaser to a home near him where their systems are in use, they wish everyone contemplating building or putting in any of the systems mentioned above would write for their 72-page book, describing the various systems in much more detail than can be given in these columns. This book is sent free by the Andrews Heating Company, 1188 Heating Building, Minneapolis, Minn.

FIVE MILLION PULLMAN SASH BALANCES SOLD.
The Pullman Mfg. Company, Roch-
 ester, N. Y., have made and sold, and there are in use today, over $5,000,000$ of their Automatic Sash Balances.

This goes to show that the old fashioned cord and weight for windows is doomed. The Automatic Spring Sash Balance has every advantage over cord and weight, for it is self-contained, neat in appearance and requires no pockets or box frames as cords and weights do. The Pullman Sash Balance is so constructed that the tension of a spring exactly balances the weights of the sash. The window may be raised and lowered with the greatest facility. The lowered with the greatest facility. The no more tendency to raise and fall of its own accord than with cord and weight.
own accord than with cord and weight.
Pullman Sash Balances cost practically the same to install as cords and weights. They are very much more durable, for the bronze tape which supports the weight of the sash is practically indestructible, and everyone knows how long steel clock springs last.

The Pullman Mfg. Company inform us that notwithstanding the fact that there are now over $5,000,000$ of their Balances in use, and that most of the repairs must come from them, the total new tapes supplied do not amount to 100 a year, and most of these new tapes are called for when some careless person in setting a sash or removing one, has accidentally put a kink in the tape.

Architects and builders who hesitated to use the Pullman Sash Balance when it was first put on the market because of a feeling that it might not prove durable, have long since discarded this idea, for experience has shown that no other item of builders' hardware has more lasting qualities than the Pullman Sash Balance.

## BUILDERS' HARDWARE.

The National Manufacturing Co., Sterling, Ill., have just issued their 1911 catalogue of Builders' Hardware. Since issuing their last catalogue they have completed and occupied a large addition to their plant. The floor space now covers some $100,000 \mathrm{sq}$. ft., or approximately two and a half acres.

While making a complete line of regular builders' hardware, the attention of the contractors and builders are centered on their barn door hangers and fittings, sliding door hangers, and special ventilating sash locks, all of which display remarkable ingenuity and are particularly adapted to their purpose.

Contractors and builders will find much more of interest in the catalogue than is indicated above, and we are advised that a copy will be sent on request.

THE WEBER WAX POLISHER AND SANDER
There is great demand for a small wax polisher and sander, if it is handy and effective.

Knowing this, Mr. John F. Weber, who has made almost a life study of contractors' needs, has perfected a polisher on an entirely new principle.


It is composed of three castings, three screws and a handle. The weight is separate and, when a thumb screw is loosened, the sandpaper block can be set at any angle. This gives as many different scraping surgives as many different scraping surfaces as there are angles, and nearly
doubles the life of the sandpaper. doubles the life of the sandpaper.
When the sandpaper does become When the sandpaper does become
worn out, a new sheet can be set in worn out, a new sheet can be set in place in an instant.
When used as a wax polisher, a tough bristle brush of best quality fits into the place of the sandpaper block. The polisher is then ready for use. Special care has been taken to provide a weight just heavy enough to impart a fine finish without being hard to transport.

Both the sandpaper block and the brush fit into a clamping arrangement in such a way as to bring them flat and even on the floor. This care has resulted in producing a true "lineless" finish all floor. This car

Besides using this polisher themselves, contractors find a ready sale for them. After finishing up a house, it is a simple matter to sell one to the owner, because its utter simplicity and handinesswith its superior work-speaks for itself.

Contractors are asked to write to Weber Mfg. Co., 661 71st Ave., West Allis, Wis., for complete particulars and prices on this polisher and on a number of other modern money-saving devices, including the famous Weber Double Acting Floor Scraper.

## CAPT. JOHN SMITH.

A short narrative on the life of this distinguished traveler, whose romantic adventures are more or less traditionary. On the grounds that the statements of manufacturers are true, the biographer bespeaks consideration for his Smith story.

It is a readable piece of history and should appeal to every member of the Smith family, as well as historians, and incidentally the users of Carborundum. The booklet is sent free on application to the Carborundum Co., Niagara Falls, N. Y.

## The NORTHWESTERN TERRA COTTA COMPANY

Manufacturers of High Grade

## Architectural Terra Cotta

Enameled Work a Specialty
Main Office and Works, 2525 Clybourn Ave. Branch Office, Room 1415 Railway Exchange CHICAGO, ILLINOIS

## HESS Satinary LOCKER

The Only Modern, Sanitary
 STEEL Medicine Cabinet
or locker, finished in snow-white, baked everlasting enamel, inside and out. Beautiful beveled trimming. Steel orglass shelves. Costs Less Than Wood Never warps, shrinks, nor swells. Dust and vermin proof, easily
cleaned. Should Be in Every Bath Room The Recessed Steel $\begin{gathered}\text { Pour styles-four sizes. To recess in } \\ \text { wall or to hang outside. }\end{gathered}$ Medicine Cabinet Send for illustrated circular
HESS, 907 L Tacoma Bidg., CHIGAGO Makers of Steel Furnaces.



for Carpenters are made with just the same superiority in respect to accuracy, workmanship, design and finish as Star rett Tools for Machinists. And that's saying a good deal. Complete Catalogue No. 18-M sent fre

THE L. S. STARRETT CO., Athol, Mass., U. S. A.


143 Cities
USED
"Stonekote"
ROUCH CAST
in 1910
The A. W. True Residence, Hinsdale, II.
Before you build or repair the old home have your architect write us for book telling of "Stonekote" Portland Exterior. What color would you like a sample to be: Gray, Silver Gray, White, Buff, Red, Brown.

## THE GARDEN CITY SAND COMPANY manufacturers <br> 709-11 Chamber of Commerce, CHICAGO, ILL.



## A COMPLETE MACHINE SHOP EMBODIED IN ONE MACHINE.

As in every other business competition among carpenters and builders is often keen, and the "little fellows" are often at their wit's end to figure out some scheme whereby they can bid on equal terms with their rivals and stand a better show of capturing the contract. After all it is only a matter of lessening the costs of production, and any proposition proving a means to this end should be thoroughly investigated.


But how to cut the costs! Various ways and means may be sug. gested, but the mostsprominent is that of cheaper millwork. Local planing mills can charge high prices and get away with it; you can not save anything in that direction. Clearly the only thing to do is to install your own planing mill; in other words, operate your own machine shop. This can be done by installing just one machine.


You may argue: "What's the good of one machine when I have a dozen different kinds of work to perform? Is it possible to use orie machine as a band-saw, as a joiner, as a planer, as a mortiser and tenoner, as a sander, etc., etc.? I cannot afford to buy separate 'machines; furthermore, I have not sufficient floor space to install them or men to operate them."


Our answer to this argument would be to refer them to the No. 14 Famous Universal Woodworker, made by the Sidney Tool Co., of Sidney, Ohio, which does sixteen different kinds of work, each of which is performed by making a few simple adjustments. That car-
penters and builders have been quick to realize the possibilities offered by this machine is proven by the fact that six hundred have been sold during the past two years, and that it is satisfactory is demonstrated by their all being in use today; not one has ever been returned or reported unsatisfactory.

The principle of constructing one machine to take the place of several is not new, but only one firm (the above named) have perfected it to the extent that it actually displaces over a dozen, without deteriorating from the quality of work to which the trade have become accustomed. Each of the various kinds of work can be performed as good, as quick and as clean on the Famous woodworker as on a machine built to do just one thing.

The No. 14 comprises the following sixteen machines: $27-\mathrm{in}$. Band Saw; 12 -in. Joiner; Saw Table (with raising and lowering arbor); Single Spindle Shaper; Boring Attachment (arranged on special boring spindle); Pony Planer; Tongue and Pole Rounder; Hollow Chisel; Mortiser; Single End Tenoner; Drum Sander; Disc Sander; Knife Grinder; Emery Grinder; Band-Resaw; Spoke Tenoner; Rim Borer and Wheel Equalizer; Adjustable Felloe Rounder.

Consider the advantages of this method. Consider that you are doing your own millwork in your own shop, free from the delays and high charges of planing mills, putting their profits in your own pocket, and cutting down production costs that much. And remempocket, and cutting down production costs that much. And remember there are no machines lying idle, practically no extra floor space required, no high-priced labor to pay, as anyone can operate the
Famous. The Sidney Tool Co. will gladly send their catalogue, prices and terms upon request. Further information is given in their advertisement in this number.

## WATROUS "SAFETY" SASH HANGERS.

The E. L. Watrous Mfg. Co. of Des Moines, Iowa, are offering to the trade the new No. 18 Safety Sash Hanger, as shown in the accompanying illustration. The makers claim for it the following
 points of superiority.

1. Always works perfectly. Impossible to set it wrong.
2. Quicker and easier to set, saves labor and money for carpenter and householder
3. Will not blow off or be dropped by children or careless servants. The projecting guard will not let the sash come off till it is pushed out about half arm's length, where a little lift and pull unhooks it easily.

This hanger is packed with barbed car nails is packed with Nine carpenters out of ten drive the screws on these jobs with hammer anyway, and a barbed nail will hold more than a driven screw, besides being easier to drive straight, and less likely to split the wood.

The guiding lug which locates the lower section of the sash prevents mistakes and insures perfect working of the hinge.

Anyone familiar with the sash trade knows the weird mistakes even a good carpenter will make in hanging screens and sash, and how often angry customers will condemn a sash hanger as "no good" when it is only set wrong, perhaps even upside down. Full directions are printed on the wrapper of each set of the "Watrous No. 18."

## METAL CEILINGS AND METAL CONSTRUCTION IN SOUTH

 AMERICA.Advices have been received from South America of the progress of Yankee-made products in that section of the globe. Manufacturers have been able to secure a reliable line on the likes, dislikes and demands of the public as a result of the wide range of exhibits shown at the Railways and Land Transport Exhibition, held in Buenos Ayres, Argentine, last August.

As representatives of American, German and British manufacturers of all kinds of articles, Ritchie Hermanos y Cia reserved much space at the exhibition and an entire page of the weekly edition of the Buenos Ayres Herald was given over to a discussion of the articles.

Among those mentioned, as taking a firm hold in Argentine and other South American countries were the metal construction specialties, the metal ceilings and the steel furniture made by the Berger Manufacturing Company of Canton, Ohio. One of the exhibits was a small railway station building erected to show the advantages of the metal specialties. Its chief feature was its framework of metal lumber, which is designed to eliminate timber from the frames of light buildings.

This was hailed as something new and highly advantageous by Argentine contractors and builders. This new form of quick and light uilding construction is made of steel pressed into various shapes to form oists, studs, rafters, channels and many other members in general use. All these parts have prongs projecting every four inches when it is desired to fix expanded metal lath, so that the troublesome process of wiring the lath is done away with, it only being necessary to clinch the prongs to hold the lath.

Part of the building arranged for the exhibit was finished in Portland cement, showing solid partitions and hollow walls, both with expanded metal lath. A part was left as a skeleton to show the details of construction.

The Argentine Company, Ritchie Hermanos y Cia, has been doing a big business among contractors and builders as the result of the display at the exhibition, while they have installed a great deal of metal furniture and contracted for metal ceilings in many public and private buildings, particularly in Buenos Ayres,


We will mail your copy tomorrow if your address reaches us by that time.

## THE EMPIRE IRON \& STEEL CO.



YOUR SUCCESS IS OUR NECESSITY We Want to Show You Why
Your success is our necessity, because you will not buy our ceilings unless there is profit in them for you and satisfaction for your customers. customer's preference when shown our Catalogue. Send us plans with measurements custome will prepare drawings of appropriate ceilings, without charge, and name you
and we
low price on all material, F. O. B. your station.

Get our Catalogue B and agency proposition
THE TIFFIN ART METAL COMPANY
TIFFIN, OHIO
Manufacturers of Metal Shingles, V Crimp and Corrugated Roofings and Sidings, Eaves Trough, Conductor Pipe, Ridging, etc.

New York
Boston
Philadelphia Philadelph
St. Louis


Get one of our handsome illustrated catalogues and show your customers what artistic, durable, sanitary, fire-proof steel ceilings you can furnish.

There's profit in it. Write today.
The Berger Mig., Canton, 0.
Chicago
San Francisco We also manufacture Black and Galvanized Roofing, Eaves Trough and
Conductor Pipe, Sidewalk Forms, Sisewalk Lights, Tin Plate, etc.

The Home Beautiful
canalso bemade the home durable by erecting

which have been developed by twenwhich have been developed by twen-
ty years of constant manufacturing by years of constant manufacturing sheet metal works in the world. NGLES

## Fire, Water and Lightning Proof

ASK FOR SAMPLES AND CATALOG

## Milwaukee Corrugating Co.



## METAL CEILINGS.

The Edwards Manufacturing Co., of Cincinnati, Ohio, are sending out their 1911 catalogue of Embossed Metal Ceilings and Side Walls. They have recently completed extensive new factories with specially designed machinery, and are in a position to turn out work of the best grade in construction, quality and appearance.

The advantage of Metal over other forms of decoration are many, most of them obvious to the thinking contractor and builder. It is healthier and drier than plaster and of course undergoes no risk of coming down accidentally. The saving on Fire Insurance is an item, while it is as ornamental as plaster or wood carving at a fraction of the cost.

In some locations it is necessary to clean the surface frequently and here the advantage of metal over wood or plaster is immediately apparent. As the metal takes paint readily any desired decoration may be applied. As a rule, it is recommended that a flat finish be applied as this will better bring out the detail of the stamping

With every metal ceiling sold, the Edwards Company furnish a drawing showing the arrangement of the metal, which will enable the builders to erect the work without loss of time for laying out, fitting, etc.


While it is manifestly impossible to review all the advantages of metal over other forms of decoration a glance at the cut at the top of this article will convey an impression of the beauty of the finished work and the purity of style with which the designers have worked. The catalogue contains nearly $20010 \times 14$ pages and shows a great variety of styles in plates, moldings, cornice, fillers, panels, wainscoting, etc., for every purpose. A great variety of finished rooms are shown including halls, stores, theaters, restaurants, banks, residence interiors, bath rooms, etc. The Edwards Mfg. Co., are placing their goods through local representatives as far as possible, and we understand that there are a number of excellent opportunities for contractors and builders to represent them in their locality.

## INVESTIGATE THIS LEVEL

To those of our readers who are not already familiar with the merits of the Bostrom Level, or those who have been a bit skeptical on account of the very moderate price fixed by the manufacturers, we make a special request that a careful reading and consideration be given to the manufacturers' new announcement in this issue.

While a large number of our readers have already taken advantage of the opportunity of equipping themselves with one or more of these moderate priced, but thoroughly dependable Levels, there are those who have assumed since it has heretofore been necessary to pay much more to obtain a satisfactory Level, that it is still so, but the best proof of the incorrectness of this reasoning is the fact that those who have put their money in a Bostrom Level are the ones who have, by their unreserved and unqualified endorsements, established the fact that Bostrom's Improved $\$ 25.00$ and $\$ 30.00$ Builders' Levels accomplish all that is required or expected of Levels costing double the price, and in many instances meet individual requirements as completely as instruments costing several times as much.

You will find the manufacturers, Bostrom-Brady Manufacturing Company, of Atlanta, Ga., thoroughly reliable in their dealings, and we hope a large number of our readers will carefully read and accept their offer, as it is certainly as liberal as one could ask, the manufacturers assuming all risk, they requesting simply an investigation, thus allowing the instrument to make its own sale or not, you being the judge.

## NEW HACK SAW FRAME.

The Simonds No. 41, Straight-Cut Hack Saw Frame, patented February 11, 1908, and just lately put on the market, is said to be setting the pace for sales in high priced Hack Saw Frames.


The straight-cut idea is decidedly novel and the Simonds' adaptation of that idea is one of the most simple and practical ones so far presented. The mechanic will readily appreciate the advantages of using a Straight-Cut Hack Saw Frame since with one hand he gets a better control over his work when using a Straight-Cut Frame than e had with both hands when using the old style frame.

The Simonds No. 41 is adjustable to blades from 8 to 12 inches long. It is manufactured exclusively by Simonds Mfg. Company, Fitchburg, Mass., and Chicago, Ill.
A CONVENIENTLY ARRANGED SIX-ROOM BUNGALOW. By The Bungalowcraft Co., 407 Chamber of Commerce, Los Angeles, Cal.


This attractive little house has just been completed in Los Ange! $!$ as at a cost less than $\$ 2,500$, with oak floors and paneled wainscoting in the living room and dining room; built-in buffet, pressed brick mantel, large open fireplace, built-in bookcases.
the exterior presents well balanced and artistic combination of cobble stones and wood with a low pitched roof of simple but attractive design. The floor plan shows the arrangement of rooms and the many attractive and convenient features of the house. The endeavor hroughout the planning of his house has been to save steps and labor for the housekeeper and a full measure of success has been attained.

As built in Los Angeles there was no cellar and no furnace, but this could readily be arranged if the house is built in a cold climate. The inside trim is of Oregon Pine, stained, except in the bathroom and bed rooms, where it is enameled The walls are plastered with hardwall plaster and tinted.
The Bungaloweraft Company state that any inquiries regarding bungalows or bungalow building will receive prompt and detailed replies without charge.

## ECLIPSE CONCRETE MIXERS.

In Bulletin Y 40, The Standard Scale \& Supply Co., 1345 Wabash ve., Chicago, illustrate a very complete line of Batch Mixers. To be of practical use a Mixer must have wide usability. It should $\operatorname{mix}$ grout or dry plaster, top finish, or heavy gravel from the pit for massive foundation. For speed it must be loaded and discharged quickly, and above all, must be portable, for concrete must be mixed on the job under the eye of the superintendent, who has his other eye on the placing of the concrete. The experienced contractor will be quick to see the advantages of the Eclipse as shown and described in the above mentioned bulletin, which will be sent on request.



The many friends of Geo. H. Bishop were shocked to hear of his sudden death on April 14th, at French Lick Springs, where he had gone to recuperate after an extensive Western trip. Mr. Bishop was president of Geo. H. Bishop \& Co., of Lawrenceburg, Ind., and made friends, and retained them, through his genial disposition and kindly manner, which endeared him to all his acquaintances. While of a most kindly spirit, Mr. Bishop was at all times an exceedingly aggressive man. At an early age he left his home in Southern Indiana and made his way to Cincinnati, Ohio, where his first business experience was gained in the jewelry establishment of Duhme \& Company. Late in the '80s he became connected with the National Saw Company, representing them on the Pacific Coast and in Canada and British Columbia, until their absorption by another manufacturer.

Mr . Bishop then purchased a factory at Lawrenceburg, Ind., the present location of the Bishop Saw Works. He was a 32nd degree Mason, Knight Templar and Shriner. The funeral services were conducted by Trinity Commandery No. 44 of Cincinnati, in the Scottish Rites Cathedral.

## HARDWARE SPECIALTIES.

At the time the Wilcox Manufacturing Company, of Aurora, Ill., consolidated with the Richards Manufacturing Company of the same city, to be known as the Richards-Wilcox Manufacturing Company, the former company had in the press an extensive catalogue of their hardware specialties

This catalogue, which is now in our hands, shows a very complete line of well known Wilcox Door Hangers, and also their specialties, among which are Bench Vises, Wrenches, Store Ladders, Grindstones, etc. Particular attention is called to their Auditorium Hanger, by means of which two rooms may be thrown in one, or a large room as quickly made into two or more. This hanger is sed extensively in schools, churches, lodge rooms, etc.

Aside from making the goods of the materials best suited to their use, the most important qualities should be adjustability, that it may overcome inequalities in the floor, settlement, etc., and permanence, requiring no repairs or adjustments in the hardware itself, due to working loose or wearing unevenly. The appearance of the goods illustrated and described would indicate that the RichardsWilcox Manufacturing Company had brought the goods to a high standard of perfection. A catalogue of all these interesting speciatlities will be sent to the carpenters and builders who write to the Richards-Wilcox Manufacturing Company, Aurora, IIl.

## GALVANIZED WALL TIES.

The Niagara Falls Metal Stamping Works, Niagara Falls, N. Y., are mailing a folder descriptive of their $12-\mathrm{in}$. Galvanized Wall Ties These ties are invaluable for stone and concrete block walls, where there is a danger of cracks or openings occurring in the walls due to faulty foundations or imperfections in mortar or laying. Every tie that is sent out from the factory is thoroughly well made, and the fact that many of the leading architects are including them in their specifications speaks well for the quality of the product. Concrete block walls have quite as much tendency to crack as brick walls, and probably more, and the ties, whether single or double width, properly placed and used in sufficient numbers are proof against cracks. Builders and contractors desiring samples should write the manufacturers, as they are glad to send samples free to any one interested.

## INCREASING DEMAND FOR BRICK FIREPLACES.

The growing interest in brick mantels and fire places renders it imperative that the architect and builder should have close knowl edge of the subject, for while nothing is less attractive than a crude arrangement of poor bricks poorly arranged, and called a fireplace the sold dignity and elegant simplicity of a real brick mantel ap peals to every person of good taste. Brick fireplaces were formerly peals to every person of good taste. Brick fireplaces were formerly
thought only appropriate for clubs, hotels, large residences and thought only appropriate for clubs, hotels, large residences and
other places where space and money were abundant. At present other places where space and money were abundant. At present many plans for moderate sized and cost homes are arranged fo several brick mantels. The magazines devoted to home building have steadily created a strong desire for the right kind of brick antels in a nation rapidly growing in culture as well as wealth

The Bradford Pressed Brick Company of Bradford, Pa., have produced for sixteen years the highest type of face brick. Their reds gave the rich, warm color of the natural shale peculiar to that part of Pennsylvania. Their mantel catalogue shows a great variety of shapes and sizes in their moulded lines. The bricks are packed and marked and their laying so accurately described that no builder can fail to construct a perfect fireplace and mantel that will be free from defects, once seeming necessary in a brick fireplace.

The cost of the bricks, panels, moulding, returns, etc., for a complete mantel will vary from $\$ 23$ to $\$ 56$, and the setting can be done by any good mechanic. Correspondence is invited by this reliable company, whose product has been favorably known to the editors of The National Builder for many years.

## MODERN INTERIOR TRIM.

In a recent number of the National Builder several arrangements were shown for utilizing the space of unused door openings. FrePown venience somewhere, and it is
 with the purpose of supplying the want without the inconvenience that the Huber Builders Material Company of Cincinnati, designed the door shown herewith. As will be seen, the door simply has a large plate glass mirror in place of the wood panels usually furnished.

It is possible that to some, the grain in the wood panels and rails is preferable, but in many places, space is an item and the mirror door will usually be given the preference. The appearance is often that of an enlarged room while the usefulness of the mirror is apparent.

The door shown above is only one item from the 1911 catalogue of the Huber Building logue of the Huber Building
Company. This catalogue should Company. This catalogue should
be in the hands of every conbe in the hands of every con-
tractor and builder as there are tractor and builder as there are
many bargains and novelties listmany bargains and novelties ist
ed. This catalogue is sent free by the Huber Building Company, Vine and Second Sts., Cincinnati, Ohio.

## WOOD CARVINGS.

The great charm of wood carving, whether on a part of the structure or as applied ornament, has occupied the minds of the best artists for centuries. Until the introduction of high grade wood working machinery, the cost of this class of work was so high as to allow its use on only the most expensive work. At the present time, however, the improvements in processes of manufacture enable the however, the improvements in processes of manufacture enable the
cabinet maker, carpenter or builder to secure the highest grade of work at only a slight increase over the cost of the materials.

There are few concerns which have done more to improve meth ods of manufacture and bring the business to a commercial and artistic perfection, than the Waddell Manufacturing Company of Grand Rapids, Michigan. In their catalogue and revised price list No. 21 are shown over a thousand designs of wood carvings. Stair work, Newels, Ramps, Easements, Balusters, Mouldings, Ornaments, Grilles, etc., for practically every purpose in building or furnishing There are grilles and pedestals for the house, knobs, rosettes, and scroll ornaments for furniture. By their improved methods they scroll ornaments for furniture. By their improved methods they
produce all the fine effects of handwork at machine prices. They produce all the fine effects of handwork at machine prices. They
also employ a staff of skilled designers and hand carvers, by which the designs of the architect may be carried out from either sketches or detail drawings. This service is only slightly more expensive than the machine work, and adds greatly to the individuality of the work.

The catalogue shows in photographic reproduction their stock patterns. From these can be seen the artistic perfection and beauty of detail of the carvings, and it is usually possible to make a selec tion particularly adapted to the work in hand. A charge of 15 cents to partially cover the cost of packing, postage, etc., will bring the book to any of the National Builder readers. Address the Waddell Manufacturing Company, 67 Coldbrook St., Grand Rapids,
Mich.


Pronounced SI-MONDS

This Saw is the Manufacturer's own brand saw; therefore note carefully the trademark which is on it. It is covered by the manufacturer's guarantee. It is vouched for by hundreds of Carpenters throughout the United States who during the past few years have slowly but surely become better acquainted with this saw. It is made of Si monds Steel, a steel manufactured exclusively for saws in Simonds own steel mill.

Note the pronunciation of the name. Ask your Hardware Dealer for the Si-monds Saw. Each Saw packed in a separate case. This Saw is made especially for those who care to pay just a little bit more for the satisfaction of owning a superior article.

## Simonds Manufacturing Co .

Fitchburg, Mass. New York City Portland, Ore. Vancouver, B. C Chicago, III. New Orleans, La

San Francisco, Cal. Lockport, N. Y. Montreal, Que. Seattle Wash. London, Eng. St. John, N. B.


38 Times More Effective Than Building


BUILD houses that keep the outside out and the inside in, that keep out the cold of winter and the heat of summer, that keep in the warmth in winter and the cool in summer. Put up houses and buildings that keep out sound, the rooms of which are quiet and restful. Getting these features will add less than one per cent to the cost of your house, will add more than $40 \%$ to its comfort and living value and will effect a constant saving of $40 \%$ in all fuel bills. Architects, contractors and carpenters are the ones able to appreciate most the superiority of Linofelt because they know how unsatisfactory is ordinary building paper.

## These Plans Show The Method

They show you clearly the practical and simple method of insulating walls and floors with Linofelt. Every carpenter, every builder, every architect realizes just what these little plans mean. They are keen to the advantages of building according to these methods. They know how important such efficient insulating of walls, floors, ceilings and partitions is to all classes of homes and buildings. We might emphasize residences, office buildings, hospitals, school buildings, stores, and buildings constructed for manufacturing purposes These must have the uniform warmth in winter, coolness in summer and the quiet al the time that Linofelt insures.
Anyone who knows Linofelt immediately Anyone tho knows becomes enthusiastares. It is an insuso many delightful features. It is an insu-
 cubical contents considered. It comes from the same source as linen. It is made from flax in the largest flax market in the world-Winona. It is odorless, chemically clean, as sanitary as a surgical dressing.
We have had made comparative tests of Linofelt and other sheathing mediums for sound deadening qualities. We will send them on request. The same sound heard 200 feet through ordinary building paper is heard only 2 feet away through Linofelt. Tests prove Linofelt more than 38 times as effective as building paper for all uses.
Let Us Place All The Data In Your Hands
Let us send you an attractive book for Architects, Con Lectors and Carpenters showing Linofelt in all forms, tell tractors it is made, showing and explaining plans and methods ing how Linofelt, illustrated with excellent photographs of resiof using Linofelt, located in different climates dences and buil this meaty book because it also tells in like manner Let us send of Lith Board and Rock wool. Let as acquarld ef experience in insur Department,our own engineers, who have a world of experience in insulating work, who have pursued it under be of the greatest assistance to you in your work, who are fully equipped and qualime regarding any of your work gratis. Let us send you whom you can consinofelt so that you can see it with your own eyes and feel it with your a free hands and have a close realization of its extreme effectiveness, have a firm knowledge
own her that it will do more than we claim it will the name of the dealer nearest your home.

## Union Fibre Co.



30 Union Avenue, Winona, Minn. The Philip Carey Co., Distributors Cincinnati, Ohio
Branches and Warehouses in all the large

United States,
Canada and
Mexico.


COLD WEATHER TROUBLES IN SHINGLING
Pearson's Nailer
for it works as well in one season as another. Wear your gloves or mittens
and (with it) drive more nails than you ever did. Quit usingyour mouthas a nail Douch. PEARSON NAILERS are made in two sizes.
The Blue Nailer is for nommon 3 d No is for the galvanized 3 d, No. 13 , 114 -in. wire mails. $\mathbf{\$ 5 . 0 0}$ each express prepaid. Money cheerfull y returned if Nif Nailer is not ot as represented.
PEARSON MFG. CO.
Robbinsdale, Minn.

## Producers <br> of ROOF SLATES  

Slate Blackboards
Guaranteed Strongest and
Pamphlet with setting instructions on Best Finish THE E. J. JOHNSON CO.

## ARCHITECTURAL DRAWING MADE EASY

By HICKS 94 pages, illustrated and cloth bound, $\$ 1.00$ postpaid. The best yet on drawing plans. Your money back if you are not satisfied with this book. Get a copy of
HICK 'S $\underset{\text { and your troubles in }}{\text { ESTIMATORS' }}$ estimating are over 170 PAGES-CLOTH BOUND-PRICE $\$ 1.00$
I. P. HICKS, Box 22, Station A Omaha, Neb.

##  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.

Over 4,000 Builders and Architects

Bought copies of the second edition of "California Bungalow Homes" during 1910. Half of them wrote back that the book was worth many times its cost. New (3rd) edition is just ready Price $\$ 1.00$ postpaid. Send for a copy. The Bungalow is the thing, and this is the only book published which shows the REAL California Bungalow inside and out. Better send at once.
The Bungalowcraft Company, 407 Chamber of Commerce, Los Angeles, Cal.


Cassens Ideal Eaves Trough Takes Water It satisfactorily catehes and carries a way the water that falls on your roof. Its use insures clean, healthful cistern water. Leaves, trash, gravel, etc., cannot enter it. Neither can birds build nests in it. Therefore it is never clogged. Ice will positively not break down the trough
A unique and important feature of the ID and ice. When itsleets the small opening a is that it will not fill with snow closed. This prevents the bursting of the trough, also of the down spout. When it thaws the ice melts, and the entrance opens automatically before the water The Ideal can now be e

Special Properected with a Wire Hanger if face-board has mouldings. tons to Contractors, Builders and Architects
CASSENS MANUFACTE For free booklet
Edwardsville, III.

## MOTORCYCLES FOR CONTRACTORS.

A noted writer speaking of the mistakes man in general is prone to make stated, "The average man's errors can be divided into two classes. The errors of commission and the errors of omission." Of these two with the contractors, the first is undoubtedly by far in the minority.

The average contractor of today has generally so thoroughly mastered his profession or has had sufficient experience "burning his fingers" to thoroughly convince him that contracts which call for things "he don't know" had better be left alone, therefore the average contractor's loss from "doing things wrong," due to lack of knowledge is small.

Errors due to omission, naturally cover by far the majority of contractors' losses. This is undoubtedly due to the small margins on contracts in general, combined with the natural ambition of the American contractor to "get along." Many contractors in the phraseology of the day "bite off more than they can chew." They bid on a number of contracts and fortunately or unfortunately, as the case may be, are awarded more work than they can personally supervise thoroughly. Then come the losses through omission. This or that goes wrong. Errors arise which before they come to the contractor's attention, have absorbed more or less of his margin. The writer personally knows two or three contractors whose annual losses would have made a fair start for a saving account. Obviously the easiest way to overcome or remedy this great source of loss must be one which will broaden the scope of the ordinary contractor's personal supervision. Many of the large contractors realizing this have purchased automobiles and found that by means of same, they can nearly double the amount of work they could formerly properly supervise. The original investment as well as the up-keep, however, has prevented many from adopting this method. To this, by far the larger majority, the motorcycle should prove a boon. The writer recently talked with one large contractor who stated that he had used horses, autos and finally the motorcycle. Now he uses the motorcycle entirely as he finds he can not only get around faster "I crowded districts, but much more economically. He says in part, don't know what the motorcycle made in Milwaukee. I don't know what the up-keep cost of the other machines may be, but I do know that my operating cost is but a fraction of a cent per mile, in fact, far less than my former carfare and I further know that my motorcycle has saved me its original cost time and time again. When I considered the purchase of a motorcycle, I looked at it from a purely business standpoint and sat down and figured it out. I estimated my time as worth $\$ 2.00$ per hour and when I figured the hours a machine could save me-well, there stands my motorcycle.

Now four of my carpenters and two of my masons have purchased machines and are living out in the suburbs, where rent is cheap. Although one of them lives nearly five miles away from his present work, yet he finds that the hour's nooning gives him ample time to run home and have a hot dinner. Each of them have a luggage carrier or rack right over their rear wheel to carry their tools on. The motorcycle brings me nearer to being in two places at once than any other mode of conveyance."

Here's food for thought, Mr. Contractor. Personally, I don't know whether this contractor was right or not, but I do know were I a contractor, I should most assuredly investigate.

## THE A B C PROTRACTOR AND SQUARE.

Practically, the difference between an ordinary workman and a foreman is in the latter's ability to lay out the work. In carpentry, as in stone masonry, a knowledge of geometry and mathematics is usually necessary in order to accomplish some of the commonest forms in construction, and, while it is always convenient to have an understanding of the sciences, the ingenuity of modern designers has obviated the need of detailed technical training and enabled the mechanic who knows what he wants to do to perform the same operations mechanically as the technical man does with mathematics. An instrument of this character is the A B C Protractor and Square, made by the Crookston Tool Company, of Crookston, Minn.


This instrument, as seen by the cuts herewith, consists of three parts working together, the different pieces being lettered and fig-
 the right-angled triangle, and is capable of giving any of the cuts required on a building, no matter how intricate, and it will give the ength of rafters, etc., as well.

This instrument, so simple that it is called a tool, is meeting with deserved success wherever introduced, and readers of The National Bumper who are not already acquainted with it should investigate.

We understand that the Crookston Tool Company, who are placing this tool on the market, guarantee that it will do all they claim it will. Aside from the very complete directions which come with the tool, they are always willing to explain fully any point not perfecty clear to the user.

## THE MAN THAT MAKES THEM SAYS:

 The@FLCOS@OMochiselissolad under the positive guarantect that it will do more work than any other chisel.Stis not made by chance, but by authorough scientific process. Sticould loof the same and cost half as much git's whatypowdonit see in my chisel that makes the cost-and gives the service. Sinsiston everyuser being a satisfied user.
Q.JW. Learner

MR. TOOL USER:
If you want information about the best chisel made, have your dealer write the maker.
 108 W. Lake St., Chicago

## HERES THE LEVEL THATS ALWAYS RIGHT




## FOR ALL PURPOSES



## CORTMRIGITT Metal Shingles

What appeals to Carpenters and Builders about Cortright Metal Shingles is the fact that they have all the advantages of other forms of of roofing and employ

Cortrights they can use for any style building, and can be laid by their own men, eliminating trouble and expense of employing special skilled workmen.
And best of all-besides these advantages he is able to overcome with them any kind of roof competition, for Cortrignts are Fireproof, Stormproof and will outlast the building without needing repairs, and at the same time afford a far more handsome roof.


All these facts are illustrated and described in our catalogue "Concerning That Roof." It also shows how Cortrights actually look on all kinds of buildings. Write us for our proposition.
Cortright Metal Roofing Company
philadelphia and chicago

## SCREEN CARPENTERS MAKE \$6 A DAY

Putting the new FLY ESCAPE ATTACHMENT on ordinary old style window-screens, and making the new ESCAPE fly
screens.
Thousands are already in use.
Endorsed by best homes everywhere
Exclusive Agency Proposition. Act quickly.
CHATTANOOGA SCREEN CO., - Chattanoogóa, Tenn.
Wright's ESCAPE fly-screens: made to order

WHAT WOULD YOU SAY if you had Wall Brackets that would last a lifetime?


Be decidedly cheaper than con tinually making wooden onesould it not? Absolutely safe too.

Write for catalogue and special trial offer.
JAMES L. TAYLOR MFG. CO. Bloomftiold, N. J.

## CARPENTERS, Ready Reference Roof Framing

is a copyrighted book that gives lengths of common, hip valley and jack rafters, and the figures to use on square for all cuts for following pitches:
111353 Also octagon rafters for same pitches and a scale for polygon 432884 miters up to ten sides. Can be carried in vest pocket. A handy time-saving book for anyone to have. Sent postpaid, for 25 c .
E. OEHRLE, 2567 Dodge St., Omaha, Neb.


## DON'T ORRDER

 Lignine (Wood) Carvings, Unbreakable
## investicate

Send postal for FREE sample and catalog. One cent
investment saves dollars. LET US PROVE THIS. ORNAMENTAL PRODUGTS CO. West Lafayette Ave., DETROIT, MICH.

## Wood Carvings for Interior Finish



SEND 15c for catalogue showing 1,000 designs on Ramps, Easements, Newel Posts, Mouldings and Balusters.

Write Today
WADDELL MFG. CO. ${ }^{67}$ Solbrook Sreet Grand Rapids, Mich.


## Consoles, Columns and Grilles

add to the fine appearance and value of any building. Especially if they are made by us. In quality and price our work is not surpassed.

SEND FOR CATALOG No. 16
It contains many beautiful designs of Consoles, Columns and
Grilles.
NORTHWESTERN GRILLE WORKS
NORTHWESTERN GRILLE WORKS
Office and Showroom, 1824 Milwaukee Ave., CHICAGO

## FLY ESCAPE SCREENS.

With the approach of the warm season we are again confronted with the "fly-question." In some parts of our cauntry we have the question the year round, complicated by mosquitoes and other insects.

To a certain extent these can be kept out at the wnidow openings, but the opening doors allow enough to enter to make trouble for the susceptible. To get them out after once in is difficult as opening a door simply lets more in, and the ordinary driving out results in merely a stirring up and adding new blood.

To remedy this evil, and get the pests out after they get in,


The Chattanooga Screen Company make a clever device to be attached to old screens or incorporated in new ones. The ingenious construction seems to lead the flies to the "exit" and through the turnstile to the open air; with them goes the danger of contaminaturnstile disease and annoyance.

The Chattanooga Screen Co., Chattanooga, Tenn., make screens having this device and want to hear from everyone before ordering screens.

## STYLE AND DETAIL IN SHEET METAL WORK.

The Empire Iron and Steel Company of Niles, Ohio, in their catalogue of Metal Ceilings and Sidewalls, shows a number of excellent designs of the French Renaissance, Louis XIV and Colonial periods. Fidelity to the detail of these periods is difficult in most classes of decoration, as the delicacy of the detail is easily destroyed by the necessary repetition. In the example shown in this catalogue the technique of the artist is faithfully reproduced in the finished product, while the greatest attention is shown to the constructive detail in order to allow sufficient leeway for the mechanic when installing the work. Extreme accuracy is possible in the drafting installing the work. Extreme accuracy is possible in the drafting
room and possibly in the shop, but as a rule the workman installing room and possibly in the shop, but as a rule the workman installing
the finished work meets unforeseen obstacles to clocklike precision in the installation, due to interference by other mechanics, avoiding other work, scaffolding, etc. To furnish plates, etc., to fit properly under these conditions, requires the experience which only comes with close intimacy with the details of construction, manufacture and erection.

We understand that the Empire Steel and Iron are well equipped to do this class of work.

Rules for measuring surfaces are given in detail, so that no difficulty should be experienced in ordering. The prices also are given, making the work a ready reference on the subject. This given, making the work a ready reference on the subject. This
catalogue, we are advised, will be sent free to interested readers catalogue, we are advised, will be sent free to interested readers
of THe National Bumber and those contemplating the use of Metal Ceilings, by the Empire Iron and Steel Company, Niles, Ohio.

AN ADVERTISING CAMPAIGN IN THE INTEREST OF BUILDERS AND ROOFERS.
Builders and roofing contractors will be interested in the advertising for Asbestos "Century" Shingles, which the Keasbey \& Mattison Company are running in "Country Life in America."

The campaign started with the December issue of this magazine, and will be continued monthly, the advertisers state.

Each advertisement shows one of the hundreds of handsome private and public buildings which are roofed with Asbestos "Cenprivate and public buildings which are roofed with Asbestos "Cen-
tury" Shingles, with strong text on the merits of this well-known tury Shingles, with strong text on the merits of this well-known roofer for estimates and quotations.


We reproduce on this page the illustration from the second of these announcements-showing the Communal Theater of Fiume, Austria.

Builders and roofing contractors who are not in touch with the Asbestos "Century" Shingle proposition will do well to write tothe Keasbey \& Mattison Company, at Ambler, Pennsylvania, and get into position to take advantage of the added demand that is sure to be created by this advertising.

## EVERY CONTRACTOR

## LARGE OR SMALL WOULD BUY A

# Bostrom Improved <br> If he would just drop us a line to ship him one for inspection and approval. We say that 

 because we have never known a Contractor, Builder, Architect, Surveyor, Civil Engineer, or even Instrument manufacturer to inspect a BOSTROM LEVEL who did not concede that at the price there had been nothing yet produced which would compare with the Bostrom in all the pricessary essentials of a simple, accurate, durable and throughly dependable Level

Another thing, the Bostrom Level possesses means of adjustment for proving its accuracy, not surpassed by the highest priced Engineer's Level, and this principle is applied in such a novel and simple manner that even the inexperienced operator can prove his work right on the spot, and it can be done in a mere fraction of the time required to prove the accuracy of any other level, regardless of the price.
You have to examine the Bostrom Level to appreciate all of its merits, but the above feature alone makes sales on sight, and a sale always means a Bostrom endorser.
We back up every statement we make with a GUARANTEE of satisfaction or money back.
Our terms are cash with order, or shipment made C. O. D. SUBJECT TO EXAMINATION. Prices: No. 3, \$25.00; No. 4, $\$ 30.00$, f. o. b., Atlanta. Shipping weight 15 lbs., and complete outfit includes Level, Tripod, Graduated Hardwood Rod (not furnished by any other manufacturer with-
out extra charge), Target and Plumb-bob, Trivet, and neat oak box for keeping Level when not in use. Eyepiece in No. 3 Telescope has magnifying power of 10 to 12 diameters, with sliding focus; and eyepiece in No. 4 Telescope has magnifying power of 18 to 20 diameters, with rack and pinion focus.
If you are needing Level at once, order direct from this article, as we do not even require you to guarantee express charges (and no other instrument manufacturer ever made such an offer). We don't hesitate to do it, as we have shipped thousands of Levels in that manner, and the enthusiastic endorsements of these purchasers gives us the unlimited confidence that the Instrument will please you. If you are not needing Level right away, write for full description and get acquainted with the Bostrom before buying. Bostrom's Levels are used and endorsed in every State in the Union, and are rapidly taking the place of instruments much higher in price, and you owe it to yourself to inspect the Bostrom before buying.

## BOSTROM-BRADY MANUFACTURING CO.

126 Madison Avenue

ATLANTA, GA.

## Wintr rop Solid Tapered Asphalt Shingles

## ARE OF A COOL, GRAY SLATE COLOR

And have the durability of asphalt-the fine appearance of slate and the light weight and cost of wood shingles. They are fire-resisting -weather-proof-wind and sun-proof and never crack, break or fall off. Laid with regular shingle nails, the same as wood shingles.
SPECIAL INDUCEMENTS TO THOSE WHO APPLY FIRST ROOF IN EACH TOWN CHICAGO, ILLINOIS


## UFKIN <br> Steel Measuring Tapes



With Instantaneous Readings can be used at all times and under lutely accurate in themselves and the improved graduations make errors impossible. Send for catologue No. 12.
THE /UFKTN RULE Co. SAGINAW, MIICHIGN, U. S. A.


## THE WATROUS No. 18 SAFETY SASH HANGER

EASIEST AND QUICKEST TO SET
Won't blow off or be dropped off by ehildren or careless
servants. Can't be set wrong. The best of them all. Only sash hanger on the market with best of them all. make it impossible to set it in any way but the right way.
Nine-tenths of the trouble with sash hangers Nine-tenths of the trouble with sash hangers comes from
their being set wrong. The Watrous No. 18 is ALWAYS cheir being set wrong. The Watrous
right. Full directions with each set.
E. L. WATROUS MFG. CO., Des Moines, Iowa

## Whipple's Automatic Blind Hinge

Recsons Why $\left\{\begin{array}{c}\text { Cannot tlam or blow off. } \\ \text { Nof }\end{array}\right.$


Write Today
THEY ARE No futtening required. $\xrightarrow[\text { Clircular E }]{\text { E }}$

We also manufacture a flush hinge, constructed on same principle Two styles, for brick or wood buildings
R. P. WHIPPLE \& CO. 277 Main St., Springfield, Mass.


## The Window Chute

FOR BUILDERS OF MODERN HOMES
Admits light, locks automatically, and is burglar proof. Very easy to install. Write for price and catalogue giving ten special advantages.
HOLLAND FURNACECO. HOLLAND, MICH.


## Electric Light Systems <br> for RESIDENCES, STORES, HOTELS, CHURCHES

 or any building not connected with a city plant.Low cost toinstall and operate. Just press button for flood of flight.
Electricity for door bells, burglar alarms, flat irons, vacuum cleaners, etc., can be had from the same plant. Architects, contractors and builders write for our special
proposition for installing the first plant in your town. Jobomitor ior inalaing tie int plantin your town.
JOHNSTON MANUFACTURING CO.
Manufacturers of the "Bess" Water System for Country Homes.
No. 6 Eleventh Street,
KANSAS CITY, MO.
Topp's Framing Tool A PERFECT TOOL, AND THE
ONIY TOOL FOR THE PUR-
POSE EVER IN VENTED


Saves from 3 to 24 hours in laying, out a single roof.
Saves time for the skilled mechanic, and enables the ordinary workman to frame the most difficult roof
IT DOES ALL THIS
It is accurate, thus preventing all mistakes. It isives angeses for any pitch.
It gives lengths for any rafter
It gives lengths for any rafters.
It gives lengths for any rafters.
It gives cuts for principals, jacks, hips, valleys and
cripples.
G. A. TOPP \& CO., Indianapolis, Ind. $\begin{gathered}\text { See tool at Your Hardware } \\ \text { Dealers. }\end{gathered}$


Van Dorn's Steel Joist Hanger $\begin{gathered}\text { Has no } \\ \text { Equal }\end{gathered}$

Send for Catalogue
THE VAN DORN IRON WORKS CO.
No. 1-Steel Joist Header. CLEVELAND,
Structural Steel and ornamental Iron Workers


## KEYLESS LOCKS.

It is easy to lock the door after the horse is stolen, but how much better to put a lock on before. And not only a lock, but a lock which is proof against the many failings of ordinary locks. Some locks are easily picked. Some get out of order and won't work when most wanted. Keys get broken, lost or mislaid. There has recently been placed on the market a lock which the manufacturers claim is proof against all these accidental annoyances. And at the same time offers perfect protection against all not inclined to be perfectly honest. The Dayton Keyless Lock Company make a number of styles of Keyless Locks suited to the finish of various styles and all embodying the principles of ease of operation and absolute protection. The lock is operated on such a simple system that a child can quickly open the door in the dark, while the combination can be changed in a few minutes should it be considered advisable.


The Dayton Keyless Lock Company, 804 U. B. Bldg., Dayton, Ohio, are sending convincing literature to all interested and are anxious to get in communication with men in the building field who will act as salesmen for them.

## OF SPECIAL INTEREST TO BUILDERS.

The David White Company, 421 E. Water, Milwaukee, Wisconsin, Manufacturers of Surveying and Engineering Instruments, have perfected a high-grade Combination Level and Transit as illustrated in cut herewith. This Instrument is a saver of both time and labor, two items of importance to the Builder, and is an Instrument no Builder or Contractor can Builder or Contractor can
afford to be without. It
 afford to be without. It
can be used to plumb a wall, line up girders, lay stakes, grade streets, square buildings, etc., and will practically do the work of a Level and Transit as well.
It is constructed the same as our Improved Architect's Level, with a Telescope $12^{\prime \prime}$ in length and adjusted in the same manner as the larger Levels. The lenses are of the best optical quality, magnifying power about 25 diameters, object glass $11 / 4^{\prime \prime}$ and is provided with 4 leveling screws and clamp to spindle. The Y's have an improved locking arrangement, dispensing with the pin bolts. It has also a horizontal circle $41 / 2^{\prime \prime}$ in diameter fitted to the upper end of the socket and turning readily upon it; the circle is graduated from $0-90$ each way, and has a vernier to read to 5 minutes, which is screwed to the flange of the center. The Telescope is of good definition and is focused by rack and pinion. The eyepiece turns in a screw like manner to enable precise focusing of the cross hairs. The Tilting Level has an addition of an attachment by which sights of 45 degrees above or below the horizontal can be taken. This attachment is a small set of standards screwed into the center of the level bar and when not in use can readily be removed permitting the telescope to be set back in the wyes. The Instrument is supplied complete with Tripod, Trivet Sun-Shade, Plumb-Bob, etc. Write for Catalogue and Special Prices.


## Where the Big Bargains Come From

Out from these great concrete warehouses come the greatest millwork and lumber bargains that the American market affords.

Our whole business revolves around the bargain idea. The present building season finds us better equipped than ever before to save money for contractors and builders: You will be amazed to see the big reductions on staple millwork and lumber of highest guaranteed quality.

## New Bargain Catalog Ready

This catalog is in itself an immense exhibit of the finest building material on the market. It offers an almost unlimited variety of the latest styles in millwork of every description. Doors in all regular sizes and in scores of new and beautiful patterns and in various woodsveneered doors in Colonial, Mission, Craftsman and other popular styles-art glass doors in exquisite designs and colors-doors for every purpose. Windows to correspond with every style of door. Mouldings, inside finish, flooring, mantels, stair and porch material-everything that goes into any home, down to the very last detail. A bargain price and a guarantee of quality safe delivery and satisfaction on every item. Send for the catalog and see for yourself.

## New Plan Books-Just Out

The new Gordon-Van Tine Book of Plans, prepared at a cost of over $\$ 5,000$, is now ready for free distribution to carpenters and contractors. A complete and practical work that gives 32 designs for city, suburban and country residences, cottages and bungalows costing from $\$ 600$ to $\$ 6,000$. Also 12 plans for barn, dairy and cattle barns and other outbuildings. This book keeps cost within original estimates, for every plan has been proved again and again by actual construction.

The Plan Book will be mailed free on receipt of 10 cents in stamps or a dime to cover cost of packing and mailing.

## You Are Invited to Visit Our Vast New Millwork and Lumber Plant

Although we conduct our business entirely by mail, we like to have carpenters and contractors visit our plant. Hundreds of them do this every year. Our warehouse is the busiest place in Iowa. Come and see us loading 22 cars at a time from our loading platforms, extending the entire length of the plant. Meet personally the men who stand behind this gigantic enterprise. The latch-string is always out.

No. E 322-Colonial Built-up Column; Cypress, Plain Cap.

## \$1 $\underline{\underline{6}}$

Dealer's Price, $\$ 3.25$

## We Can Save You Hundreds of Dollars This Season

Why pay middlemen's double prices for millwork, lumber and other building material? Save several hundred dollars this season by buying at wholesale prices direct from

## GORDON-VAN TINE COMPANY

No. E 323-Colonial Built-up Column; Cypress, Fancy Cap.

## \$222

Dealer's Price, $\$ 4.75$


## DO YOUR WORK ON THE LEVEL <br> AND USE A <br> WHITE'S $\underset{\substack{\text { IMPRoved } \\ \text { TILTING }}}{\text { LEVEL }}$

which will guarantee you against errors. It will pay you to
inve stigate its merits. Write for Catalogue and Special Prices. LEVELS for $\$ 16$ and Upwards

f. 7

DAVID WHITE COMPANY, 421 E. Water St., Milwaukee, Wis.

THE JACKSON ALUMINUM LINE LEVEL


Is designed particularly to meet the requirements of all Mechanies in
builining construction, eespecially Brickliayers, Masons, Carpenters,
Mill Millwrights, Architectst, and Cement Workers. Hy using the Aluminum Line Level you can take Levels in one-half The ime required by the old method of the Straight Edge fourth ounce and is easily and quickly attached to to wine. Levelshs onl hu taken areguaranteed to be accurate on a stretched line from one to forty
feet. Besides from m its feet. Besides, from its construction, it can be used as a Pocket Level. and 40 -ft. line. Complete in Leatherette Case. PRICE $\$ 1.00$, Poathrette Case. It is especially adapted for laying out foundations for buildings. It
will do the work no other level will doo. For sile at
JOS. WOODWELL CO., Sole Agents, 201 Wood St., PITTSBURG,PA.

## Drawing Materials

Surveying Instruments
Drawing and Blue Print Papers, Architects' and Builders' Levels Drawing Instruments, T Squares, Triangles, Scales, Inks, etc. Stee and Metallic Tapes, Builders' Levels. Repairing promptly executed.

## Catalogue on Application

${ }^{127}$ Nulton Street Yew York $\quad$ KITFFEL \& ESSER CO.
General Offices and
Factories Hobactories N. J.
11 East Madison
${ }_{813}$ ST. Locust St
SAN FRANCISCO


FREE! FREE! FREE!
Our new catalogue of Civil Engineers' and Surveyors' Instruments Architects ${ }^{\prime}$ and Draughtmen's Material,
Draughting Room Furniture, Blue Draughting Room Furniture, Blue and
Black Print Papers, is now ready for Black Print Papers, is now ready for
distribution, and will be mailed on re-
ceipt of request.
A. S. ALOE CO., : 511 OLIVE STREET,

ST. LOUIS, MO.

## 

## SCHMIDT'S PITCH MEASURING RULES

$\mathrm{R}^{\text {OOF FRAMING is easy, accurate, and quicker with these rules, no figuring or setting, }}$ Use it tike a common rule. The pitch on one foot run is divided into 12 inches of pitch. measure for hip and common rafters. The rules are from 1 inch rise to a foot run and up. two different measurements on each. Roof framers should not be without them. They are time savars.

Price per rule $\$ 3.00$ postpaid
R. D. SCHMIDT 738 Wid


## ZIMMERMAN <br> IRON BASE

heat. Have done with this the sun cannot and have your architect specify nuisance IIMMERMAN BASE. It separates the he column the floor and also ventilates column shaft, preventing columns from checking and opening
SYRACUSE CORNER BLOCK FACTORY,
SYRACUSE, NEW YORK

## RELATIVE TO THE COCOMO CHISEL.

In any line of manufacture the competitors at the bottom are always numerous. As the quality ladder is climbed, the competition gets less and less. The P. H. Learner Company of Kokomo Ind., claim that they have very little competition in the matter of high grade chisels. It is an axiom that "No product can be better than the responsible head of the manufacturing concern." No one who has ever come in contact with Mr P. H. Learner can doubt his ability to produce a chisel of merit Coming from good thorough-going German stock, with a natural aptitude for the handling of steel, and having given a persistent study and application to the securing of the best results, he is equipped in a peculiarly efficient way for obtaining results in this line of endeavor. In conversation with Mr. Learner we learn that he emphasizes the excellence of their chisel from the tip to the edge. They claim that they spare no expense ni the matter of securing the best crucible steel of special analysis, most experienced workmen and most approved processes. They emphasize the fact of the proper temper, neither too hard nor too soft, and the special shape of the blade. They are proud of their pattern of handle which is shaped so as to give the maximum amount of comfort to the user. They also claim that the pattern and special grinding given to their beveled chisels, gives a lightness in the hands of the mechanic without affecting the strength of the chisel. Mr. Learner states that he can make a chisel for half the price that would look the same. He claims that it is what one can't see in his chisel that makes it so good.

An excursion through the Learner plant is of considerable interest. On its journey to a Cocomo chisel the bar steel is first taken to the shears and clipped in lengths of 2 feet each. These pieces are then placed in a forge and heated. The one end is then formed so as to receive the socket, if it is to be a socket chisel, or shaped into a tang if for a tang chisel. The socket is made of seamless steel tubing formed in a cone shape so as to telescope over the especially shaped neck of the steel bar This embryo chisel is then returned to the furnace, heated to a welding temperature and is thoroughly welded together, after which the shear is again used, leaving a sufficient amount of steel which with the socket will make a tool of the proper length when it is urned out. A careful inspection is then made in regard to the welding.

In department 2 the tool is taken through another set of dies which forms the piece of steel into the proper shape and length This process is technically known as plating. The smoothing opera tion is given by the socket being passed through another set of dies after it is heated. At this point the tool is brought to another shearer and clipped to the exact length. This is followed by straightening and a careful inspection. The chisel is then heated to the proper temperature and hardened in oil and after this given a lead bath. By means of a pyrometer this lead bath is kept at the proper degree of temperature so as to give the steel the proper temper. The pyrometer is infallible, so that it is impossible for the temper to be either too hard or too soft. At this stage every chisel is thoroughly and fully tested and then inspected with the greatest of care

In department 3 the chisels are ground by experienced men on fine grain Huron grindstones. From there they travel to the edging machines and are properly edged so as to be sure and have every one of the proper width. They then pass back to another set of grindstones and have the cutting bevel put on them. Before being allowed to pass through the special beveling process they are again inspected and tested.

In department No. 4 the socket or tang is ground, when after another inspection they are passed into the polishing room where the polisher passes them over four grades of emery wheels. They are then returned to the grinding room where they are sharpened and where another test and most rigid inspection is given.

In department 5 they go into the hands of the polisher, where they are finished by being passed over three finer wheels.

On arriving in the stock room they are given their final examination. If the chisel passes this inspection it is oiled with pure olive oil, handled and then given its name, as an emblem of high degree, after which it is carefully polished with a soft woolen cloth and air slacked lime. After being polished the steel is never touched by the hand. It is packed in anti-rust paper and boxed for shipment.

## COAL CHUTES.

Wherever it is necessary to put vegetables or fuel in a cellar, there is the need of an up-to-date chute to get them in.

The purpose of the chute is not only to get the materials in, but to do it without damage to the materials, the chute, or the surrounding property. Where there is no chute, broken glass, damaged frames and wasted materials are sure to result. Frequently the window, through which material is taken into the cellar, is left open or unlocked over night, an open invitation to the thief or other undesirables to come in. The damages to the sash frame and building will soon amount to the cost of a first class chute, while the annoyance attending the old style methods should settle the question at once in favor of an up-to-date chute.

The Roenius Chutes, as manufactured by the Grand Rapids Foundry Co., Grand Rapids, Wisconsin, are made in three styles and 7 sizes. Some prefer a square chute, while others want a round one. Others want a little light through the cover. The manufacturers claim that in the six years they have been in business they have shipped chutes to every state in the Union and that their thousands of customers are all satisfied with them. It will be well for every prospective builder to have their circular, which gives far more information than can be crowded into these few lines.

## STEEL SCAFFOLD BRACKETS.

In the erection of a building there is a great quantity of material and work furnished which does not appear in the finished work. There are runways over the soft ground, forms, cribbing and centering for the concrete, temporary closures for the windows, etc. Not the least is spent on scaffolding merely to hold the men and material in place until their work is done. With some contractors no effort is made to economize on this point, the safety of the men being the first consideration. With others, an attempt is made men being the first consideration. to save the poles, braces, etc., of which the scaftold causing conbut they do not always come apart without splitting, causing con-
siderable loss of material. Others use built up wood brackets, heavy and cumbersome, occupying valuable space whether in use or in storage.

The American Steel Scaffold Company, 501 Woodward avenue, Detroit, Mich., has recently placed on the market a folding scaffold bracket, designed to take the place of the temporary constructions heretofore relied upon. Being made throughout of steel and designed to carry a load of $1,500 \mathrm{lbs}$., far in excess of any which is apt to come on it, it seems reasonable to believe the statements of the manufacturers that their use will save the cost of many brackets on each job. As they are easily folded when not in use and occupy a very small space, there is no occasion for leaving them around when not in use.

A scaffold of this description has many uses and advantages in all of them. Only one small hole through the sheathing is required, and whether the sides are shingled or whether branded, the scaffold can remain until the sides and cornice are finished.

Contractors who have used this scaffold enthusiastically endorse it. Contractors and carpenters should have the circular describing these scaffolds in detail. The American Steel Scaffold Company is always glad to advise prospective purchasers regarding teh use of these scaffolds or their adaptability to any certain class of work.

## THE BAND SAW IN THE SHOP

The most important machine in any wood shop, especially the Carpenter, Contractor or Builder. It follows, therefore, that the Band Saw purchased for use in such a shop must be chosen for its Baility to stand up to hard work and of all kinds day in and day out. Nothing is more annoying than to have a machine which will break Nothing is more annoying the middle of a rush job.

Undoubtedly, the best all around Band Saw now made is the y \& Egan Co., No. 50. W. S. Milne, the large chair manufacturer of Cleveland, Tenn., says that after seeing one of these machines in operation in another factory he immediately decided to purchase a Fay \& Egan No. 50 the next time he needed a machine of this type. He got such excellent results from the first that he has since purchased eight more, now having nine of these tools running in his factory.


The illustration herewith shows one of the latest improvements th this machine the iron doors over the ower wheels, eliminating any chance of the operator getting caught in the lower wheel.

The success of this machine is attributable primarily to Fay \& Egan's Patented Knife Edge Straining Device. This device is so sensitive that it will compensate for even the smallest chip sticking to the blade or rim of the wheel. Broken blades are practically unknown where this strain is used, the sum saved in this respect alone amounting to quite a little in a short while.

This Patented Strain in connection with the Solid Lower Wheel permits the use of a thinner blade at a higher speed than was ever known before, increasing the quality as well as the quantity of the work.

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

Further information regarding this Band Saw may be obtained by addressing the manufacturers, J. A. Fay \& Egan Co., 327-347 W. Front St., Cincinnati, Ohio.


> With Its Back to the
> Wind and the upward doping opexing in the bowk taking the full force of the wind, the Iwan Volcano Revolving Chimney Top makes a sure draft on the chimney Mountings can be bought separately and the hood and vane can be made in your shop according to patterns furnished free with all iron mountings. Sizes 6 to 12 inches.

> Prices and catalog sent promptly.
> Iwan Brothers, ${ }^{1509 \text { Prairice }}$ Avere South Bend, Ind.


## ELEVATORS

Dumb Waiters, Carriage and Store Elevators, Sidewalk Hoists, etc. MECHANICALLY PERFECT
State your requirements, giving capacity, size of platform, Lift, etc.., and
we will name a money saving price on your exact needs. Write today,
we will name a money saving price on your exact needs. Write today.
SIDNEY ELEVATOR MFG. CO.
SIDNEY, OHIO

Improved Quick and Easy Rising Steam Electric and Hand Power Safety
ELEVATORS
and Dumb Waiters, Automatic Hatch Gates send for circulars
KIMBALL BROS. CO., Council Bluffs, Iowa

## 1000 Pounds Easily Carried on THE ASHLAND Folding Scaffold patioitiou <br> Strongest and Best Bracket made. Instantly adjustable to any spaeed studding or pitch of roof. Can be weed on any kind of siding. No studding or pitch of roof. Can be uese on any, kind of siding. No pind or bolto used in adjuting. No boring holes in siding. Savce time pins or boits used in adjusting. No boring holes in siding. Saves time and money on every job. Speail Diacount for Eirst Order in Eaeh Looality. Write for Circular N and Prices. <br> Ashland Folding Scaffold Co., <br> 

## "Diamond N" Expansion Shields

Have increased holding power on account of the corrugated ribbed exterior surface. Securely clamped together without the use of springs or wires.
A better shield at the same price.
DIAMOND EXPANSION BOLT COMPANY
90 West Street, corner Cedar,
NEW YORK


## CALDWELLSASH BALANCE

Does away with weights and cords and VASTLY

## Me durable.

Makes sashes work perfectly.
Permits greater window space in new work, as box
mase not necessary.
May be applie
sashes or frames.
Write for circular to the
Caldwell Mfg. Company, $\underset{\substack{\text { 2Jones } s \text { trreet } \\ \text { Rochesert, } N . Y \text {. }}}{\substack{\text {. } \\ \hline}}$


## PLUMBING AND STEAM GOODS.

The 1911 catalogue of B. Y. Karol, 768-772 West Harrison street, Chicago, shows a complete line of fittings for the purposes mentioned. With an experience of twenty years, Mr. Karol has seen a remarkably growth in the plumbing goods industry and has had much to do with raising it to the high standard it now holds. A large stock of goods enables him to ship promptly and his long experience would indicate that an order would be promptly and properly filled.

Mr. Karol, while supplying all the standard plumbing goods, supplies and accessories, also sends out complete outfits of various combinations of fixtures. Many times a considerable saving can be made by uniting several fixtures in a set, besides giving à more harmonious appearance to the house. One of the many combinations which he has on hand is shown in the cut herewith, and intending purchasers should write him when in the market for goods

## CEMENT BRICK MACHINERY.

In the search for materials calculated to insure permanence, fireproof qualities and good appearance, cement is a most important factor. The durability of cement products in almost any of its forms is well known, and its fireproof qualities are a matter of record. When the artistic design and appearance are considered, however, there is a great variety of expression which concrete and cement are capable of expressing. Possibly, in no material is there a greater range. We get the massive effect of the monolithic structure the rough appearance from the rough cast on metal lath, cut stone effects at a fractional cost from block construction, etc. For certain conditions each construction may be adapted, but for the best appearance under nearly all conditions, nothing equals the standard size cement brick. The clay brick has held its size for so many centuries with comparatively little variation in size that it truly represents the ideal form of architectural expression. The advantage of cement bricks over clay bricks are numerous and apparent. There is a uniformity in size, color and texture which is hard to obtain in clay. For the same quality, the cement brick has the advantage in cost. For moulded courses and decorations, the cost of clay brick is practically prohibitive, while the cost in cement brick is no greater than common brick.

In the manufacture of cement brick, however, great care must be taken to obtain the best results. Many of the machines now on the market are defective mechanically and a first-class product is impossible on them. The Raber \& Lang Manufacturing Company, of Kendallville, Ind., make a machine which they claim overcomes all the objections of the most critical. They claim the machine has a capacity of 12,000 brick per day when operated by one man with two assistants. This reduces the cost far below the cost of common brick, and there is no delay waiting for them. A copy of their circular should be in the hands of every cement contractor, that he may realize the opportunities in the business. A postal brings it.

## FOX UNIVERSAL TRIMMERS.

Pattern Making, Cabinet Work, Joinery, Carpentry, Picture Framing, and many other trades require accuracy, and at the same time speed. Where a perfectly plane surface on either hard or soft wood, at any given angle from any other face is required, a machine of the trimmer class is practically indispensible.

The Fox Universal Trimmer was designed by a pattern-maker, having the exacting requirements of that trade in mind. The improvements made from time to time to the original design, as suggested by its use in other trades, makes the name "Universal" particularly significant. The trimmer is built upon the principle of a shearing cut, and consists of a bench somewhat similar to a mitre box, on which the material may be fixed at any angle. A knife shearing against the point of a gauge, which is made to swing in the arc of a circle, cuts or "trims" the exposed surface to a perfectly plane surface

The manufacturers of the Fox Universal Trimmer call attention to two particular features of construction.

First-Pivoting the edge of the gauge in such a manner that the shearing edge of the gauge always remains in the same position in relation to the cutting edge of the knife, no matter at what angle the gauge may be set.

## Brick Mantels s쓰Nace Brick

Brick Mantels Made of Really Red Red Pressed Brick from BRADFORD'S

Peculiarly Warm Colored Shale. A1
Standards, Romans, Ornamentals in all
shapes, Circle Brick, Pilasters, Panels, etc.
Directions for setting the Complete Mantel are so explicit that the assembling is simple, resulting in Fireplaces at once satisfying to good taste, everlasting in material and at a cost acceptable to the home builder.

## BUILDERS AND CONTRACTORS

are invited to correspond with us. Get the facts and keep the round profits that are legitimately yours.

BRADFORD PRESSED BRICK CO.<br>BRADFORD, PA.



Syracuse Screen \& Grille Company
north manchester,


That's what the trained man, the expert in his line, hears today from the man that hires.

Training lands the job-training that means high-grade work and a short cut to results. And training wins quick advancement to still better jobs.

The day of the "Jack-of-all-trades" is passed. This is the time of the specialist. No concern can afford to place a high-grade equipment in the hands of low-grade men. Competition forces employers to meet skill with skill.

The business of the International Correspondence Schools is to supply training; to give job-getting and jobbettering ability; to raise salaries.

Every month upward of 400 I.C. S. students write to Scranton to tell of positions secured or bettered-of earnings increased and prospects brightened-through study of I.C.S. Courses. Last month the number was 416. The letters come from every section and from all sorts and conditions of men.

All got the education-the training that enabled them to get work they liked and advance in it. They furnished the ambition and perseverance. The I.C.S. furnished the training

If you wish to make sure of the job you want-there is an I.C.S. way for you. To find out all about it, mark and mail the coupon. Doing so will commit you to nothing, place you under no obligation, and may prove to be the turning point in your career. Dont wait.

## Mail the Coupon Now!

International Correspondence Schools Box 1332, SCRanton, pa.


| Architect <br> Arch'l Draftsman <br> Contracting \& Building <br> Building Foreman <br> Building Inspector <br> Structural Engineer <br> Structural Draftsman <br> Concrete Construction <br> Plumb. \& Steam Fitting <br> Heating \& Ventilation <br> Plumbing Inspector <br> Estimating Clerk | Telephone Expert Bridge Engineer Civil Engineer Surveying \& Mapping Mechanical Engineer Mechanical Draftsman Stationary Engineer Electrical Engineer Electric Wireman Electric Lighting Electric Railways Heavy Elec. Traction | Mining Engineer <br> Mine Foreman <br> Railroad Constructing <br> Textile Manufacturing <br> Chemist <br> Commercial Illustrat'g <br> Bookkeeper <br> Stenographer <br> Advertising Man <br> Window Trimming <br> U. S. Civ. Serv. Exams. <br> Automobile Running |
| :---: | :---: | :---: |

: Name
: caty

- Present Occupation

Second-We apply power to the knife carriage in such a manner that the wear upon the ways is distributed uniformly along the whole surface.

The machines are built in three styles; the style "A" machine being a bench type machine; the style " E " machine being a machine with legs which is intended for pattern shop use, and the style " F " machine, which is to take in the largest pattern shop work, the machine being mounted on a bed having castors, so that it may readily be moved from one point to another. From this it will be seen that the use of a trimmer is not confined to the large shop. The smaller sizes are made for convenient working on a bench, and are easily taken from job to job if the work requires it, and yet they are rigid enough to handle any work coming within their range with perfect accuracy. While no shop can afford to be without at least one of the larger size trimmers, each pattern maker or cabinet maker should have an individual trimmer for his exclusive use.

To acquaint everyone with the scope of work capable with their trimmers, the Fox Machine Company, 26 North Front Street, Grand Rapids, Mich., are sending out a very complete catalogue. An unusual feature in the catalogue is the listing in two tabulated specifications in English measure and metric, the weights, sizes, etc., of the various style trimmers. The list shows a $3 \approx$-pound trimmer making a cut 4 inches high and 8 inches long, and other styles up to a 700 -pound machine making a cut 8 inches high and $241 / 2$ inches long. A prospective purchaser should have little difficulty in selecting the machine suited to his requirement, but if he should have special work to do, the Fox Machine Company will be pleased to assist him in any way possible.

## HOW SHE GOT IT

A little girl was sent by her mother to the grocery store with s jug for a quart of vinegar.
"But, mamma," said the little one, "I can't say that word"
"But you must try," said the mother, "for I must have vinegar, and there's no one else to send."

So the little girl went with the jug, and, as she reached the counter of the store she pulled the cork out of the jug with a pop and said to the astonished clerk:
"There ! Smell of that and give me a quart !"-Erchange.

## The Gale Wall Safe <br> It makes your Valuable Papers, Jewelry and Silver secure against Porch Climbers, Petty Theives, Fire, etc. <br> No Home or Apartment House complete without one. It has a combination lock. <br> WRITE FOR DESCRIPTIVE MATTER TODAY <br> WILLIS MFG. CO., <br> Galesburg, IIl.

## Carpenters and Joiners! <br> This is what you have been looking for. The <br> O. K. BUTT MORTISER and RULE GAUGE <br> The Mortiser cuts out the seat for hinges in soft or hard wood <br> doors, jambs, and similar work. <br> Sample of the Mortiser and Rule Gauge mailed for 75 . cents. AGENTS WANTED <br> S. O. LIPPY, 1144 No. Stricker St. Baltimore, Md.

## LOW GRADE LUMBER AND THE BUILDER

ANEW note or a new tenor of argument has entered into the deliberations of the various retail lumber dealers' associations this year, probably inspired partly by sawmill men, as a result of which there will probably be more low grade lumber than heretofore offered the building trades.

Low grade lumber is getting to be quite a burden to sawmill men, lecause of the desire to clean up their trees closer, makes lots of timber lower in quality, so that the precentage of low grade runs higher than it did. Also the spirit of thrift and economy creates a natural desire to utilize material that heretofore was thrown in the waste pile.

Just how this may affect the builder remains to be seen. From certain angles it looks like a benefit may derive from it that will be divided between the builder, retail lumber dealer, and the sawmill man. Looked at from other angles, it appears as if there is a chance for the builder to have more trouble with his lumber than ever before, because of the injection of low grade stuff into it.

Quite a lot depends on both the intelligence and honesty with which the matter is handled. If the retail dealer figures on handling a lower grade lumber and foists it on the building trades as representing the same old grades, it means trouble and annoyance. The claim is made that some of this has already been done, that some of the dealers use a good grade of No. 3 boards and pass them off as No. 2, and a good grade of No. 2 common framing and pass it off as No. 1.

Things of this kind are to be deplored. If there is a good grade of No. 2 framing that will do in lieu of No. 1 it should be sold for what it is and the price made so that the builder and the lumberman may divide the profit. The same is true of boards.

If the thing is taken up in an honest, co-operative spirit, however, both the builder and lumber dealer may profit by the use of a greater percentage of low grade lumber. In the present day there is a chance to use quite a lot more low grade both in framing and in sheathing if attention is given to it. There are various ways its use may be encouraged. There are lots of short lengths in framing that No. 2 common will do as well as No. 1, and there are occasions where larger dimensions in No. 2 would be preferable to small ones in No. 1. Then in boards for false work to do concreting there is no need for anything but low grade. The complaint is often made that too much lumber is wasted and destroyed in this kind of work. All that is wanted is something that will hold the concrete while setting and here lots of low grade might be used. Also, for storm sheathing and in connection with the use of thin hardwood floors there is a chance to work in quite a lot of low grade by proper cutting and refining. Then in planing mill work there is a chance to trim low grade and refine it for what clear stock is present in it, and there are many opportunities for both the lumbermen and the builders to utilize some of this low grade to their mutual advantage provided they go about it in a co-operative spirit.

No one knows just what spirit the matter will be taken up with, but since the subject is opened up and it is liable to be a matter of experiment it behooves every builder to be on the look-out and be in touch with his lumber dealer so as to know what is what and be prepared to protect himself, or either in cooperation with his lumber dealer, as occasion may require.

## BATH ROOM COMFORT.

The introduction of the Never-split Seat marks a new era in bath room appointments.

The ordinary closet seat depends upon glue alone to hold it together at the joints. Glue loses its adhesive power when exposed to dampness or heat and hence the seat in the majority of homes soon splits and becomes not only uncomfortable but unsanitary. This seat made by Never-Split Company of Evansville, Ind., has a strong steel bolt in every joint in addition to the tongue and groove. In shape and finish, perfection is an adjective that truly describes this modern improvement.
$12^{\prime \prime}$ GALVANIZED WALL TIES For STONE, BRICK and CONCRETE BLOCK WALLS

## Single and Double Width

Samples sent
on request also Folder B.


Above cut shows Single Width Tie Complete, greatly reduced in size.
Wall and Veneer Ties Wall Plugs

## Antacatie

## Why the Buyer of Amatite Never Complains

WHEN a man buys ordinary ready roofing he usually neglects to paint it and after three or four years he comes back to the dealer with a protest. It is human nature to neglect painting roofs.

When a man buys Amatite Roofing he lays it on his building and in three or four years it is still as good as new and does not need any paint. He forgets he has such a roof but no harm is done by that.

There is nothing to neglect in the case of Amatite. Amatite has a peculiar surfacea sort of plastic concrete made of pitch and mineral matter.

This surface is plastic enough so that the material can be rolled up into handy rolls in the usual manner and handled just like any
other ready roofing. When unrolled on the roof and nailed down it presents to the weather a continuous surface of mineral matter and pitch. On this surface wind, rain, storm, heat and cold have little effect. Year after year it looks up to the sky undisturbed and unaffected. It costs nothing to maintain and relieves the owner from all responsibility.

Dealers can improve their business by selling Amatite and buyers make a good bargain when they buy it. The price of Amatite is less than that of most painted roofings of less weight and durability.

Sample free on request. Address our nearest office.

## Barrett Manufacturing Company

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


SIMPLE, SCIENTIFIC SASH VENTILATOR



THEE PHMYIP OAREY MEG. CO. 59 Wayne Avenne, Gincinnati, Ohio 50 Branches

```
FAMOUS FOR DURABILITY
```



DIRECT FROM THE MILL LUIIULII

## SHAW-WELLS CO.

SPOKANE, WASH.
Addross DEPT. L
Please send prices on
Lumber, Sash, Doors and Mouldings
To.
City.
State.
$\qquad$ $\left.\right|_{\text {Oar DIRECT selling plan }} ^{\text {has solved economy for the }}$ has solved economy tor the
man who
No moing to vuilid.
Nore exorbitant hish Half-a-Dozen


Don't be afraid of the freight.
CAR LOAD RATE ON LUM SPOKANE to

| Chicago .... | 52c | $\text { per } 100$ |  |
| :---: | :---: | :---: | :---: |
| Kansas City. | 47c |  |  |
| Fargo | 37c | ${ }_{6}$ | 6 |
| Denver | 33c | 6 | 6 |
| Philadelphia | 85c | ${ }^{6}$ | 66 |



## Johnson Offers Free Samples

S. C. Johnson Q. Son of Racine, Wis., are offering to send to our readers liberal free samples of their tamous wood finishing materials post-paid. This is being done that all of our readers may be familiar with the superior merits of the goods manufactured by this old and reputable concern, who have been wood finishing authorities for 30 years. With these free samples, they will send a copy of the last edition of their book "The Proper Treatment for Floors, Woodwork and Furniture." To get samples and book free all that is necessary to do is to fill out the coupon, addressing to S . C. Johnson $\&^{2}$ Son, Racine, Wis.

## Johnson's Wood Dye

is made in 15 standard shades, as follows:

> No. 120 Fumed Oak
> No. 126 Light Oak No. 123 Dark Oak No. 125 Mission Oak No. 140 Manil Oak No. 110 Bog Oak No. 128 Light Mahogany
> No. 129 Dark Mahogany No. 130 Weathered Oak No. 1311 Brown Weathered Oak No. 132 Green Weathered Oak No. 121 Moss Green
> No. 122 Forest Green
> No. 172 Flemish Oak
> No. 178 Brown Flemish Oak Half Gallons, $\$ 1.50$ each

Any other shade may be easily produced, as each shade may be lightened by adding alcohol and darkened by adding No. 172 Flemish Oak Dye.


# To Readers of National Builder 

Johnson's Under-Lac is a spirit varnish which will not chip, mar or scratch. It is better than shellac or varnish as it can be easily applied and does not raise the grain. Neither is it thick and sticky like varnish -it dries in a half hour. Gallons $\$ 2.50$ each.

Johnson's Wood Panels-In addition to sending tree samples of Johnson's Wood Dye and Under-Lac, we are glad to supply painters and contractors with panels of various woods finished with Johnson's Wood Dye, Under-Lac and Prepared Wax. If you care for a set of these panels drop us a line-and we shall be pleased to send them to you without any obligation whatever on your part. You will find the panels very convenient to show prospective customers and they will assist you in procuring contracts at Good Prices.

Mail the Coupon now for samples, panels and book, 'The Proper Treatment for Floors, Woodwork and Furniture."


## Material Hoists



For Double Platform Elevators SIMPLE, STRONG, DURABLE

The most economical method for elevating building material. Two sizes, 4 and 6 horse power.

Contractors send for Bulletin No. 5 and get our proposition. Also a full line of engines from 1 to 35 horse power.

## Bates \& Edmonds Motor Co. 1146 MILL ST., LANSING, MICH.

## GOODELL MITRE BOX

Made of STEEL - Cannot Break First in Quality and Improvements


Automatic Stops for holding up saw
Corrugated Backs. Graduated Gauge for Duplicate cuts and many other features
If you want the Best you will take no other
SEND FOR CIRCULAR E
G00DELL MFG. CO., Greenfield, Mass.

 inside the building

KEES-GOSSETT $T_{\text {sispuwem }}^{\text {pardiNGES }}$
Try a pair to hang one of your own window screens.

After that you'll always use [and recommend them.

Ask on your letter-head and we'll send a sample set free if you mention your hardware dealer.

BOX 810


Screen swung out to


## G.\&M.Trestel Irons

(Patented Aug. 25, 1903)
Made of best quality malleable iron, it is non-breakable, light and portable.

By removing bolts $\mathbf{A}$ trestle will fold together for convenience in transportation from one job to another or from one room to another. Also for storage purposes no space is lost.
G. \& M. Trestle Irons enable any one with saw and auger bit to set up trestle in 1-5 the time it takes a mechanic to make an ordinary trestle.

No planing required. Timbers $2 \times 4$ in the rough are all that are required.

For Sale By овв ооокет HARDWARE CO.

Established 1872
14-16 W. Randolph St., CHICAGO
Also Agents for the Acme Floor Scraping Outfit, Buck Bros.' Chisels, Barnes Foot Power Woodworking Machinery, Jennings Take Down Squares, Job Pugh Hand Made Auger Bits.
Sendfor our Catalog A of CEMENT TOOLS.

## Samson Spot Sash Cord

made of extra quality fine yarn, and warranted free from imperfections of braid or finish. It can always be distinguished by our trade mark, the Colored Spot. Carried by all dealers. Send for samples and tests.

## Samson Cordage Works BOSTON, MASS.

 Diehl's Separable and
Reversible HingeNo. 20
This hinge is designed for storm and screen doors. The door may be swung at right angles and lifted from its bearings without removing the screws, as the shank slides through the small slot in the upper ear so that it makes it very easy to change from storm to screen doors and from screen to storm doors without removing the hinges. Hinge No. 20 is made of open hearth wrought steel, 14 gauge, and finished in black baked japan or oxidized copper.
A Sample Set of Hinges will be sent upon receipt of 25 cents in stamps.
The Diehl Novelty Company mimporism
Mention National Builder.

## MR. CONTRACTOR

## Look at These Prices

CARPENTER MOUSE


Chain is 63 inches long, fitted at one end with a patent sash cord fastener, at the other end with a lead weight. Price each......30c

## WROUGHT SASH LIFTS


2367. Sash Lifts. Wrought iron bronze plated, per doz. . 15 c 2368. Sash Lifts. Wroughtiron, old copper finish, per doz....15c. 8368. Hook Sash Lift. Steel, dull brass finish, per doz......15c.

## WROUGHT CUPBOARD

TURNS

1496. Cupboard Turns, wrought steel, old copper finish, perdoz. 95 c . 8274. Cupboard Turns, wrought steel, dull brass finish, per doz. 95 c.

## WROUGHT SASH LOCKS


5493. Sash Lock. Steel, antique copper finish, per doz........50c. copper finish, per doz.......50c. steel, dull brass finish, per doz. 50c.

DRAWER PULLS


No. 2330 and 8330.
2330. Drawer Pulls, steel, old copper finish. Price per doz..22c. 8330. Drawer Pulls, steel, dull brass finish. Price per doz.....22c.

INSIDE LOCK SETS

155. Lock Set. Lock has wrought steel front, antique copper finish, electro plated bolts, nickel plated steel key. Knobs and plated steel key. copper finish. Price, per set. 37c.


No. 5755.
5755. Lock Set. Lock has steel front, antique copper finish; brass plated bolts and steel keys. Knobs and escutcheons wrought steel, antique copper finish, per set. . 44c

## FREE

Our illustrated catalog and net price list. When sending for this catalog state whether you are a contractor, carpenter, or material man.

REHM
HARDWARE CO.
1503 Blue Island Ave., Chicago



## Mr. Carpenter and Builder

## Why Not Make Some Extra Money

by inducing your local merchants to modernize their stores? By doing so you will not only make money on"selling thern the rolling ladders that they may require, but also on the shelving that it may be zecessary for them to extend to ceiling or rearrange.
It is only necessary to send us the measurements and we will do the rest. Ship you the ladders complete and ready for use and guarantee them in every respect to be satisfactory.

Write for Catatogue
MILBRADT MANUFAGTURING COMPANY
1442 N. Eighth St., ST. Louis, mo.


## LET US SEND YOU THIS BOOK FOR FIME DAYS FREE TRIAL

Send no money-just mail to us your name and address. Your book will reach you by return mail. Keep it 5 days-use it-then either send One Dollar or return the book.

## Standard Handbook of ESTIMATINGDATA Everg Man in the Building Trade needs it.

READ WHAT OTHERS SAY :
Your Standard Handbook is the best book of its kind ever written.
For all the 30 years I have spent in estimating and building I would not be
without it for twice the cost without it for twice the cost.

Name.
Address
THE BUILDERS' AUXXILIARY COMPANY, 325 Old South Bldg, Boston, Mass.
HARTMANN-SANDERS CO.

"Lock Joint" Stave Columns
Universally Recognized As the leaders in Architectural
Beauty and Quality. Beauty and Quality
When other houses were selling
columns of thin material, becouse they could be sold at less price, we steadfastly refused to cut our quality.
We continued to resist every
effort to get us to cheapen our effort to get us to cheapen our
goods-put in thin materialsacrificing quality and beauty. But we are glad we stood the test, that'swhy weare sellingmore columns today than ever before. Ask for Catalogue "T"- it's
worth having for any Home Builder Worth having for any Home Builder porch material and
Hardwood Columns.
2155 ELSTON AVENUE - CHICAGO, ILL.



Pullman Mfg. Company,

## Pullman

 Unit System Sash Balances(Patent Pending)
FOR NEW BUILDINGS
Cost less and give better service than cords and weights.

Frames mortised at the mill.
Let us tell you about this new and up-to-date hardware item. 10 Allen Street, Rochester, N. Y.

Last a Lifotime and Give Satisfaction to the End!


The Famous Barton Planes and Edge Tools for Carpenters and other workers in wood
Unequaled by any other make for keen, smooth, lasting edges. If your hardware dealer does not handle these Famous Barton Tools and is unwilling to order for you, send direct for catalogue. Be sure to specify Carpenter's Catalogue. A postal will bring it, together with our story Carpenter's Catalogue. Aprost book to those who are satisfied with the best tools only.


MACK \& CO., Sole Makers Brown's Race Rochester, N. Y.

## vaky you SASH CORD usE SILVER LAKE

And insist upon getting it from your dealer. To insure you against substitution, we stamp our name on every foot of our cord. Carried by all dealers.

SIIVER LAKE
SILVER LAKE BRAIDED SASH CORD
Was originated by us, and for forty years has been recognized as-

## THE STANDARD

Established 1869

## 1910 "Standard" Floor Hinges

sell because they are the best type and latest improved, Up-to-Date kind. 1909 automobiles were the best last year, but now they are a "back number." "Ketch" on ? Hardware dealers supply them. If yours don't, WRITE US.
The STANDARD MFG. CO., : Shelby, Ohio


Screen Door

## THE SENSIBLE SCREEN DOOR CATCH <br> A New Iclea

The Sensible is the Catch that catches securely but quietly-prevents the door from warping, eeps out the flies, and reduces the noise of slamming to the minimum. Note the simple adkeeps out the flies, and reduces the noise of slamming to the minimum. actual size. Write for justment. Illustrations in this advertisement show
prices. Sample set mailed upon receipt of 25 cents.

MANUFACTURED BY
R. G. KVinter Manufacturing: Co.




## THE LITHOGRAPH <br> POSTAL WILL INCREASE YOUR BUSINESS

By using Lithograph Postals you convey the natural color effects to the prospective home builder as well as the architectural construction.
This is an entirely new idea for the contractor and builder. It is a very effective way to advertise and create future business at small cost.
Write for free samples.

LOW FREIGHT RATES
On Machinery and Household Effects That's what we cun offer SHIPPERS from points east of the Mississippi River destined to
Interior and Pacific Coast Points by our plan of shipping in CAR LOAD LOTS. Latest maps Interior and Pacific Coast Points by our plan of shipping in CARLOAD LOTS. Latest maps
of any principal western state free on application by addressing Forwarding Department of the TRANS-CONTINENTAL FREIGHT CO.

## 215 DEARBORN STREET, CHICAGO

29 Broadway. New York
625 3rd Street. San Francisco
322 West Sixth Street, Le
305 Main Street, Seattle

## custom FLY SCREENS Our work is far superior to the usual output of local mills and has a style and finish not obtainable from mills and has a style and finish not obtainable from those who do not make a specialty of FINE SCREENS <br> Our screens are made from kiln dried lumber and have waterproof coped joints and the frames are weather-proofed before the finishing coats are applied. <br> Best grades of Wire Cloth, Enameled, Galvanized, Genuine Bronze, fastened "Ironwood" Screen is the cheapest good Custom Made Screen yet produced <br> Intending purchasers may have free by mail sample of woods, finishes, wire cloth and a copy of catalog. Agencies in nearly all finishes, wire cloth and a copy of catalog. Agencies in nearly al large cities. Agents wanted in smaller cities. <br> Spectal Terms to Contractors and Builders. Delivered prices will be quoted. Goods laid Gokr at your railway station

A. J. PHILLIPS \& CO., ${ }^{\text {Lot Rovt }}$ Stroot Fenton, Mich.

28 Years Experionee. $31 / 2$ Acres of Floors

Sencl us Two orrimore Names of persons who are interested in or want to buy Hot Water Heating Plants and we will send you
FREE ANDREWS MINNEAPOLIS ARCHITECTS
FCALE this scale. Back inches are divided into 6,10 $12,16,20$ and 40 parts. $12,16,20$ and 40 parts.
Also free catalog on Also free catalog on
request. Name this request. Name
paper when writing.
ANDREWS HEATING CD. 1188 Hoating Bullding
MINNEAPOLIS, MINN.
 The SELF-SETTING PLANE

## As long as this Ad appears.)

Any dome in this paper is good for one dollar, in payment for a SelfSetting Plane, if sent us with the balance of the list price of a Plane from where our Planes are not sold.
If yout want more than one Plane and they are not sold in your town allow you dealer's discount.
List price of Beech Wood Planes: Smother $\$ 3.25$, Jack $\$ 3.50$, Fore $\$ 3.75$ Jo ner st. Do not say the price is too high until you
try it, then if the Plane is not worth to you, twiec its cost, teturn it at our expense and the
trial won't cost you a nickel Ger theto one on trial now and let the Plane talk for f tself. You run no risk, as this paper guar-
antees we will do as our advertisement says. antees we wil do as our advertisement says,
If you don't want a Self-Settind Plane now, send us a dome and the addresses of ten carpenter friends, no matter where they live, ard we will send you a hard, tough, carpenter's
pencil and circula pencil and circulars.
Gage Tool Co. nivenem


## RICHARDS -WILCOX trolley hangers

for that garage job. We'11 solve your problems in warehouse work, too. Tell us your needs, get catalog and mention name of your hardware dealer.
Richards-Wilcox Mfg. Company Aurora, Illinois



The Excelsior Dumb Waiter

## Sent complete to a nail $\$ 1050$ Knocked down, ready to erect

Self-Retaining Machine. Hardwood Car. Ropes, Guides, Weight, Lumber and Hardware. No splicing necessary. Explicit working directions sent with every outfit. We sell direct to the consumer, and give an up-to-date Waiter for the price of an inferior one. Send for Descriptive Pamphlet.
R. M. RODGERS \& CO. 175 Washington Ave., Brooklyn, N. Y.
$\xlongequal{\text { THE "E }} \mathrm{=}$ Z=way" SCREEN HANGERS
never allows screen to bind or stick when hungalways fit snug to biind stop
Everything Done from the Inside of the Building


## Wood's Key to the Steel Square

Hias been tried by thousands of Builders and not found wanting. It is a wonderful inatructor as to cuta and bevels for all kinds of work.
Made of celluloid and put up in
aeat leather case of pocket size, so that it can readily be carried on
the job. It is a snap at our low price of $\$ 1.50$.
Send your order at once and It will be shipped prepaid to your address

HODGSON BOOK CO. 358 Dearborn St., Chicago

Dayton Keyless Locks are the Safest and Most Convenient Locks for the Home
d They are handsomely made in different finishes - cannot be picked-are easily and instantly opened by simply touching the night sentinel as shown here.
I. Architects, contractors and carpenters will find them money winners - meeting every want in locking and opening doors.
and giving absolute protection.

## SALESMEN WANTED

I Let us tell you about them-also about our pad-
lock having 38,005 combinations. Write today.
$\bar{\square}$
Dayton Keyless Lock Co. 804 U. B. Bldg. Dayton, Ohio

THELE 'EUUREKKA" SPIRAT, SCRREKKDRRIVER

## Miller's Two Minute Lever Lock Mortiser

Chisels the opening for Locks and is the greatest time and labor saver

One builder wrote us last month: "You may expect an order for 3 machines as the carpenters are going crazy about my machine. The more I use it, the better I like it."
THINK THIS OVER, MR. CONTRACTOR AND BUILDER
Our patent double edge, side cutting chisel can cut more wood, four times more rapidly and $100 \%$ less exertion than any boring bit. Mortise to be of the same size.

## MILLER'S TWO MINUTE LOCK MORTISERS

are sent on trial to any reliable contracter and builder. Write for circulars and order now for spring work.


We also make a Butt Mortiser and Rule Gauge which cuts out the seats for butt hinges in soft or hard doors, jambs and similar workwhich we will send you postpaid for 75 cents.
A. W. MILLER MFG. CO.

Nevada Building, CINCINNATI, 0HIO $\underset{\text { WIVERSIDE }}{\text { Wester }}$

DON'T PUT SASH WEIGHTS IN YOUR WINDOWS-THEY ARE OUT OF DATE

## тне "AUTOMATIC" SASH HOLDER

is better and cheaper, more convenient, Iess perplexing, easier to put in, more
reliable, more durable, more satisfactory. The "Automatic" Sash Holder is the new modern, up-to-date device that dispenses with cumbrous sash weights, kinking cords or ribbons, useless weight pockets, misfit pulleys and re-
luctant balances, and saves all the time, labor and expense of fitting them in place.
Architects are specifying them, Contractors and Builders are buying them. Sash and Planing Mills are providing for them, Prevent rattling and permit the window to be moved up and
down with ease. Held it sof down with ease. Hold it safely at any point desired. Sample sent on request
Sold by hardware dealers or direct from us. Correspondencesolicited. Representatives and
side line travelers wanted all over the world. AUTOMATIC SASH HOLDER CO. 279 Broadway, New York City.


Style—Strengith—Safety


For that new Store Front specify
the Petz Bar, and see that youl the Petz Bar, and see that you get
it. Not only beautiful and strong, but you can install it without fear of breaking the glass, which hap
pens so often with some bars. pens so often with some bars. The Petz System is hignly recom-
mended by leading architects and insurance experts. It gives per feat ventilation and is quickly and easily installed. Why not write today for our booklet, "Modern Store Front Con-
struction," illustrating and de scribing Petz Bars with opinions of
prominent users? Address
$\square$

\section*{You are Looking for} | Information |
| :--- |
| on Concrete |

Every Architect, Contractor and Builder should have a copy of

## Concrete and Reinforced Concrete Construction

By HOMER A. REID

200 working drawing's of bridges, bridge piers and culverts; 60 working drawing's of sewers, water mains and reservoirs; 30 working drawings each of retaining walls and dams; 200 working drawing's of buildings and foundations, including shops, roundhouses, etc. Every structure illustrated is described, the method of construction is explained and where possible the cost is given. There are chapters telling how to compute girders, arches, columns, tanks, bins, walls, conduits and chapters on proportioning, mixing and laying concrete, on doing concrete work in freezing weather, on facing and finishing concrete, on waterproofing concrete, on the physical properties of concrete, on cement testing and on concrete block manufacture and construction.

This book contains more text paǵes, more drawings and more tables of test data on concrete and reinforced concrete construction than any other book in the world. It has more new mattermaterial never previously published. This work is a combination of several books in one; it is complete, up-to-date and original. No other book on concrete contains onetenth as much of the very latest data on tests, theory, and practice. The cost to publish this book has been more than double the original estimate, but the price will for the present remain at $\$ 5$ net postpaid. Order now.

HODGSON BOOK CO. PUBLISHERS
358 Dearborn Street
CHICAGO

## New Books for Building Mechanics

MODERN PLUMBING ILLUSTRATED. By R. M. Starbuck. This book represents the highest standard of plumbing work. It has been adopted
and used as a reference book by the United States Government, in its sanitary work in Cuba, Porto Rico and the Philippines, and by the principal Boards of Health of the United States and Canada.
It gives connections, sizes and working data for all fixtures and groups of fixtures. It is helpful in demonstrating and in figuring work. It gives the mecianic quick and easy access to the best modern plumbing practice. Suggestions for estimating
plumbing construction are contained in its pages. This book represents. in a word. the latest and best up-to-date practice, and should be in the hands of every architect, sanitary engineer and plumber who wishes to keep himself up to the minute
on this important feature of construction. 400 octavo pages, fully illustrated on this important feature of construction. 400 octavo pages, fully illustrated by 55
full page engravings. Price.....


STANDARD PRACTICAL PLUMBING.
By R. M. Starbuck.
A complete practical treatise of 450 pages covering the
subject of Modern Plumbing in all its Branches, a large subject of Modern Plumbing in all its Branches, a a arge
amount of space being bevoted to a very complete and
pactical treatment practical treatment ong the subed to at of Hery Homplet Water Supply
and Circulation and Range Boiler Work. Its thirty and Circulation and Range Boiler Work. Its sthirty
 PRACTICAL STEAM, HOT-WATER HEATING and Ventilation. By A. G. King.
This book is the standard and latest work published
on the subject and has been prepared for the use of all engaged in the business of steam, hot water heating, and ventilation. It is an original and exhaustive work. ielis how to get heating contracts, how to install heat-
ing and ventilating apparatus, the best business methods to be used, with "Tricks of the Trade" for shop use. Rules and data for estimating radiation and cost and such tables and information as make it an indispensable work
for everyone interested in steam, hot water heating and ventilation for everyone interested in steam, hot water heating and ventilation. It describes
all the principal systems of steam, hot water, vacuum, vapor, and vacuum-vapor heating, together with the new acceleratedl systems of hot water circulation, including chapters on up-to-date methods of ventilation and the fan or blower system of
heating and ventilation. 367 pages. 300 detailed engravings. Price....... $\$ 3.00$ CONCRETE CHIMNEYS, SLATE AND ROOF TILES. By A. A. Houghton The manufacture of all types of concrete slate and roof tile is fully treated. Valuable data on all forms of reinforced concrete roofs are contained within its pages.
The construction of concrete chimneys by block or monolithic systems of is fully illustrated and described. A number of orramental designs of chimney construc
tion with molds are shown in this valuable treatise.
50 Cents POPULAR HANDBOOK FOR CEMENT and CONCRETE USERS. By Myron H. Lewis This is a concise treatise of the principles and methods employed in the manufacture and use of
cement in all clases of modern works. The author has brought tonether in this work, all the alient matter of interest to the user of concrete and its many in ivesified producte The matter in presented in logical and systematic order, clearly written, fully illustrated and and free from


A practical work treating on a process, which has heretofore been held as a trade secret by the few work. The process of molding concereste will mand every and any elass of or namental is of the utmonest practical value posese ing the manifold advantages of alow eost of molds, the ease and rapidity of operation, perfect the work without attention and the eazy and increased strength of the concrete, perfect curing of
 CONCRETE WALL FORMS. By A. A. Houghton.

A new automatio wall clamp is illustrated with working drawings. Other types of wall forms,
clamps, separators, etc., are also illustrated and explained....................50 Cents CONCRETE FLOORS AND SIDEWALKS. By A. A. Houghton.

The molds for molding squares, heragonal and many other styles of mosaic floor and sidewalk
blockss, are fully illustrated and aexplined. CONCRETE SILOS. By A. A Houghton.

Complete working drawings and specifications aregiven forseveral styles of concrete silos, with illustrations for molds for monolithic and block silos. The tables, data and information presented in
this book are of the utmost valuein planning and constructing allforms of eoncrete silos. 50 Cents
MOLDING AND CURING ORNAMENTAL CONCRETE. By A. A. Houghton.
The proper proportions of cement and aggregates for various finishes, also the methods of thoroughly mixing and placing in the molds are fully treated. An exhaustive treatise on this
subject that every concrete worker will find of daily use and value............ 50 Cents

Any of these books sent prepaid on receipt of the price. address NATIONAL BUILDER, Pontiac Building, CHICAG0, ILLINOIS

##  <br> 

## Send for Booklet Called "Tools That Last"

## OUR "CHISEL" GUARANTEE

We guarantee that our chisels will hold their edge all day with one sharpening, even if used on quartered oak across the grain.

Chisels look simple, but there is no tool of which such hard work and varied service is pequired. Recognizing this we have given the choice of the steel, regardless of cost, and the design of these chisels, the most extensive study and experimentation, and in their manufacture the greatest care and highest order of skill is employed.

To further increase the number of carpenters who insist on having B. M. Co. Chisels we will sell direct to readers of the National Builder, express prepaid, any chisel or set of whisels with privilege of returning after ten days trial if they do not prove to be the BEST EVER USED.


## BEVELED EDGE BUTT CHISEL



SOCKET BUTT CHISEL

Can be wasted through a lack of knowledge in knowing where to spend it economically. Our enormous purchases of Bankrupt
Stocks, Sheriffs' and Receivers' Sales make it possible for us to qnote prices that mean a positive saving to you of from 30 to $50 \%$.

> LUMBER ROOFING HARDWARE

OUR STOCK mandur faticaly yery high grade merchandise bought by us at vartout sales is offered high grade merchandise bualn less than the original cost of pro-
to the public at prices usually linal duction. We offer an excepitional opoortunity to those
now, so send us a trial order. This will convince you.

## GASOLINE ENGINES

Equip Your Carpenter Shop with the Most Economical Power Knownto Modern Science
The latest and most modern types ever placed before the buying public. Economical both in price and consumption of fuel. Will public. Economical more horse power for every gallon of gasoline used than any other Engines in the market today. Brand new direct from factory.



Duty Cosedine Ensines compared with any of with the greatest care and every mechanical
detail is carefully provided for. Best Engine for all around work on the farm and in the
factory Most popular Engine we handle, and continuous service. The 8 horse power is
large enough for the ordinary work on the
farm, also for elevators, factories, etc. The




GOLD MEDAL ROOFING


STEEL ROOFING


Complete Bathroom Outift us listratad $\begin{gathered}\text { nily } \\ \$\end{gathered} \$ 37.50$

## Price Wrecking Opportunities

 MODERN HEATING SYSTEMS
In offering to the public our "PERFECION BOILER AND MEATING SYSTEM"
We are confident that we have reached the ACME OF PERFECTION and
have solved the question of Heating your Home or Factory for all time to come.
Our Heating Systems are the result of tests, experiments and scientific research
conducted by expert Heating Engineers and we guarantee them to HEAT YOUR BUILDING

|  |  |
| :---: | :---: |
| COLD MEDAL ROOFING |  |
| - |  |
|  |  |
|  |  |
| \% |  |
|  |  |
| $\square$ |  |
|  |  |
|  |  |
|  | \% mimman in |

## SAVE 30 TO 50\% cet our pricas Roofing, Tanks, Pipes, Plumbing and Heating Goods. Our catalog shows over 50,000 bargains, in almost everything you use or buy daily. You need this catalog. <br> PLUMBING heating WATER SISTEM

## PLUMBING <br> $\square$ HEATIMC

# IT’S A PLEASURE TO USE FNNE SAWS 



## Saws That Hang Just Right - That Run Easiest - That Cut Fastest That Saw to the Mark - That Take a Sharp Cutting Edge and Hold It

We have made a life-long study of saws. Long before many of you were born, E. C. ATKINS \& COMPANY were already making saws. We know better than anybody else what the high-class mechanic wants in a saw, and we know how to make saws that give satisfaction.

## Is This the Kind?

Do you want a saw that sharpens easily, that holds its tension, that will receive a very sharp cutting point and hold it? Do you want a saw that cuts fast and easy and true and that hangs just right, so that it will run with the least exertion?

Then you should by all means use an ATKINS SILVER STEEL SAW because they will do these things for you.

## Guarantee

These are rather broad statements to make, but we back them up by the broadest possible guarantee. ATKINS SILVER STEEL SAWS are not only guaranteed to be perfect in material and construction, but we guarantee them to give perfeet satisfaction. Listen to this: If your ATKINS SILVER STEEL SAW, for any reason, does not cut faster, run easier and hoid its edge longer than any saw you ever used-take it back to your dealer and get your money back or a new saw. No argument, no proof is necessary; don't
hesitate-just take it back and get your money, that's all. If your dealer even hesitates, show him this advertisement and, if necessary, let us know. We'll see that you get satisfaction. Can we make it stronger-can we give you better protection?
The reason we can do these things is because we know all about our saws. We make them ourselves.

## SILVER STEEL

SILVER STEEL is the finest material that nas ever been used in saw blades. It is made of virgin ore and contains the very highest ingredients and is manufactured under an exclusive formula. It is as fine as the steel that is used in most high grade razors, and when we tell you that it will receive a sharper cutting edge and hold it longer than any other steel, we know what we are talking about.

## Taper Grinding

ATKINS SAWS are the only saws which are ground on an actual taper from the tooth edge throughout the entire blade toward the point on the back. They are diflerent from the e thin back saw which is simply ground of along the back, while ATKINS SILVER STEEL SAWS are ground on an actual taper throughout the entire blade.

## The Handle

Many of our SILVER STEEL SAWS are made with the old style straight across handle, but most high-class mechanics prefer the Perfection Handle because it is scientifically constructed and saves the wrist and saw arm.

Go to your dealer and ask him to show you a genuine ATKINS SILVER STEEL SAW and note these things for yourself. If your dealer does not carry them in stock, he will order for you from his wholesale house. Insist on an ATKINS SILVER STEEL and see that our name is on the blade.

OUR FREE OFFER-If you will send us ten cents in currency or stamps we will forward you, free of charge, a high grade carpenters' nail apron, also our Saw Sense book, illustrating and describing our most popular saws, together with a carpenter's time book and wage scale, also a great deal of useful information in regard to High Grade Saws. Address

## E. C. ATKINS \& COMPANY, Inc.


[^0]:    PASTE THIS DOME ON LETTERS
    THAT YOU WRITE ADVERTISERS.
    IT WILL HELP.

[^1]:    PASTE THIS DOME ON LETTERS
    THAT YOU WRITE ADVERTISERS
    IT WILL HELP.

[^2]:    Na,ne.

