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

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The five cuts illustrated on this page will give you a fair idea of the construction of the Famous Universal Wood Worker, the only machine that has ever been placed on the market which will fill all the requirements of the contractor and builder. This machine was brought out after many years of practical experience in the contracting and building trade, and has all of the latest, up-to-date attachments useful for all kinds of work which needs to be done on all different kinds of jobs. In the surrounding cuts you will see the machine as a band saw, boring machine, jointer, two side molder, single end tenoner, planer, molder and matcher. We can also furnish with this machine a hollow chisel mortising attachment, which is one of the most useful attachments on this machine. If you will write us and state the kind of work you wish to do, we can equip you with a machine which will be successful in every way, and will give you an iron-clad guarantee with each and every one of these tools, that they must do as we represent, or we will refund you your money. We can furnish you a great number of testimonials from contractors and builders who are now using this machine, if you wish them.

Do not fail to install one of these machines for your summer work.

Write us at once for catalogue B, giving you a complete description of the Famous Universal Wood Worker, explaining all of the different attachments which we can furnish with this machine, some of which are shown on the cuts above. If you are a contractor or builder you cannot afford to do without a tool of this kind, the only thing on the market which will save you from 15 to 20% on every job you do and pay for itself the first season.

We should also be pleased to send you one of our catalogue E, illustrating and describing the machines shown in our general catalogue, consisting of Band Saws, Saw Tables, Jointers, Shapers, Planers, Boring Machines, Turning Lathes and Saw Arbors.
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(Patent applied for.)

Distinctive Features

Adjustment of Handle to height of operator.
Adjustment of Blade to any vertical or lateral degree.
Adjustment of Weight over Blade anywhere from 15 to 50 lbs.
Adjusted Weight over Blade permanent; not governed by pressure upon the handle, insuring a uniform cut, absolutely free from "chattering."

Any workman can do, with ease, more and better work than with any other mechanical scraper, and several times what can be done by hand.

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NEVER BREAK

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

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Send for the 1909 price list of our 10 different priced machines, weighing from 78 to 112 pounds.

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Sash and Door Holder
A Practical Tool for Practical Men

Will hold any Sash or Door in an absolutely rigid upright position.

WILL NOT SLIP. EASILY ADJUSTED.
ALWAYS READY. FITS ANY TOOL CHEST.

The "Dutro" will not mar any highly finished door or floor, as the jaws and feet are rubber lined. Will pay for itself in the saving of broken glass alone or in fitting and hanging 25 doors.

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and Handles are of malleable iron with an inserted anvil of hardened steel and jaw of the same material. It is so constructed that Saws of any width can be set and the guide is adjustable so that the amount of set can be easily adjusted. This Saw Set is of sufficient strength and power so that Cross-Cut Saws can be set with it. Finished in Dull Nickel.

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**Toolsmiths**

GREENFIELD, MASS., U. S. A.

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Combined Level and Grade Finder

An instrument with which at one glance you can get the true slant on any line or grade either in degrees, inches, hundredths of an inch, or at the same time, and will at once give the exact distance need to plumb up a true level.

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

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

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

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

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**PARKER VISES**

MADE ESPECIALLY FOR WOOD WORKERS

FOR SALE BY DEALERS

SEND FOR CATALOG

CHAS. PARKER CO.

MERIDEN, CONN.

**SELF-SETTING PLANE**

See December number of this paper pages 261, 320 and 322 for facts. No plane like it. Inexperienced men can use it. A child can set it. It sets itself. Works easier, better, quicker. Saves price every month used. Shaking knot won't move bit. Five seconds does it. 4000 cuts per minute. Both set screwed together. Both set when dropped into place. Cap stationary when bit moves up or down. Bit warranted not to stand knots or anything, else to user's satisfaction. Trial cost nothing, if returned at our expense. Should be in every shop, for every carpenter and machinist - don't force him to use the old style plane. He deserves the best. Give it to him if you don't want it for yourself, then return it if you want to. Circumcis and a carpenter pencil free on receipt of addresses of ten or more plane users. Give for a plane now and return it if you don't like it. Circumcis and a carpenter pencil free on receipt of addresses of ten or more plane users, and the name of this paper.

GAGE TOOL CO., Vineland, N. J.
Coming right down to the economy question Clincher Lath has got everything beaten.

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

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

The American Rolling Mill Co.
MIDDLETOWN
OHIO

**COMPO-BOARD**

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

Northwestern Compo-Board Co.
4800 Lyndale
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Be sure that the cord you buy has SAMSON AND THE LION on the label, and that the braid is marked with the COLORED SPOT. You may be sure you'll get the best.

WE'RE GLAD TO SEND SAMPLES AND FULL INFORMATION.

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A Bit Of Utility

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

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

Unequaled for Delicate Work

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

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

The Progressive Mfg. Co.
Torrington, Conn.

We Want You

to know us; to get our catalogs and see what we have to offer in goods and prices. Get a catalog and look it over. It will put you under no obligation and you will not be bothered by a lot of advertising matter that is no good to you

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Number 371 WOODWORKERS' TOOLS—Contains tools for the cabinet maker, car builder, carpenter, carriage builder, cooper, draftsman, furniture maker, lathe, manual training school, millwright, pattern maker, ship builder, wagon maker, and for curvers, engravers, turners and all workers in wood. The only complete catalog ever issued of this line.

Number 372 BUILDERS' HARDWARE—Contractors' Edition, 198 pages of the finest hardware in the world. Shows everything necessary to equip any building. Sent free to contractors, architects or owners of proposed buildings.

Number 376 REFRIGERATORS, HOUSEHOLD—An abridged catalog which explains the reasons for the superior ice-keeping qualities of our "A" Refrigerators

Number 377 DUMB WAITERS AND HAND ELEVATORS—Giving details required to enable us to quote you intelligently. Sent free.

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ORR & LOCKETT HARDWARE CO.
Estab. 1872
CHICAGO

The World's Best Saw Bench

Heavy, finely constructed—a quality machine throughout.

Equipped with every convenience and graduation for quickly and accurately getting out work.

No time lost—no chance for mistake.

To make money—save it by installing the Crescent Double Revolving Arbor Saw bench.

Positively the only Full Universal Saw Bench built. Sent for complete catalog.

The CRESCENT MACHINE WORKS, 38-50 So. Front St., Grand Rapids, Mich.
Carpenters, builders, cabinet-makers and work-workers generally can successfully compete with the large shops by using our labor saving machinery. With any one of our machines one man will do the work of four to six men using hand tools.

They are built for hard work, accurate work and long service. Each machine is carefully tested before leaving factory. We guarantee them to give entire satisfaction, and they may be returned at our expense, if, after ten days' trial, you prefer your money back.

**Ask for Catalog "A"**

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**Seneca Falls Mfg. Co.**

218 Water Street

SENeca FALLS, N. Y., U. S. A.

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**Dorn's Revolving Mitre Box**

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

**SEND FOR BOOKLET**

**IT TELLS THE STORY**

**MANUFACTURED BY**

**Braunsdorf-Mueller Company**

1093 E. Grand Street, **ELIZABETH, N. J.**
Modern Cement Sidewalk Construction
A PRACTICAL TREATISE FOR THE WORKMAN
By
Charles Palliser
64 Pages (5½ x 7 inches)
Fully Illustrated
Handsome bound in cloth
PRICE, 50 CENTS
Sent post-paid on receipt of price.

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

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

The simplest language has been used throughout the book, all technical terms, etc., being fully explained. Contains many valuable pointers for the experienced cement-mason as well as the beginner.

INDUSTRIAL PUBLICATION CO.
16 Thomas Street
New York

GOODELL MITRE BOX
Made of STEEL - Cannot Break
First in Quality and Improvements
Automatic Stops for holding up saw. Corrugated Backs. Graduated. Gages for duplicating cuts and many other features. See for Grommet "Q."
GOODELL MFG. CO., Greenfield, Mass.

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

Millers Falls Company
28 Warren Street, NEW YORK

EVERYTHING IN PLUMBING AND STEAM GOODS
TO EVERYBODY
SAVE YOU
30 to 75%
$8.50 and up
This White Enamel Sink
Cost in one piece.
The latest idea.

$10.95 and up

$11.50
Hot Water and Low-down and Steam Boilers.

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

$7.50 and up
Artistic Lavatories Various designs.

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Laundry Tubs all styles and sizes.

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

This DUMB WAITER
complete ready to erect for - $18.50
SELF RETAINING MACHINE
HARDWOOD CAR
SECTIONAL WEIGHT
ROPE, GUIDES, HARDWARE,
knocked down and shipped with the only complete directions for erecting ever issued
SEND FOR SPECIAL PAMPHLET
R. M. Rodgers & Co.
174 Washington Av., BROOKLYN, N. Y.
The "UNIVERSAL" ADJUSTABLE HANGER can be used anywhere. It forms a perfect, practicable lock; sash cannot be opened or removed from the outside; it cannot be blown open by storms; cannot be forced open in any other way-trade demands; indestructible; will wear out a dozen screens. Ask your hardware dealer or write for free sample and catalog.

THE ADJUSTABLE HANGERS CO. 416 Marden St., Toledo, Ohio, U. S. A.

BURLINGTON Venetian and Sliding BLINDS Screens and Screen Doors

Don't Ask the Dealer for Sash Cord. Ask for "SILVER LAKE" and see that he gives it to you. It is impossible to substitute, as our name is stamped in red on the cord. Silver Lake Sash Cord is the Original Solid Braided Cotton Sash Cord and has been the standard since 1868. No other is just as good.

SILVER LAKE

THE ONLY MACHINE This machine is for stretching wire cloth on door and window frames; it does the work quickly, evenly and without waste. You would not be without it if you once used it. For prices write

H. W. SCHAFER, Mt. Pulaski, Ill.

A VALUABLE NEW BOOK JUST ISSUED SHORT CUTS IN CARPENTRY A COLLECTION OF NEW AND IMPROVED METHODS OF LAYING OUT AND ERECTING CARPENTERS' WORK By ALBERT FAIR

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

The book contains 90 large (5x7-inch) pages, illustrated by 75 engravings in the text and a large folding plate giving the names of the various parts of doors, windows, trim, etc. (This chart alone is worth the price of the book.) The practical use of geometry in laying out carpenters' work explained in a different way so the reader will know "why." How to obtain various miter cuts, both for straight and curved work. How to make a miter box. Descriptions of different kinds of moldings. Bending moldings around circles and the art of kerfing explained simply and accurately, telling why it is done and how to do it. Rake moldings and how to lay them out fully explained, and several short-cut ways of doing it. How to find the corner brackets for coves. The use of the steel square in finding various pitches, degrees, miter cuts for polygons, etc. Use of the 2-foot rule in describing various figures when no other tool is at hand. The selection and use of glue. Hints on saving time when working on hardwood. The art of blind nailing. Setting door jambs, fitting and hanging doors. Fitting windows. How to cut pockets in window frames. Remarks on framing. Short cuts in placing siding. Building a circular tower. Shingles required to cover a given roof area. Laying out octagon shingles. Quick method in finding bevel of shingles for gable. Framing a floor with short timbers. Building up a beam. Laying floors. Laying wood carpet. Constructing dished floors. The art of veneering on a small scale. Hints on inlaying. Roof framing explained on a new principle whereby you know the reason why the square is used and how to use it for different forms of roofs. How to find the sizes and cuts of braces. Bevels for hoppers. Making wheat bins. Quick method for beveling fence posts. Shaping a flag pole. Quick method of obtaining the bevel of tank staves. Making and placing well curbs, etc., etc.

PRICE ONLY 50 CENTS POSTPAID

INDUSTRIAL PUBLICATION CO., [16 Thomas St., New York
The Peerless Nail Set Holder

Don't lose your nail set
It is not wearing out the pockets of your clothes.
Not mixed up with the nails in your apron pockets.
Not in the basket or tool chest when wanted.
Not lost among the shavings.
It is always in your hand available for instant use.

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

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

THE PEERLESS SPECIALTY CO.,
77 N. Water St., ROCHESTER, N. Y.

Agents wanted.

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

MORRILL'S NO. 11 SAWSET.

'It will help you to do all three

CHAS. MORRILL
283 BROADWAY
NEW YORK

"The Nickel-plated Marsh-Ayer"

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

Circular Upon Request

H. C. MARSH COMPANY
ROCKFORD, ILLINOIS
American Carpenter and Builder

Entered as second-class matter July 1, 1903, at the postoffice at Chicago, Ill., under the Act of Congress of March 3, 1879.

Published monthly by
American Carpenter and Builder Company
185 Jackson Boulevard, Chicago.

Vol. VII May, 1909 No. 2

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

SUBSCRIPTION RATES.
One year $2.00; six months, $1.00; payable always in advance. Single Copies, 20 cents. Canadian Subscriptions, $2.50. Foreign Subscriptions, $3.00. Subscriptions may be sent by check, express or money order, or registered letter. Make all remittances payable to the American Carpenter and Builder Company. Postage stamps are not desirable, but if necessary to remit them, two-cent stamps are preferred.

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ADVERTISING RATES.
Furnished on application. The value of the AMERICAN CARPENTER AND BUILDER as an advertising medium is unquestioned. The character of the advertisements now in its columns, and the number of them, tell the whole story. Circulation considered, it is the cheapest trade journal in the United States to advertise in. Advertisements, to insure insertion in the issue of any month, should reach this office not later than the 20th of the month preceding.

THE elevator to Success is usually stuck. Try the stairs.

NO MAN ever acquired a lasting brand of popularity by knocking.

THE time to advertise is when you want more business. That's very old, but very true.

Help Stamp It Out

We want to call the attention of every reader of this magazine to what Dr. John E. White, medical director of the Woodmen Society tent-sanitarium at Colorado Springs, has to say in this number concerning the prevention, treatment and cure of tuberculosis. This is a matter of especial importance to carpenters and builders; for it touches them directly in a number of ways.

In the first place, tuberculosis, or consumption, is a disease of the masses; it levies its greatest toll on the workingmen and their families. Statistics compiled by the United States Census Bureau show that one out of every six of our people dies of tuberculosis. So self-preservation demands that every workman give the prevention and cure of this dread disease his careful study, taking it to himself as a personal matter.

In the second place, it has been conclusively proved that proper ventilation—fresh air—both in our homes and in our workshops is consumption's greatest foe. The carpenters and builders must see to it that proper arrangements are made to this end in every building they put up. Prevention is better than cure; carpenters and builders, using their influence wherever possible, can do an immeasurable amount of good in this way and so protect the whole people from the terrible ravages of this disease.

More specifically, however, Dr. White describes the benefits to be had from the now well-known "tent" treatment and cure of tuberculosis, and points out the astonishing opportunity it offers. The great fraternal organization whose tent sanitarium he describes has found that it is not only good fraternalism but also good business to cure its afflicted members. An actual saving of money has been made by fighting this disease. His suggestion that all labor organizations, fraternal societies, churches, clubs, benevolent societies, life insurance companies, municipalities, etc., should seriously take up this question deserves consideration.

With a view to making this article as practical and valuable as possible we have had prepared, and are publishing, drawings which show the construction and
arrangement of one of these sanitarium tents of the approved type. It is said that the “tent” treatment is exceedingly beneficial in any climate. Carpenters will do well to recommend it in special cases in addition to the wider organized movement. The work can be carried out following these plans or along the lines described in our January number—"A Successful Open-Air Sleeping Room." We must all work to help stamp out this terrible disease.

**For Machine Woodworkers**

AFTER a machine is bought, the price fades from memory to some extent, and nothing remains but the machine and its work. If the work is not satisfactory, no matter how much of a bargain the machine may have been considered, there is dissatisfaction as long as the machine lasts. This is one of the strongest of arguments for buying only what you are sure you need, regardless of the price, and not get a machine at the least price per pound when you start in. And, it is as well to remember that it is still an open question which is worse, to put a good man at a poor machine, or to put a poor workman at a good machine. Of course, the good man will win out in the end, no matter where he is placed; but these sort of economical experiments don’t make any money with the machine, and it is supposedly the making of money that induces the buying of a machine.

**Crisp and Sharp**

The successful business-getter
Never writes a lengthy letter,
Curbs his speech with prudent fetter,
Well boiled down!
He refrains from needless shouting,
Empty, effervescent spouting,
Senseless blowing, silly touting,
Cuts he out!
But to facts adheres he closely,
To the point, but not jocosely,
Fraught with wit, but not verbolessly,
Crisp and sharp!
Thus the sapient business-getter
Writes a strong, convincing letter,
Goes his rival many better—
And wins out!

**Whetting Your Wits**

DID it ever strike you that it is just as important to keep your wits sharp as it is to keep your tools with keen edges? Every man knows two or three old and true sayings about the importance of sharp tools, and there being no time lost in whetting. We might turn around and apply these same things equally well to the whetting of our wits. To apply them, of course, calls for a different set of appliances. It is the difficulties you meet in your business that furnish the abrasive material, and it is persistence that turns the crank and furnishes the motive power to do the grinding and whetting.

Nobody likes a quitter; yet there is a long stretch of difference between the quitter and the extreme of dogged persistence. This dogged persistence which pulls you through difficulties will not only keep your wits sharpened, but it has probably made more successes than genius alone ever made. In other words, the man who has a fair share of talents and genius can, by dogged persistence, attain prominence, and the man who has nothing but persistence is really better off than the one who has an abundance of genius and no sticking qualities.

To get started straight on this idea, take into consideration the various annoyances you have and the difficulties that obstruct your way from time to time all through the year; difficulties of every kind, including cranky people to work for, as well as the things you call “bad luck.” If you will take these things and look at them from the right angle they should add zest to life instead of bringing discouragement. There is a sort of keen pleasure in being able to finally please the crankiest man in the community whom no one else has been able to do things for satisfactorily. You have got to whet your wits and keep them in action; but the more trouble it takes, the more satisfaction there will be in the end. It is the easy road that leads to indolence, both mentally and physically. If we don’t have to overcome difficulties of one kind and another, fight against bad luck, and try to please people who don’t know what they want, there are many of us who never would amount to anything in the world.

So try getting in the habit of regarding all the difficulties that come your way as simply abrasive material with which to whet your wits and keep them sharp; apply enough dogged persistence to furnish power to pull you on over these things; and you will find in the end that there is a great deal more satisfaction in life because of these things than there would have been without them. Instead of getting discouraged and calling it bad luck every time the cranky customers come your way and everything seems to be against you, just keep at it and keep smiling. Keep taking a cheerful view of life and you will find in the end that these things are the means of assisting you on the way to greater attainment. The more difficult things you hold your edge against the better off you are, just as the harder the wood your tool holds an edge against the better the metal in the tool. And just as you do with the tool when you have some hard work to do—that is, whetting it to put a keen edge on it—get busy and whet your wits to meet and overcome difficulties. The better you are prepared in advance the less worry you will have.
Signs of Spring

Spring House Cleaning

The Gardener

Gathering May Flowers

The Real Spring Poet

May 1st with the Man who Rents and

The Man who Owns his Home
This month we are showing the four sets of house plans placed highest by the committee of judges in our recent prize competition for house and bungalow designs. After careful study and deliberation, the committee made the awards as follows:

**COMPETITION—CLASS A, HOUSES**

Third prize, $15—Ira F. McMinds, Urbana, Ill.
Fourth prize, $10—W. I. Bell, Jamaica, N. Y.

Just as with the prize-winning bungalow designs, published last month, the central idea of these house plans—and the feature of greatest weight in the judging of them—is in answer to the question, "Is it practical?" All of these designs solve the problem of the complete, compact and convenient house at moderate expense. In exterior appearance they have a distinctive character, attractive and pleasing, without being over-ornate. Complete specifications and detailed estimates of cost, in each case, showed the construction practical and the design capable of being carried out at the figures stated. It is a matter of regret to us that limitations of space have prevented our giving everything connected with each of these prize-winning designs—details, specifications, bill of material, itemized estimate. Sufficient material has been selected from the exhibit of each design, however, to properly show what it is; also different features have been emphasized in each.

**First Prize—House to Cost $2,800**

*Designed by A. G. Donaldson, Flint, Mich.*

A BRIEF specification of this house, arranged alphabetically, is as follows: Basement is to be divided by rough partitions of 2-inch boards on 2 by 4 inch studs and sills; rough doors.

Exterior: rough cast dark gray below belt course; grout wall rough finish to sill. Stained shingles, extra Star A Star in quality, above belt course, weathered gray finish. Roof green. Wood trim, belt course,
window and door frame. Porch finish outside ivory white, barge board and show rafters.

Interior; oak finish and floor in hall, living-room and dining-room, also stair. Hall rack built in. Floors combination fixtures. Piped for fuel gas in kitchen. Plumbing; white enamel bathroom fixture, all vented. Laundry tubs, kitchen sink white enamel or cast iron. Coil in furnace connected tank in basement.

natural finish in living-room and hall, flemish green.
Dining-room silver gray. Kitchen natural finish, yellow pine, maple floor. Rear hall same as kitchen.

Interior finish upstairs; white enamel paint, yellow pine floors. Walls finished tinted above picture mold.

Cartridge paper and burlap finish below.
Hardware dull throughout. Glass American plate.
Heating, hot-air furnace.
Lighting; combination gas and electric, dull brass.

---

**Estimate of Cost**

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excavation</td>
<td>$52.50</td>
</tr>
<tr>
<td>Foundation (and wall above grade)</td>
<td>235.52</td>
</tr>
<tr>
<td>Masonry (chimney and footing)</td>
<td>58.00</td>
</tr>
<tr>
<td>Carpentry (material)</td>
<td>940.00</td>
</tr>
<tr>
<td>Carpentry work</td>
<td>678.20</td>
</tr>
<tr>
<td>Plumbing (including bath fixtures, hot-water tank and coil, eaves trough, drain)</td>
<td>203.24</td>
</tr>
<tr>
<td>Plastering (lathing included)</td>
<td>224.00</td>
</tr>
</tbody>
</table>
Painting (including stain for shingles) .......................... 92.80
Furnace ................................................................. 175.00
Wiring ................................................................. 24.00
Gas piping .............................................................. 18.00
Decorating (tinting) ................................................ 46.64
Fixtures ................................................................. 41.00

Total ................................................................. $2,795.72

Labor costs used for these figures are as follows:
Carpenters 25 to 30 cents per hour.
Masons 40 to 60 cents per hour.
Painters 25 to 35 cents per hour.
Excavation 25 cents per cubic yard.
Decorators 30 to 40 cents per hour.
These figures include contractor's profit and there is
still a remainder of about two hundred dollars for the
incidental costs that are always to be counted on. Figures
are based on local costs with a considerable allowance,
as local costs seem to be quite a bit less than those of
neighboring places.
The estimator is certain that the house could be built
and well finished for the above cost (ready for occu-
pancy).

Second Prize—House to Cost $2,700

Designed by H. A. Creager, Grand Rapids, Mich.

The cellar of this house is to extend under the
whole house and contains furnace-room, fuel-
room and fruit cellar. Concrete foundations are
to be made of 1 part Portland cement, 2/3 parts sand
and 5 parts gravel. Two courses of paving brick are
to be laid at grade line. Exterior of building is to be
covered with expanded metal lath and plastered with
Portland cement and lime mortar in rough sand finish.
Framing timber and sheathing is to be of hemlock;
shingles red cedar; exterior finish and window frames
of cypress. The kinds of lumber used in interior fin-
ish are indicated on the floor plans. The dining-room
is to be provided with a neat molded plate shelf 4½
inches wide. The kitchen dresser is to be provided
with flour bin, drawers and cupboards. The mantel
is to be built as shown on plans and detail.
The exterior finish of first story is to be painted
two coats of lead and oil; color ivory white. All wood-
work above second story is to be stained dark brown.
The interior finish of the entire house, except
kitchen, is to be stained, shellaced and waxed; this in-
cludes the floors. The kitchen finish is to be filled
with pine wood filler, shellaced and varnished.
Exposed plumbing is to be installed with suitable
fixtures as called for on plans. A boiler is to be placed
in cellar and connected with coil in furnace with hot
and cold water to each fixture. The house is to be
piped for gas but no fixtures to be installed.
A suitable furnace is to be installed, capable of
warming the house to 70 degrees in any temperature.
Hardware trimmings to cost $45.00.
Estimate of Cost

Excavating ............................................. $ 37.00
Concrete work (cement and gravel $100, labor $75) ........ 175.00
Interior plastering (lime, sand, lath, etc., $73, labor $94) .. $ 167.00
Exterior plastering (cement, sand and lath $140, labor $52) .. 192.00
Carpenter work (rough lumber, shingles, flooring, etc., $494, labor $210) ...... 704.00
Millwork (doors, mantel and trim $500, labor $200) .......... 700.00
Painting (lead, oil, stain, etc., $60, labor $50) ........... 110.00
Plumbing (materials $190, labor $90) ........... 280.00
Furnace ..................................................... 115.00
Hardware .................................................. 95.00
Glass ......................................................... 40.00
Tinning ....................................................... 40.00
Porch and cellar floor (cement and sand $30, labor $22) .. 52.00

Total cost of house . $2,685.00

The above prices are based on the following schedule of labor prices per hour: Carpenters, 35c; brick masons, 50c; plumbers, 40c; laborers, 20c; plasterers, 50c; painters, 40c; concrete workers, 30c.
Third Prize—House to Cost $2,900

Designed by Ira F. McMinds, Urbana, Ill.

ExcaVating for this house is to be made 4½ feet deep. The dirt is to be retained on the lot, and after masonry is completed and mortar has set, the dirt is to be graded around to the wall. The wall shall be made of concrete up to the grade line, and brick from grade line to top of wall.

Chimney.—Make where shown on plans an 8 by 16 inch flue of good flue brick. Same is to be lined with good earthen flue lining. Top to be a cement cap and projecting brick courses as shown in elevation. Provide same with clean-out hole in basement with cast iron door, and a large flue thimble to connect furnace pipe into.

Concrete Work.—The whole of the cellar floor shall be laid with a 3-inch concrete floor and also in grade entrance way. Concrete steps to front and back porch as shown.

Carpenter Specifications.—The whole of the timber used in and throughout the building is to be the best of its respective kind, free from large or loose knots, shake, sap or other imperfections impairing its durability or strength. All sills to be made of what is termed “box sill,” using a 2 by 8 inch wall plate and 2 by 10 inch on edge, set flush with face of wall plate. All frame lumber must be of good yellow pine. Sizes are to be: First and second floor joist, 2 by 10 inch; attic floor joist, 2 by 6 inch; studding and rafters, 2 by 4 inch; sheathing for roof work, 1 ½ by 4 inch; storm sheathing, 1 by 8 inch. All joist and studding shall be spaced 16 inches on centers. Rafters shall be spaced 20 inches on centers. All joist, studs, rafters and sills shall be well fitted and spiked in place with No. 16 common nails.

Double studs shall be placed around all window and door openings. All doors and windows 4 feet wide and over shall be trussed over with 2 by 4 inch studs, triangular shape. All partitions parred with joist, same shall be doubled.

All first and second floor joist having spans over 7 feet shall have one row of cross bridging cut to fit, made of 1 by 4 inch strips nailed at each end with two 8-penny nails, and all spans over 14 feet shall have two rows of bridging. All joist must be brought to line at place of nailing of bridging.

Cover the entire first floor with No. 2 6-inch D. P. M., laid at an angle of 45 degrees with joist, and joints must be made on joists and nailed at each bearing with two 8-penny nails after floor has been driven tight together. The attic floor shall be laid with joist, nailed at each bearing with two 8-penny nails, joints being made on joist only.

The entire outside wall surface is to be covered with No. 2 8-inch decking boards, laid at an angle of 45 degrees with the studs and making a brace for each corner, making a joint up the center of each span, nailed with three 8-pound nails at each bearing and drawn tight together at all joinings.

Cover the entire roof surface with 1 by 4 inch strips laid with 3-inch cracks. All joinings must be made on rafters and nailed with two 8-penny nails. Cover with best red rosin-sized paper before laying shingles. Same to have at least 3-inch lap. Then cover the main roof with best 5 to 2-inch red cedar shingles laid 5 inches to the weather, nailed with two 3-penny galvanized nails to each and every shingle.

The main cornice shall run around the entire house and shall project 24 inches from main wall to outer edge of facia; the gable cornice is to be same width as main cornice; the cornice across at base of gables to be shingled and the gable cornice set on, gables to be sided and shingled as shown on elevations.

Interior Finish.—Front room and dining-room to be finished in red oak, also stairway to first landing. Finish in the front and dining-room to be molded cap and round edge side casings with base blocks at doors, base to have mold at top, and shoe at floor base will be of three members 9½ inches high. There is to be a beam...
ceiling in sitting and dining room. Oak floor in sitting and dining room made of 3/4 by 1\(\frac{1}{2}\) inch matched flooring well nailed and polished to a smooth surface. Inch bevel plate glass door 3 feet by 7 feet 6 inches, 1\(\frac{3}{4}\) inches thick, glass size 26 by 48 inch and one panel below glass. Back porch and grade entrance doors to be made of good solid stock white pine, 1\(\frac{3}{4}\) inches thick, and have one light 26 by 36 inch D. S. glass. All other doors throughout to be 5 cross-panel doors 1\(\frac{3}{4}\) inches thick. All doors shall be No. 1 white pine unless otherwise specified. All doors and windows must be placed where marked on plans.

Bathroom.—The bathroom shall have three large drawers where marked on plans, 7 inches deep, and as long as will go in the space. The wall shall be plastered with Keens cement 4 feet 6 inches high from the floor and a molded strip put over the joining of the cement plaster and other white mortar, the rock wall plaster making the first coat for all.

Painting.—All woodwork shall be kept primed as fast as put in place. Window and door frames must be primed before set in place, also corner and outside base boards must be primed before siding is put on. After all work is up and prime coat has been on
at least seven days, the second coat may be applied. This coat must stand ten days before last coat is applied. All outside paint must be good white lead and linseed oil paint well brushed out on the surface when applied.

All shingles shall be stained with a dark green creosote stain by dipping the shingles in the stain to a depth of 13 inches from the butt of the shingle and allowed to dry before applying to roof and wall surface.

All inside work except oak floors to have one coat liquid filler and two coats interior varnish. The filler coat must be well sanded after it has dried for two days. Then apply the first coat of varnish. The first coat of varnish must be thoroughly dried before the last coat is applied to insure a good gloss finish.

The floors, where of oak, to have one coat of filler and two coats of floor wax applied with a cloth and polished with a heavy polished brush, giving time between coats so that the first coat is hard before the second one is applied.

**Inside Hardware.**—All 13/4-inch doors are to have three 4 by 4 old copper finish butts; all 13/4-inch doors to have two 3½ by 3½ inch old copper finish butts; all attic and cellar windows and doors to be hung with good japanned steel butts, 2 by 2 for window sash and 3½ by 3½ for doors.

All windows double hung to have old copper sash locks and lifts, also of pressed steel. All door locks to be metal knobs and long escutcheons making both knob and key plate, all to have brass striking bolts and key bolts, all to be old copper finish, except front door lock, which is to be a good front door lock with night lock attachment, also of old copper finish. All cupboard and wardrobe hooks to be made of copper.

**Tin Work.**—All gutters where marked on plans to be of galvanized iron. All coping and hip shingles to be of good galvanized iron, also ball ornaments as shown on elevations. All valleys to be of tin 14 inches wide, painted on both sides before laid in place. All flashing tin to be of same quality, front porch roof to be laid with same grade tin and painted on the under side, before laid, also cover roof with felt paper before laying.

**Electric Wiring.**—Wire the house for electric lighting, putting drops where marked on plans “E. L.” Put two 3-wire switches to operate the center light in living-room and hall light upstairs. Put a switch at front door to turn on porch light, also living-room light on beams; also a switch to operate lights attached to ceiling beam crossings, both in living-room and dining-room, both to be on separate switches; a switch in dining-room to operate main light. All other lights to turn on at light only; all switches to be flush switches in steel boxes. All wiring to be in accord with underwriters’ specifications.

**Plumbing.**—The plumbing is to be according to layout furnished by architect. Soft water is to be provided at the sink in kitchen. There is to be a force pump to take water from cistern and force same to a supply tank in the attic; then the soft water is to be carried to bath tub, lavatory in bathroom, and also sink in kitchen. The soft water is to be attached to range boiler in basement, and hot water carried to both tub and lavatory in bathroom and to sink in kitchen.

City water is to be brought from street and run to sink in kitchen, and to toilet and washstand in bathroom; a faucet in the basement and a sill cock with hose attachment to be located to suit owner.

The sewer is to be brought from street main to within 4 feet of the foundation wall and then connected to the drain with 4-inch cast iron soil pipe and same run to toilet in bathroom. This pipe is to extend through the roof for vent stack. The cellar drain is to connect to main sewer tile. Same to have bell trap in concrete floor and a large S trap before reaching sewer tile. The main sewer is also to have a house trap just inside basement wall. All fixtures are to be vented and same carried to main vent stack, which will connect above closet in bathroom to main soil pipe.

There shall be a 5-foot bath tub C. I. porcelain lined, 2½-inch roll rim; lavatory 24 by 18 inch, 15-inch high back, oval bowl, 5-inch curtain cast in one piece and porcelain lined. Toilet to be a low-down tank, siphon washdown stool. All of the above to have nickedel trimmings; and S trap to lavatory, and a drum trap to bath tub. Sink in kitchen to be 18 by 30 inch, 15-inch high back. Back may be separate, but a drain board must be provided for at end of sink, all to be porcelain lined, cast iron. Use an S trap to sink. All faucets at sinks and lavatories to be self-closing patterns and nickel finished.

**Estimate of Cost**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>165 yards excavating at 20c</td>
<td>$33.00</td>
</tr>
<tr>
<td>225 lineal feet concrete footing, 6 by 15 inches</td>
<td>$17.00</td>
</tr>
<tr>
<td>987 square feet concrete wall</td>
<td>$30.00</td>
</tr>
<tr>
<td>Brick work</td>
<td>$90.20</td>
</tr>
<tr>
<td>690 square feet basement floor</td>
<td>$37.75</td>
</tr>
<tr>
<td>Front porch floor, caps and steps</td>
<td>$32.35</td>
</tr>
<tr>
<td>Total for excavating and concrete, cementing and masonry</td>
<td>$349.30</td>
</tr>
<tr>
<td>Tin work</td>
<td>$64.39</td>
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<tr>
<td>Rough hardware</td>
<td>$25.05</td>
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<tr>
<td>Shelf hardware</td>
<td>$26.84</td>
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<tr>
<td>Total for hardware</td>
<td>$51.89</td>
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<tr>
<td>Lumber bill</td>
<td>$359.44</td>
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<tr>
<td>Millwork</td>
<td>$359.01</td>
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<tr>
<td>Carpenter work, 982 hours at 40c</td>
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<tr>
<td>Plastering, 720 yards at 30c</td>
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<tr>
<td>Plumbing</td>
<td>$250.00</td>
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<tr>
<td>Electric work, wiring for lighting</td>
<td>$35.00</td>
</tr>
<tr>
<td>Painting, 50½ yards at 27c</td>
<td>$135.35</td>
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<tr>
<td>Heating, hot-air furnace</td>
<td>$225.00</td>
</tr>
<tr>
<td>Incidental, 5 per cent</td>
<td>$123.84</td>
</tr>
<tr>
<td>Total</td>
<td>$2,807.62</td>
</tr>
</tbody>
</table>
Fourth Prize—House to Cost $3,000
Designed by W. I. Bell, Jamaica, N. Y.

A brief specification for this design includes the following: Foundation walls and porch piers, up to level of first beams, are to be local stone 18 inches thick, laid up in Portland cement mortar. Cellar floor to be 2-inch Portland cement.

Chimney to be brick lined with 1-inch fire clay tile.

Framing timber is to be all spruce, as follows: Girders, 8 by 12 inch; sills, 4 by 6 inch; 1st and 2nd floor beams, 2 by 10 inch; studs and second floor ceiling beams, 2 by 4 inch; hips and ridge, 2 by 10 inch; rafters, 2 by 6 inch; sheathing, 7/8 by 6 or 8 inch tongued and grooved spruce; siding, from water-table to belt course, 6-inch beveled siding; shingles, from belt to roof, cypress shingles; floors, 7/8 by 3 1/2 inch tongued and grooved N. C. pine; exterior trim, all cypress (as detailed); interior trim, all cypress (as detailed); dining-room mantel, to be Colonial brick.

Plastering to be good grade hard wall plaster.

House to be heated with hot-air furnace having separate pipe to each room.

Plumbing.—Bathroom to have basin, closet and bath. Kitchen to have sink, two-compartment stone tubs and small range. All fixtures to be porcelain enamel.

Boiler to be 35-gallon galvanized iron. Water system throughout to be of 3/4-inch galvanized iron pipe.
Gas Fitting.—House to be piped with ½-inch pipe with outlet for each room and cellar.

Metal Work.—All roof shingles to be metal of standard approved make. Gutters to be galvanized iron troughs with adjustable hangers. Leaders to be 3-inch corrugated galvanized iron.

--- Side Elevation ---

All exterior woodwork (except wood shingles and soffits of roof) to have three coats of paint. Wood shingles to be stained. Soffits of roof to be varnished with two coats of spar varnish. Metal shingle roofs to have two coats of paint of dark tile color.

**Estimate of Cost**

<table>
<thead>
<tr>
<th>Work</th>
<th>Labor Material Both</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excavation</td>
<td></td>
</tr>
<tr>
<td>150 cu. yds. at 30c</td>
<td>$ 45.00</td>
</tr>
<tr>
<td>Footings</td>
<td></td>
</tr>
<tr>
<td>(Concrete) 10 cu. yds.</td>
<td></td>
</tr>
<tr>
<td>Proportion 1:2:4.</td>
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</tr>
<tr>
<td>Bbls. cement in 1 cu. yd., 1½, $3.00</td>
<td></td>
</tr>
<tr>
<td>Bbls. sand, 3</td>
<td>75</td>
</tr>
<tr>
<td>Bbls. gravel, 6</td>
<td>2.00</td>
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<tr>
<td>Cost of 1 cu. yd. $5.75</td>
<td>$ 57.50</td>
</tr>
<tr>
<td>Labor, at $1.08 per cu. yd. $ 10.80</td>
<td>68.30</td>
</tr>
<tr>
<td>Stonework—37 perch.</td>
<td></td>
</tr>
<tr>
<td>1 perch stone</td>
<td>$1.25</td>
</tr>
<tr>
<td>½ bbl. cement, at 1.00</td>
<td></td>
</tr>
<tr>
<td>1/6 load sand, at $1.75</td>
<td>29</td>
</tr>
<tr>
<td>Material cost 1 perch. $2.54</td>
<td>93.98</td>
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<tr>
<td>1/3 day, mason</td>
<td>$1.83</td>
</tr>
<tr>
<td>¼ day laborer, at $2.00</td>
<td>0.50</td>
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<tr>
<td>Labor cost of 1 perch. $2.33</td>
<td>86.21</td>
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<tr>
<td>Bluestone—</td>
<td></td>
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<tr>
<td>5 window sills 4 feet by 4 by 10 in., at 60c per ft. $12.00</td>
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</tr>
<tr>
<td>1 window sill, 2 ft.  by 4 by 10 in., at 60c per ft. 1.20</td>
<td></td>
</tr>
<tr>
<td>Chimney—</td>
<td></td>
</tr>
<tr>
<td>4,000 brick.</td>
<td></td>
</tr>
<tr>
<td>Cost of 1 labor per M $9.00</td>
<td>36.00</td>
</tr>
<tr>
<td>60 ft. 8 by 12 in.</td>
<td></td>
</tr>
<tr>
<td>flue lining at 22c</td>
<td>2.00</td>
</tr>
<tr>
<td>Chimney cap</td>
<td>1.00</td>
</tr>
<tr>
<td>Colonial brick mantel</td>
<td></td>
</tr>
<tr>
<td>9.00</td>
<td>20.00</td>
</tr>
<tr>
<td>Cellar Floor—</td>
<td></td>
</tr>
<tr>
<td>(Portland). 56 sq. yds., at 60c 11.20</td>
<td>22.40</td>
</tr>
<tr>
<td>Girder Columns—</td>
<td></td>
</tr>
<tr>
<td>4 3-in. concrete filled pipe columns 3.00</td>
<td>6.40</td>
</tr>
<tr>
<td>Labor setting, at 10c a ft. 2.20</td>
<td>15.40</td>
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<tr>
<td>Chimney—</td>
<td></td>
</tr>
<tr>
<td>4,000 brick.</td>
<td></td>
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<tr>
<td>Cost of 1 labor per M $9.00</td>
<td>36.00</td>
</tr>
<tr>
<td>60 ft. 8 by 12 in.</td>
<td></td>
</tr>
<tr>
<td>flue lining at 22c</td>
<td>2.00</td>
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<td>9.00</td>
<td>20.00</td>
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<td></td>
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<td></td>
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<td>6.40</td>
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<tr>
<td>Labor setting, at 10c a ft. 2.20</td>
<td>15.40</td>
</tr>
<tr>
<td>Sheet Metal—</td>
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</tr>
<tr>
<td>105 ft. 3-in. leader  at 15c $15.75</td>
<td>5.00</td>
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<tr>
<td>5 elbows, at 30c 1.50</td>
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<tr>
<td>50 conductor fasteners 1.00</td>
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<tr>
<td>136 ft. galvanized</td>
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<tr>
<td>iron gutter 24.00</td>
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<tr>
<td>75 shanks and troughs 4.00</td>
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</tr>
<tr>
<td>Nails 1.75</td>
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</tr>
<tr>
<td>Flashing</td>
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</tr>
<tr>
<td>5.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Metal shingles, 12 sq. at $5.00 $50.00</td>
<td>5.00</td>
</tr>
<tr>
<td>130 ft. hip and ridge roll, at 7c 9.10</td>
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</tr>
<tr>
<td>Lathing and Plastering</td>
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<tr>
<td>586 sq. yds., at 40c 147.00</td>
<td>88.00</td>
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<tr>
<td>Heating—</td>
<td></td>
</tr>
<tr>
<td>Steel furnace</td>
<td>$50.00</td>
</tr>
<tr>
<td>Piping, cold-air box</td>
<td>184.05</td>
</tr>
<tr>
<td>Heating—</td>
<td></td>
</tr>
<tr>
<td>Steel furnace</td>
<td>$50.00</td>
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<tr>
<td>Piping, cold-air box</td>
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<tr>
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<td>$50.00</td>
</tr>
<tr>
<td>Piping, cold-air box</td>
<td>184.05</td>
</tr>
</tbody>
</table>
Plumbing and Gas Fitting—
Gas fixtures .......... $25.66
1 2-section stone tub. 25.00
1 range with 24-gal.
boiler ................ 60.00
1 18 by 24 inch por-
celain enamel sink
with drain board .... 27.00
1 porcelain enamel
basin .................. 20.00
1 porcelain enamel
siphonic closet ..... 23.00
1 4-ft. 6-in. porcelain
enamel bath tub ... 30.00
Pipes and fittings... 40.00

$250.66

Labor Material Both
Labor .................. 125.00
375.66

Floors—Cost of a square of
flooring—Joists 2 by 10 in.,
16 in. o. c. equals 127 bd.
ft., at $30............. $ 375
Labor, per sq. 100 ft. 1.50
Nails .................. .10
Bridging ............... .50
Flooring, 100 ft. N.
C. pine at $50........ 5.00
Waste, 1/3 of stock.. 1.67
Labor .................. 1.50
Nails, 5 lb., at 4c... 1.20

Total, per sq........ $14.22
Total squares first and sec-
ond floor, 10 sq., at $14.22. 30.00 112.20 142.20
Porch floor, 11/2 sq......... 4.50 16.83 21.33

Carpenter Work—
34 ft. girder, 8 by 10 in.,
114 bd. ft.; 113 ft. sill, 4 by
6 in., 226 bd. ft.; 113 ft.
plate, 4 by 4 in., 151 bd. ft.;
8 posts, 4 by 6 in., 22 ft.,
352 bd. ft. Total, 843 bd. ft.
843 bd. ft., at $30 per M... 24.50

Labor, at $12 per M........ 10.20

Sidewalls—
18 sq., at $9.55........ 54.00 117.90 171.90
Siding and Paper—
9 sq., at $7.22........ 20.00 45.00 65.00
Shingles and Paper—
8 sq., at $6.50........ 17.60 34.40 52.00
Inside Studding ........ 16.00 20.00 36.00

34.70

Millwork—6 Cellar Windows 3.00 17.10 20.10
Windows—First and second floors. Window frame.$1.20  
Sashes .............. 1.75  
Weight .............. .38  
Sash cord ........... .20  
Sash fast. ........... .25  
Inside casing ....... .70  
Stop beads .......... .28  
Labor, 8 hrs., 434c. 3.50  
Cost window in place.$8.26  
22 windows, at $8.26...... 104.72  

Porch stairs ................ 5.00  
Porch columns, 4 at $8..... 8.00  
Porch pilasters, 2 at $6..... 4.00  
Porch balustrade .......... 3.50  
Porch ceiling ............ 8.00  
Porch cornice, 39 ft. at 75c.. 8.00  
Main roof cornice ......... 23.00  
Belt course, 85 ft. at 15c..... 5.00  
Water table, 85 ft. at 15c.... 5.00  
Lattice, 42 sq. ft., at 15c..... 3.30  
Corner boards .......... 5.80  

Doors—Cost per door.  
Door, 2 ft. 6 in. by 6 ft. 8 in. by 1½ in., price..$2.40  
Frame ................ 1.00  
Casings .............. 1.33  
Threshold ........... .15  
Nails ................. .05  
Hardware ............ 1.25  
Labor, 8 hrs., at 434c. 3.50  

Cost of door in place.$9.08  
15 doors, at $9.08...... 145.20  
Front Door—  
Cellar stairs ........... 4.00  
Main stairs .......... 15.00  

China closet ................ 10.00  
Picture mold, 225 ft. at 5c... 3.00  
Base, 300 ft. at 10c...... 15.00  
Painting .............. 160.00  

Summary                  $ 45.00
Excavation               433.41
Masonry                 1,406.03
Carpentry and hardware  184.00
Sheet metal work .......... 235.00
Plastering .............. 375.66
Plumbing and gas fitting 120.00
Heating, hot-air .......... 200.00

Total cost .............. $3,000.00
The Tent Cure for Tuberculosis

What One Organization Is Doing for Its Stricken Members—What Other Organizations Should Do—Cheaper to Cure Patients Than to Let Them Die

By John E. White, M. D.

The fight against consumption, tuberculosis, the white plague, or whatever name you may choose to call it—it is equally destructive and horrible by any name—has always been considered well-nigh hopeless and any money spent in that direction has been charged to pure benevolence—in which the giving is its own reward. It now appears, however, that, with our modern knowledge and methods, what was formerly judged just good fraternalism now proves to be good business.

Tuberculosis can be cured. Moreover, the cure is economical—actually cheaper than to let the patient die.

About two years ago the Modern Woodmen of America conceived the idea of building an up-to-date tent sanatorium, with the thought that money could be saved by preventing deaths from tuberculosis. Investigation of their records developed the fact that during the last eighteen years they have paid 5,280 death claims on account of this disease. This society has, in other words, paid out over $10,000,000 to tuberculosis. The disease has constituted 14.1 per cent of all their deaths. In the way of explanation it should be stated that these figures are very low as compared with other societies. The general statistics of the United States Census Bureau states that over 16 per cent or one-sixth of our people in the United States die of tuberculosis.

These figures of the Modern Woodmen of America attracted the attention of the executive council of that order and they decided to build a sanatorium at Colorado Springs. The subject was fully discussed and finally the council was authorized to take from the general per capita fund ten cents per member per year to build and maintain this sanatorium. Something like $80,000 had already been voluntarily contributed. With these funds a tract of 1,380 acres was procured about nine miles from Colorado Springs, Col. The first colony was ready for the reception of patients January 1, 1909, and was equipped to care for 60.

A very good idea of the lay-out and the construction of this camp may be gained from the photographs and plans. The tents are octagonal structures, 12 feet wide and 6 feet to the eaves, with shingle roofs, canvas sides, hardwood floors on solid cement foundations. They are equipped with all modern and sanitary conveniences, and each tent will accommodate one patient. Each tent, completely equipped, represents an expense of $250. An administration building...
for physicians, nurses, dining-hall, baths of all kinds, etc., stands in the center of the colony. During the past eight months a great deal of work has been accomplished. Water works have been constructed, roads built, and much general work done. On January 1st the first colony of 60 tents was opened and rapidly filled. Other colonies will soon be constructed, as it is the hope to carry the building up to a capacity of 500 beds.

In the last few years humanity has become better acquainted with tuberculosis in its various phases, its almost universal prevalence and its fearful death loss. We have come to realize that it is the disease of the masses. It is especially the poor man’s most frequent and most fatal disease. Individually the poor man has but small chances of curing it for it takes money to get well of tuberculosis. Someone has said that there is but one cure for consumption and that is gold. By this is meant that when one has the disease he must stop work (which usually means the income stops) and devote all his time to the treatment of his disease. He must have the best of food; in fact, he must be put on Easy street and make a fight for his life. How many wage earners can meet these requirements in establishing a cure?

In order to contract tuberculosis two factors are necessary, the seed and the soil. The seed is the germ called the tubercle bacillus. It is a very small microscopic parasite. Ten thousand placed end to end measure approximately one inch. This parasite is man’s greatest destroyer, killing in the United States one person every minute and 38 seconds, or 200,000 each year. Tuberculosis is nothing more nor less than an implantation of this vegetable parasite within some part of the body. Any part of the body may become infected. The parasite may lodge in the skin, bone, liver, lung, kidney or, in fact, in any part of the body with the exception of the hair. We then speak of the disease as tuberculosis of that part.

In order to have the germs produce the disease in one it is necessary for him to have the right soil conditions. If he be in perfect health the seed falls upon rock soil and the disease is not produced. No doubt, we all inhale the tubercle bacilli, but many of us throw it off and it does not implant itself. But suppose the soil conditions are favorable, what do we find? In the wage earner we find him very often overworked, poorly nourished and with the home lacking in fresh air and sunlight. Anything, in fact, that tends to reduce the vitality of the individual invites the implantation of the germs of consumption.

It has been known for several years that tuberculosis was preventable; preventable by education as to how the disease is spread from one to another; how it is avoided by making the consumptive in the home careful of what he raises or spits out, and destroying it by fire and not letting it dry; for then it can be blown about more easily. It is still further preventable by teaching the great value of fresh air, first, last and all the time, especially in the workshop or factory and in the bedroom where he sleeps. The windows should be wide open in the sleeping-room, not just a few inches top and bottom, but wide open summer and winter.

We are told that tuberculosis is decreasing, that it has decreased something like 15 per cent in the last 15 years. New York City reports that the disease has been reduced 40 per cent; Boston reports a reduction...
of 45 per cent in 15 years. Much of this can be credited to the improved living conditions of workingmen, both at work and in their homes. Shorter working hours, better pay, better food and more intelligent living have had their beneficial effects.

Carpenters, builders and other progressive workmen of this country stand today in a position to do much good in the crusade against the “Great White Plague.” They must be more fully informed how to prevent this disease. Every man should become personally interested in the crusade. He must see to it that he has more fresh air. Air costs nothing. He must have more nourishing food. In order to have workmen understand these plain facts they must be told, they must be educated upon this tuberculosis problem.

It is a live question. Prevention is of far more importance than cure, but since we have so many among us that have already contracted the disease and want to get well we must take that side of the question.

Consumption is curable in the earlier stages. This fact cannot be denied. Every sanatorium in the country will testify to this fact. Sanatorium care is rather expensive, but such institutions are practically the only place where a goodly percentage of cures can be made. It is very difficult to cure a patient in the home, and for this reason sanatoria have become a necessity. We have already stated that the average wage earner cannot successfully combat this disease because he has not the means. Our only hope for these unfortunates is in giving them organized help. The burden upon any one individual in thus helping his fellowman will be very light, while an immense amount of good will be done toward the complete stamping out of this scourge.

Which prompts this question: If the Woodmen society finds it to be “good business,” as well as good fraternalism, to fight consumption in this way, why should not other fraternal societies, life insurance companies, labor organizations, the national and international church bodies, etc., find it profitable, from the viewpoint of business or benevolence, or both, to take such action?

Each life saved to the Woodmen society, by means of this sanatorium, will, it is stated, represent a saving of $1,700—the average amount of the Woodmen policies in force—at an expense for treatment of approximately one-twentieth of that sum. In the broader sense, each life saved means the preservation to the family of its head and bread-winner, and to the state of a useful, self-sustaining citizen.
An Artistic Bungalow for $2,900
FINE EXAMPLE OF WHAT SKILLFUL DESIGNING, GOOD TASTE, AND A SMALL AMOUNT OF MONEY CAN DO IN PRODUCING A MODERN COTTAGE

This exceedingly attractive bungalow was designed by Charles P. Rawson, architect, for his own use and was erected under his personal supervision at Fort Worth, Texas. The exterior of the house up to the window sills and above the windows is covered with rough boards laid 10 inches to the weather and stained a rich brown, the space between the windows being filled with narrow siding, painted white. All chimneys are finished in cream-colored plaster. The pergola at the side has a floor of red brick.

The interior of the house is unusually attractive. The living-room is of ample size and is finished in yellow pine stained green; it has a beamed ceiling and a brick mantel; and an imported, hand-colored, landscape frieze running around the entire room. The walls below this frieze are of plain rich blue, and the panels of the ceiling cream or light yellow. The dining-room has a high wainscot capped with plate rail and is finished throughout in browns and yellows, and has a built-in china closet with leaded glass doors. The bedrooms are in white enamel, with the walls hung with rich flowered paper.

Two bedrooms are provided, each with a good-sized clothes closet. There is also a closet for table linen, extra bedding, etc., off the back hall. So the charge that is sometimes brought against the bungalow—that it gives no chance to lay anything away—does not hold good in this case.

The arrangement of the rear portion of the house is unusually convenient, and the large attic gives plenty of space for storage. This house is an unusually good example of what can be done in an artistic way without excessive expense, as the total cost of the house and decorations did not exceed $2,900. Just to show that to build such a bungalow as this is not a bad investment it might be stated that it was sold recently for $4,000. Thus special thought and care in the planning of a residence pay for themselves.
The Living-room — Looking Toward the Right

Very Artistic and Homelike Five-room Bungalow
The Living-room — Looking Toward the Left

A View of the Dining-room
Possibilities of the Steel Square

Useful Things to Know—How to Reckon the Contents of Boards—How to Draw Circles, Ovals, etc. All by Means of the Steel Square

Most all of the steel squares manufactured nowadays contain a board measure stamped on the blade; but very few carpenters ever think of referring to it, and a larger portion do not even know how to use it. Be that as it may, here is a board measure based on the square that is not generally known, and is more complete than any stamped on the blade. It is as follows:

Draw a line, A-B, as shown in Fig. 243. On this line place the square as shown. Now suppose the board we wish to measure is 17 feet 9 inches long. Draw a line from 12 on the tongue, passing at 17 9/12 inches on the blade, continuing same indefinitely. This line we will call C D, C being at the point of intersection of A B. Now, if the plank be 7 1/2 inches wide, slide the square along the line A B, letting 7 1/2 on the tongue rest at C, and we find that C D passes at 11 2/12 inches on the blade, representing 11 2/12 feet. If the board be 14 inches wide, let 14 on tongue rest at C, and we find the line passes at 20 and eight and one-half twelfths inches, which represents a little over 20 2/3 feet of lumber in the board, which is reckoned to be 1 inch thick. This method solves fractional lengths and widths as readily as in even inches and feet.

Here is another problem that can be readily solved with the steel square. It often happens that a compass is not at hand when a true circle is required for some special piece of work. Suppose a circle with a 15-inch diameter is wanted—it may be found as follows:

Drive two small brads 15 inches apart, as shown in Fig. 244. Place the inside edges of the square against the brads and with pencil point in the angle, slide the square around, always keeping the edges against the brads and the pencil will describe a true half circle. Reverse the square to the other side and repeat the operation and the desired circle will be formed.

A circle may be formed by using all straight lines,
as shown in Fig. 245. The lines are run to the inch divisions on the square, but they could be just as well run to the half or quarter divisions. In fact, the more lines used, the more true the circle will be formed, as will plainly be seen by referring to the illustration.

The oval may also be laid off, as shown in Fig. 246. A B represents one-half of the short diameter, and A C the same for the long diameter. Take a straight-edge and on it lay off these measurements, as a-b and a-c. Drive brads at a and b and make a hole at c large enough to insert a pencil point. Now, by moving the straight-edge so that the brads will slide along the outer edges of the square, the point at c will describe one-fourth part of the oval. By turning the square over, letting the blade rest along the line A C as before and repeating the operation, one-half of the oval will be outlined. Proceed in like manner for the other half.

Oval-shaped arches are quite commonly used in building construction and interior decoration; but the workmen often lose in architectural effect by trying to form them with parts of true circles. While such arches may be more easily arrived at, they are a failure from an architectural point of view.

In Fig. 247 and 248 are shown how such arches may be formed. In the former, the oval is formed by four full quarter circles of two sizes. The centers being at a a a a and the intersections at the dotted lines. The parts are quadrants of 90 degrees, and so placed as to make the least perceptible irregularity in the curve. In the latter, the oval is formed by two large quadrants of 60 degrees, and two of 20 degrees; but as we said before, ovals formed in this way are lacking in that graceful ever-changing curve of the true oval. This should not be overlooked, even in what may be classed as cheap work, for the sake of a little easier way of arriving at the construction of the work regardless of the after-effect.

**To Remove Rust from Steel**

Cover the rusted part with any non-drying oil or fat. Allow this to remain about three or four hours, then wipe off with a clean dry cloth. Now mix four ounces of opodeldoc and two drams of caustic potash. Apply to the part rusted, and after ten minutes wipe off with a dry cloth. Another method is to rub the rusted part well with sweet oil, and allow to remain until the next day; then sprinkle over it powdered quicklime and polish with this until the rust is gone. Still another way: mix one-half ounce of powdered emery and one ounce of soft soap. Rub this in well.
THE season of the year is rapidly approaching when many of the readers of this magazine will be called upon to construct cold storage rooms for meat, fruit, etc., for use during the warm weather.

Articles dealing with this matter have appeared from time to time in these columns and, judging from the number of letters received from correspondents, it appears that there is a further demand for information as to the planning and construction of simple ice house for storage purposes. Mr. J. Hatfield, of Arlington Heights, Mass., writes as follows: "Would like to know the best way to build a refrigerator for a meat store; size 8 feet wide, 10 feet deep and 10 feet high. It should be so arranged that when the door is open the warm air will not be direct on the ice; must have proper circulation of air so that the meat will keep dry and also be so made that the ice will be overhead and put in from the side. Can it be built of 2 by 4 sheathed two sides and filled with shavings? Would that be sufficient to make it tight?"

Also would like to know the best way to build a corn-beef tank so as to use the drip from refrigerator to circulate around it and keep the beef cool."

The several articles on refrigerator construction which have appeared in this magazine all dealt with separate outdoor structures, but there is a considerable demand for refrigerating room which can be placed inside a store or in a room at the rear. This article and its illustrations will therefore deal with the construction of an indoor room of a simple type.

In the first place, the insulation suggested by Mr. Hatfield would not be quite satisfactory; instead of building the sides and top of 2 by 4, sheathed on both sides, it would be very much better to provide two dead-air spaces by having three layers of sheathing, with pieces of 2 by 2 between, as shown in the sectional views. Authorities differ as to the respective merits of packing the spaces between layers of boarding with some insulating material or simply leaving them as dead-air spaces. There is little doubt, how-
ever, that for the small refrigerating room, properly formed and tight, dead-air spaces are quite satisfactory and are not as liable to absorb moisture or harbor insects as if packed with sawdust or shavings.

Fig. 1 is a vertical section taken from front to back of the room, and shows the ice floor well sloped towards the back. The ice floor is carried on joists of 2 by 6, as the blocks of ice are heavy and are, moreover, likely to be dumped in none too gently. On these joists, matched boards are laid and on the top of the boards strips of 1½ by 2 to form drains for the water running from the melted ice. All around the main walls of the ice chamber short pieces of 2 by 2 are nailed vertically about 1 foot apart and on these strips 1-inch boards are nailed to within 10 or 12 inches of the ceiling. These serve to keep the ice from the walls and form flues for the circulation of the air between the ice and meat chambers. A sharp fall is given to the ice floor, not only for drainage purposes, but also to help the circulation. The warm air from the meat will seek an outlet at the highest point near the front of the house and pass upwards through the air spaces to the surface of the ice and thence down again at the sides and rear end to the meat chamber.

Fig. 2 is a cross section showing how the joists are carried on pieces of 2 by 2 nailed to the inside of the side walls; and also shows the side boards and air spaces in the air chamber. Of course, the side boards would have to be loose at the ice door, but that is an easy matter to arrange.

The top of the refrigerator is formed with two dead-air spaces, like the walls, and needs no special remarks. The greatest of care must be taken, however, in fitting the angles of the walls and also the angles between the walls and top, for any slight leaks or open joints may set up a circulation of air and spoil the non-conducting properties of the air spaces between the layers of boarding. As an additional precaution, it is strongly recommended that a layer of good, stout sheathing paper be placed under the outer boarding, and well lapped and tacked around the angles.

The doors should be of several layers of matched boards with paper between the two outer layers. The openings should be rabbeted as shown in the drawings, so as to have several surfaces for the doors to close against, and thus prevent any circulation between the refrigerator and the outer air.

For a room of the size shown, a window in the rear end would be a convenience if light is available in that position. If a window is inserted, it should have triple sashes closely fitted and well fixed with stops nailed around each sash.

The water from the ice floor should be received in a half-round galvanized iron gutter fastened on the side of the last joint, as shown in Fig. 1, and led to a down pipe at one corner of the house. If it is desired to utilize this cold water for cooling a salting tank, as suggested by Mr. Hatfield, an outer tank or skin should be built to contain the salting tank; a space of 1½ inches being left between the tank and the skin. The water should enter this space from the down pipe at one side of the tank and pass off through an overflow pipe at the other end. The overflow pipe should be provided with a trap to prevent the admission of air to the refrigerator and be led away to some convenient sink or drain. An ordinary S lead trap with a clean-out plug is best, as drip water from ice usually fouls pipes quite rapidly and necessitates frequent cleansing. This also applies to the cooling space, which should be scrubbed out occasionally.

The woodwork in the food chamber should be thoroughly varnished with several coats of good grain shellac, well dried between each coat. The whole of the outside should be painted a dead white and kept clean by frequent washing.

Window Ventilation for Hen House or Barn

Last summer I made fifteen window frames, as per cut, enclosed, for a hen house. Frames were made two abreast, for roosting rooms, and three abreast for scratching sheds. Blind stops were about 2½ inches wide, so as to nail half onto studding, then the siding was run against the blindstop, which makes a better joint when casing is put on. At the top, I use no blindstop, other than letting drop siding project below. This also makes it better, because the water cannot easily run through. The 1½ strip is of same width as the thickness of sash, just to hold it up and act as a back for lower sash to rest against when shut. The “stop” may be a piece of lath or any thin board. The bottom of frame, 2 by 6, is grooved for tongue of drop siding, 5/16 groove. This is where it comes handy to have a gainer run by gasoline engine. I cut the rabble for lower sash with the same machine, which is adjustable to ¾ inch, or if I must have a groove ¾ or so, I place thin cardboard washers between each cutter blade. The rabble can also be cut quite exact by using a fine gauge circular saw and cut one side at a time. This makes two operations, but beats using the plane by hand. If rabbits need smoothing up, then the plane comes handy, that is if you have ripped the rabble instead of using the gainer. The lower sash is fastened with small butts, and tilts inward to allow for ventilation.

A. O. STIEN.

To prevent the rusting of screws used for joining machinery, whereby they become fixed, it is recommended that the screws be dipped in graphite mixed with a non-drying oil, which will prevent any rusting for years. It also facilitates the tightening up of the screws.
Ornamental Glass and Its Use

THE DEVELOPMENT OF THE INDUSTRY IN RECENT TIMES AND THE DESIRABILITY OF A GREATER USE OF ART GLASS IN GENERAL BUILDING

By Walter H. Helmerich

THERE is a certain conservatism among builders generally, especially among those outside the large cities, concerning the selection and the use of building materials. From long course of habit the “old standbys” are specified and used—sometimes to the advantage of the job and the owner, it is true—while other, newer materials, whose uses are not so generally known, might have been employed more economically and to much better effect. Art or ornamental glass is one of these materials.

It is safe to say that ornamental glass ought to be used much more freely in ordinary building than is now the case. One of the largest promoters of building improvements in Chicago, in a recent conversation with the writer of this article, stated that he found greater return for money invested in the art glass on his buildings than on any other line of ornamentation; saying that by spending fifty to seventy-five dollars for art glass on a flat building, cottage or bungalow he not only disposed of them more rapidly, but also frequently received several hundred dollars more for them than for houses built in the same style and manner with plain glass only. As this gentleman has at present about two hundred buildings under way, or in contemplation, in Chicago and vicinity, his opinion is worthy of consideration.

The use of ornamental glass for church windows and for various public buildings is, of course, familiar. Neither can this be called a new product, since the craftsmen of the middle ages were masters of the art of stained glass, passing on down to us moderns many of their methods. But ornamental glass is now used in more than public buildings. Improved methods of manufacture have now brought it within the reach of builders for ordinary residence work. Special designs have been made, especially suited to houses and the smaller class of work.

Not long ago a committee of the manufacturers of ornamental glass met in Chicago for the purpose of compiling a catalogue of art glass designs. They represented the largest and best equipped establishments of the east, west and central portions of the United States, and had designs from almost every reliable manufacturer in the art glass industry. These were submitted for selection by this committee. The purpose of publishing this catalogue is to advance the standard of work.

Not only will this be the most complete catalogue of its kind ever published, embracing the best ideas of all sections of this country and the work of the highest-grade artists in the profession, but it is not distributed alone to members of the organization, it having been decided to place it at the disposal of any reputable manufacturer or jobber. This is an evidence of the growing spirit of indeed making the art glass industry one that will make this country what it should be, a leader among nations in all lines of manufacture. Heretofore it has been said that we have to go to Europe for the highest grade of work in this line; but the writer, without hesitation, affirms that there is not a piece of work in the line of decorative art glass which cannot be duplicated here in our own country, and in many instances our methods are far in advance of those in use in European factories.
Modern House and Bungalow Designs

WITH the opening up again of the spring building season in all its activity and with the recurrence of the annual spring “moving day,” house renters in all parts of the country are turning in great numbers to the subject of home-building, and are giving the matter much thought. For these people, building plans are of the greatest interest. Minute details of the design and arrangement of houses take on an importance they never before—to them—possessed. Some are ambitious to build a fine suburban place with lawns and shrubbery; others are interested in the compact inexpensive bungalow; all want modern conveniences and well-planned designs.

A number of house plans are presented this month, each well-designed and typical of its kind; as a whole they represent a wide range of styles.

The first is designed in the English period, to be built of frame, plastered on the outside and decorated with half-timber work. The piers forming the front of the piazza and supporting the roof above have been thickened to give an appearance of solidity. The construction might be improved if these were built of brick, offering firmer support for the overhanging...
roof and floor above, or solid concrete would be good.

The interior is spacious and well-balanced, on account of the stairs, hall and living-room being divided by columns rather than a solid partition. At the end of the hall the small alcove answers the purpose of a reception-room as well as being a decorative feature. The wide entrance to the dining-room also adds to the effect of spaciousness. Direct access is obtained to every part of the house conveniently. The kitchen has no outside porch but is reached by a side door which leads to a grade entry and thence by four steps to the main floor. From this grade entry, a flight of steps passes to the cellar under the front stairs.

Every inch of space is utilized to the best advantage in this house. The second floor contains five splendid chambers of more than ordinary size, and there is considerable available space in the attic which could be used for storage, a playroom or sleeping-rooms. The owner's chamber is large enough to permit the addition of a private bath. With simple interior trim, hardwood floors and good plumbing and fixtures, this house is estimated by the architect, A. R. Ellis, of Hartford, Conn., to cost about $8,000.
A Desirable Bungalow

No collection or assortment of building plans would be at all complete today without the bungalow being well represented. The accompanying plans show one that especially recommends itself, and for a number of reasons. The exterior is artistic and attractive, and is at the same time sensible. It presents a very substantial appearance and is, in fact, a very well-built little house. Shingles, stained, or narrow weather-boarding is the exterior finish.

The interior of this bungalow shows an interesting plan. The living-room is large, 16 feet by 12 feet 6 inches, besides two large alcoves off from it, one serving as an entrance-hall and the other as a dining-room. Two nice bedrooms are provided. The bathroom is easily accessible from all parts of the house. The space under the roof is left unfinished, but windows are provided on three sides to take care of ventilation. This makes the house much cooler during the hot weather—removing one of the faults sometimes found with the cottage style. The cost complete with modern plumbing is estimated at $1,800.

A Brick Veneer House

The design shown on the next page is that of a brick-veneer house, recently erected for Mr. J. W. Menlove, at Lincoln, Neb., after plans and specifications prepared by Woods & Cordner, architects, of that place. This kind of a building, when properly erected, has all of the appearance of solid brick walls and, when the framework is properly constructed, makes as substantial a structure as when the all-brick construction is used; besides it has some advantage in preventing dampness from penetrating the inner walls.

This is a very convenient and inexpensive house. It has a large central hall with the four principal rooms well arranged with reference to it. The dining-room and living-room have large bay windows, which furnish an abundance of light. Large openings with sliding doors give access between the principal rooms. The large porch, extending across the front and circling the corner, adds much to the appearance of the house and to the comfort of its occupants.

The second floor contains four good-sized bedrooms, all provided with closets. The bathroom is located near the head of the stairs with opening from the hallway. This floor also contains a sewing-room at the opposite end of the hall, where the sewing machine and other appurtenances thereto may be kept in readiness without having to use other rooms.

A box stair leads from the hall to the attic, which is floored but not otherwise finished. A balcony over
The side porch furnishes a splendid place for sunning purposes.

There is a basement under the entire building, divided off into the usual rooms for cellar, laundry, furnace and fuel rooms. The house is heated with hot water and contains modern furnishings throughout.

It is supposed that the first nails were the thorns of the locust tree, some of which are eight inches long and as hard as iron. The use of fish bones was common before Noah's time, and in all probability the first of the commodores built his raft scow with them.

They were as long and strong as our metal string bolts. Wooden pins were employed also, being driven through holes burned by hot irons before there were crude augers to bore them.

We smart Americans were cutting iron nails by machinery 100 years ago at the rate of 100 a minute to the machine. The great wire nail industry started in 1886 and is now of colossal importance. Before cut nails were introduced all nails were hand forged.

![First Floor Plan – Brick Veneer House](image1)

![Second Floor Plan – Brick Veneer House](image2)

Brick Veneer House, Residence of J. W. Menlove, Lincoln, Nebr., Woods & Cordner, Architects

![Image of Brick Veneer House](image3)
Two Desirable Pieces for the Hall.

COMPLETE DETAILED INSTRUCTIONS WITH WORKING DRAWINGS SHOWING HOW TO MAKE A HALL CLOCK AND A HALL TREE OF PLEASING DESIGN

For the hall clock described herein there will be needed the following pieces. Order them mill-planed and sandpapered as indicated in the stock bill. S-4-S and S-2-S are abbreviations that will be understood at the mill as meaning surfaced or sized or smoothed on four or two sides respectively. Quarter-sawed white oak makes up nicely. It is generally carried in stock by most dealers and takes a beautiful finish. Plain-sawed red oak is very appropriate for Mission design such as these:

- 4 posts 1 1/4 by 1 1/4 by 6 feet 1 inch. S-4-S.
- 3 rails 1 by 4 by 15 3/4 inches. S-4-S.
- 4 rails 1 by 4 by 10 1/2 inches. S-4-S.
- 1 rail 1 by 2 by 15 3/4 inches. S-4-S.
- 1 rail 1 by 1 1/2 by 15 3/4 inches. S-4-S.
- 2 rails 1 by 2 1/2 by 10 1/2 inches. S-4-S.
- 1 stile 7/8 by 1 1/2 by 48 3/4 inches. S-4-S.
- 2 panels 3/4 by 7 by 48 3/4 inches. S-4-S.
- 2 panels 3/4 by 9 3/4 by 14 3/4 inches. S-4-S.
- 1 panel 3/4 by 14 3/4 by 14 3/4 inches. S-4-S.
- 1 top 1 1/4 by 16 by 22 inches. S-2-S.
- 2 brackets 1 3/4 by 2 1/2 by 4 inches. S-2-S.

Stock for the box which is to contain the movement should be made of 3/4-inch yellow poplar. The size and construction of the box will depend somewhat upon the kind of movement that is to be used. Ordinarily there will be needed:

- 2 pieces 1/2 by 6 by 16 1/2 inches. S-2-S.
- 2 pieces 1/2 by 6 by 7 inches. S-2-S.
- 1 piece 1/2 by 8 by 8 inches. S-2-S.

Begin work by squaring the posts to length. Place them side by side and lay off the mortises and the auger holes for the lag screws. Chisel these mortises and bore the holes. The tenons are to be stub tenons—about 1/2 inch long—so that the mortises need not be cut much deeper than 1/2 inch. These stub tenons hold the rails from turning, the lag screws giving the strength needed. A 3/4 by 2 1/2 inch lag screw is a good size to use. There will need to be a smaller hole in the end of the rail than is bored in the post—3/16 inch is about right. It will be well to have a few of the screws 3/8 inch longer than the others, to be used in case the shorter screws should strip the wood threads because of over wrenching.

Lay off the tenons of the rails and cut them. These rails are all 1 inch thick and will stand shouldering on the four sides of each end. Three-eighths or 1/2 inch is a good thickness. The location of the holes in the ends of the tenons can best be obtained after the tenons are fitted into their mortises.

Flow the rails and posts for the panel grooves. Cut and fit the panels and then assemble the whole, gluing the tenons before inserting the lag screws.

The top may now be squared up. It has a 3/4-inch bevel on the front and ends. Fasten it in place, nailing down into the posts.

The two brackets are easiest got by squaring a piece to 2 by 3 inches and 3/4 inch long, then ripping diagonally. Plane these surfaces smooth and put on the
ornamental groove as shown in the photograph. Fasten the braces with light brads, covering the heads with putty colored to match the finish.

The face or dial may be either of wood or of heavy copper. Whichever is used, there will be needed four corner blocks fastened to the rails into which screws through the face can be fastened.

![Diagram of a Hall Clock](image)

**FIG. 1. HALL CLOCK.**

Bronze figures for the dial have two prongs each, which are put through face and clinched on the back.

The size and shape of the box for the "works" will have to be determined after they are purchased. In general there will need to be two verticals fastened top and bottom to the front rails of the frame, as indicated in the drawing with two horizontals, the lower so placed as to bring the pinion to the center of the dial, approximately. Hooks with nuts are furnished that permit the fastening of the "movement" to the bottom horizontal. They are long enough to permit of a little "blocking up" if the pinion is too low. A back is needed to keep the dust out. Like the front, it should be fastened with screws so as to allow easy access to the movement.

The adjustment of a clock is rather delicate, and if the clock is out of level the ratchet will not release properly, hence the clock will not "run."

To permit of the adjusting of the clock frame to uneven floors, bore and insert four lag screws—large-headed ones—in the lower ends of the posts. The clock frame will rest on these and may be turned at will so as to "take up" any unevenness in the floor.

As for the finish, a dark effect will be most appropriate for this design. A water stain, sanded lightly when dry, followed by a dark filler, colored to match the stain, and this when dry by several coats of wax, makes an easy and satisfactory finish.

### How to Make a Hall Tree

A companion piece for the hall clock is the hall tree, Fig. 2. For this will be needed the following:

- 1 post 2 by 2 by 6 feet 2 inches. S-4-S.
- 4 feet 1½ by 4½ by 11½ inches. S-2-S.
- 1 base 2 by 11 by 11 inches. S-2-S.
- 4 braces 1½ by 1½ by 6 inches. S-4-S.
- 8 pegs 3¼ by 3¼ by 6½ inches. S-4-S.

The post may be made first and the V-shaped grooves cut as indicated on the drawing. Next make the base as detailed. The hole in the center is for the lag screw which holds the post to it, and should be 3/4 inch in diameter. In the end of the post should be bored a ¾-inch hole, also for the lag screw. A ¾ by 3¼ or 4 inch screw will be needed.

The four feet are to be shaped as indicated in the drawing. Angles of 30 degrees and 60 degrees are easily obtained. Hold the beam of the bevel against either the blade or tongue of the steel square. Adjust the blade of the bevel so that it shall be the hypothenuse of a right-angled triangle in which its length shall be twice that of one or the other of the sides of the triangle made by the edges of the blade and tongue of the square.

The braces are cut at angles of 45 degrees to the length indicated. The pegs have their mitered ends cut at an angle of 60 degrees. They may be fastened to the post by dowels, but a better way is to cut them...
long enough to "tenon them in." There will be consider able "prying" on them and they should be "set in" as far as is possible.

Time will be saved and a better finish result if the parts are stained and filled before putting them to-
Chicago Building Trades Apprentice School

INDUSTRIAL EDUCATION APPLIED DIRECT WHERE IT WILL DO THE MOST GOOD—A NOTABLE EXAMPLE OF FORESIGHT AND PROGRESSIVENESS

In the midst of all the controversy and the discussion pro and con over the question of industrial education in our public schools, a school has been established in Chicago and conducted now for five years—so it is no longer in the experimental class—which cannot fail to meet the approval of everyone. This is the Building Trades' Apprentice School. It gets right at the heart of the industrial training question by teaching those boys and young men who are actually engaged in the practical work of the world, the building trades apprentices.

This school was established and is maintained by the journeymen carpenters and by the carpenter contractors, working together to give the apprentices a better training and so make them more efficient workmen. The school is in session for three months each
winter. During those three months enough of "theory" and book explanation is given to properly balance the other nine months of practical training "on the job." During those three months in school each year the boys receive their regular weekly wages just the same as though they were at work, the contractor or builder to whom the boy is indentured paying him.

In the session of this year, just closed, nearly 300 young men have been in attendance; about two-thirds of them are carpenter apprentices, one-third bricklayer's. All apprentices of these trades in the Chicago district, whether affiliated with any organization or not, are supposed to attend.

The course of study centers around architectural drawing, with mathematics as a close second. Considerable attention is given to spelling and penmanship as these are essential to all lines of education. As a rest from long periods of drawing and mathematics, geography and history are taught in a minor degree. The work in mathematics is such as is necessary for a man to know in order that he may specify and estimate as well as handle such accounts and problems as must naturally arise in general as well as in his particular line.

The city school board supplies the building, equipment and teachers for this school.
HAVING in mind an Irish bull, which was thought familiar to all, the writer entitled the preceding article of this series "The Works of a Buzz-saw." While the change of title by the editor was truly a vast improvement, it seems a pity not to dwell for a moment on the world of suggestion in Paddy's expression: "It's wonderful, the works of a wheelbarry, when it's well wrought." In the speed of modern automatic production, and in the wonders of automatic machinery, we are apt to consider too lightly the possibilities which skill may develop in the simpler ones. As, in our awe of big guns, we are prone to forget "the men behind the guns"; so are we apt to think more of the machine than of its manipulation. The writer once stood for hours, agape at the wonders of a brussels carpet loom, before he gave thought to the men who brought about its upbuilding by doing just such work on the crudest of machines. Wonderful indeed are the capabilities of any simple machine "when it is well wrought." Hence, it is well, before investing in elaborate special machines, to give careful thought to what may be done with the simpler ones—more to use and get acquainted with them; for "one never knows till he tries."

After the buzz-saw, perhaps the buzz-planer is the most generally useful and essential machine for the small plant. For some reason it seems to appeal but little to the uninitiated, and one rarely appreciates it till he has used it; but it is capable of wide application in general job work, and one has to use it but a short time till he feels that he cannot get along without it. True, this is somewhat apt to be the case with any machine; but it seems especially so with the buzz-planer.

As the primary use of such a machine is for jointing, rigidity is perhaps an even more essential feature for it than for other machines, so one should beware of too many adjustments. Be it said, however, that there appear to be no buzz-planers on the market with adjustments which are necessarily detrimental; though, as with most other machines, the demand for something cheap tends to incline some makers to too great economy of metal. As a rule, one wants all the adjustments he can get; being ever watchful that they are not so made as to weaken the machine.

The cylinder should be long enough to plane the widest work likely to be brought to it, and should be slotted on four sides. Even if the bulk of the work is narrow one can use the whole length of the knives by setting the fence at different points for different job. In following this method it is better to use the back end first; thus leaving the front end and corners sharp as long as may be, for the occasional job of rabbeting. By having the four sides slotted, even though one may never want to use anything but the regular straight knives on two of them, he is able, on occasion, to slide one knife end in a trifle; and to so get rid of a part of the ill effect of a bad gap, and to postpone the evil day of grinding. Such postponement is not procrastination, for the removing and resetting of knives is an item of moment; taking as much time in the case of short knives as in that of long ones. Also, with the four sides slotted, and with a small stock of knife blanks, one may "make a stab" at making moldings. Indeed, it is often more economical to work a short piece of an odd style on a buzz-planer than on a molder.

Another feature of considerable importance is to have the cylinder as small, and the throat opening as narrow, as may be. Though the danger of dropping in a finger or hand is quite largely eliminated by the guards so commonly advertised and used nowadays, still a wide throat remains a yawning chasm tending to produce an aching void where one's fingers were. Theoretically, perhaps, it is true that a larger head will do smoother work; but practically the gain in this respect due to a larger cutting circle is more than offset by the impracticability of properly balancing a large head.

The first "Woodworth" planers had cylinders (or knife-carrying frames) 16 inches in diameter; but it was soon found that smaller ones did the work better. If one has been made too small, the writer has not seen it. So far as safety is concerned, the size of the cylinder on a surfacer has little bearing; but in the case of a buzz-planer, it is an important item, which should not be overlooked.

Buzz-planers are usually arranged so that the front
end of the knives may be used for rabbeting; and that end of the knives should be ground to a slight bevel, in order to give good clearance and insure a smooth cut on the back of the rabbet. If the head is slotted on four sides, however, it is often advantageous to use a supplementary pair of knives for this purpose. By placing these sufficiently well back on the head, with projection sufficient for the depth of the rabbet, the stuff may be jointed and rabbeted at one cut. Of course chamfering and beveling are within the regular line of work of the machine; and one is also constantly finding it nicely adapted to an endless variety of jobs.

Much has been said of the danger in operating buzz-planers; and there is danger— to the careless operator. As due care in operation tends rather to increase than to diminish the output of any machine, it is well, besides having the best safety appliances available, to know how to take care. As there is only one point in the buzz-planer of serious danger, and that is the point where the work is done, it would seem that one ought to be able to keep his fingers out of it.

In setting up, always make the throat as narrow as is compatible with the work in hand; for thus better work is done, and the zone of danger is made narrower. In running small stuff, the habit, easily acquired, of hooking the little finger over the top of the fence, tends to safety. With long and slender sticks, it is well to have a bench or table to support the end after it runs off the machine table proper; for many, the good finger has been lost by such a stick turning from under it. Also, with such stuff, it is well that the right hand should be taken off the extreme end just before it reaches the knives; the cut being finished by pressing the moistened finger on top of the stick, ahead of the knives. Thus, if the end happens to be cross grained and to sliver off, a thumb is likely to be saved.

The suggestion that a wide machine is preferable, and that the back end of the knives be used first, plainly implies the desirability of a guard. A guard is desirable; yet one should not become too dependent upon it. There is no occasion to put one's fingers on the cylinder when it is running; and one should learn to keep his fingers above the table under all circumstances. While the writer has only approbation for all practical safety devices, he greatly reprobates the need of them.

**Hoisting Ropes and Pulleys**

EASILY REMEMBERED RULES FOR DETERMINING THE STRENGTH OF ROPES AND CABLES OF DIFFERENT SIZES—MECHANICAL ADVANTAGE OF THE PULLEY

By T. B. Kidner

Among the many valuable suggestions for articles likely to be of interest to our readers which have come to hand lately from our correspondents, is a request for an article dealing with the strength of rope gearing, particularly the guy lines and hoisting gear of derricks and similar appliances. This is an important question, especially in view of the appalling loss of life amongst workers caused by defective ropes, chains and other hoisting gear.

Most of the engineering pocket books give tables of the strength of ropes which have been deduced from experiments made either by government investigators or leading scientific engineers. The following particulars are taken from a published table which provides for a safe load for ropes in tons of 2,000 pounds:

<table>
<thead>
<tr>
<th>SAFE LOADS IN TONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>For common hemp rope</td>
</tr>
<tr>
<td>For iron wire rope</td>
</tr>
<tr>
<td>For steel wire rope</td>
</tr>
</tbody>
</table>

D² means the diameter of the rope squared, that is, multiplied by itself. For example, a hemp rope of 2-inch diameter would give 2²=4, and 1/3 of 4 is 1 1/3, that is, 1 1/3 tons for the safe working load of a rope of 2-inch diameter.

Or, if an iron wire rope of 1/2-inch diameter be taken, we get 1/₂²=1/₄ and 1/₄X8/₃=2/₃ of a ton for the safe working load. A steel wire rope of the same diameter gives a proportionately greater result, by the table, as follows: 1/₄X2=1/₂ and 1/₄X14/₃=1 1/₆ tons for the safe load.

This little formula is not difficult to apply and keep in mind if it be remembered that it is the square of the diameter of the rope which must be taken. This is important, for it will be recalled that in purchasing ropes the nominal size always given is that of the
circumference. Thus, a 3-inch rope means a rope of 3-inch circumference, but only 1 inch (nearly) in diameter, and an 18-inch manila (hemp) hawser is only 6 inches in diameter.

Another important point to consider in connection with hemp ropes is that there is considerable loss of strength in them from wear, tear and exposure to the weather during a few months' working. In Anderson's standard tests he found great variation between the strength of apparently good rope which had been used for a time and of new rope of the same size and make. A piece of 6-inch Italian hemp rope, after working, gave 10½ tons only, as against a breaking strength of 14½ tons for new. An old piece of 6-inch Russian hemp rope broke with 5½ tons, while a new piece of the same rope required 11½ tons. This rapid deterioration in the strength of hemp ropes is one of the main causes which have led to the general adoption of wire ropes for hoisting purposes in modern practice, for a good wire rope may be used for a long time with little or no loss of strength.

Hemp ropes are still used almost universally for slings, and as the breaking of these is a frequent cause of serious accidents and deaths, it may be worthy of note that the ordinary form of doubled sling (usually a spliced loop) does not give double the strength of a single rope under a test, as might perhaps be fairly expected. If, however, an iron thimble be used in the end of the sling where the hoisting hook is inserted, a sling will generally stand double the strain of a single rope.

It may be well to mention, however, that although, as stated above, most engineering books give rules for finding the strength of ropes, some authorities do not place much reliance on them. Trautwine goes even further and says: "The common rules for finding the strength of rope by multiplying the square of the diameter or circumference by a given co-efficient are entirely erroneous." He places great confidence on the tables published by the leading manufacturers of ropes, especially the wire rope makers, and it is probable that, speaking generally, the manufacturers' tables of strength are the most reliable guide.

But one cannot get very far in considering the strength of ropes for hoisting purposes without coming to the mechanical advantage gained by the use of movable pulleys or blocks. Every practical man knows the advantage gained by using a tackle composed of a pair of blocks instead of a single pulley for hoisting heavy weights; one man being able to hoist very heavy loads by employing, for instance, a three-sheave and a two-sheave block properly rove or threaded.

The principle by which this mechanical advantage is gained is quite simple and may be demonstrated by means of a few diagrams so as to be readily understood with very little study. Fig. 1 shows the simplest arrangement of a pulley for hoisting purposes. It is quite evident that in this case the force or pull on the rope must equal the weight and the only advantage gained is that the direction of the pull is more convenient for hoisting the weight, and there is no gain of force. In fact, there is a slight loss of force owing to the friction of the rope on the pulley, but the convenience of the direction of the pull more than compensates for the loss by friction.

But supposing that a movable pulley is inserted as in Fig. 2 and one end of the "fall" or rope is made fast as shown. It is clear that one-half the weight is borne by the rope at A and one-half by B, and that therefore the pull or force required at P will be just half the weight, or, in other words, the mechanical advantage of such an arrangement is 2. But as it is a universal law of nature that one cannot get something out of nothing (or for nothing), there is a corresponding loss in the rate of hoisting, the weight being lifted only half as fast as the part P moves.

Fig. 3 shows a tackle composed of a pair of blocks, the upper having two sheaves or pulleys, and the
lower block one pulley. In this case the pull or power required at P is only one-third of the weight. In other words, the power required is equal to the weight to be raised, divided by the number of pulleys round which the rope passes. Or to put it yet another way, which is just as easy to remember, divide the weight by the number of parts of the rope, not counting the free or pulling end, and the result will give the pull or force required.

This rule may be applied whatever the number of pulleys may be, a four-block and three-block tackle as in Fig. 4 giving a mechanical advantage or gain in

![Diagram of pulley system](image)

force of \( \frac{1}{7} \); that is, the pull required will be one-seventh of the weight to be hoisted. Of course, the friction increases with the number of pulleys and the actual force required would be one-seventh of the weight, plus power enough to overcome the friction. Otherwise the weight would be just balanced, or, as the scientist would say, in equilibrium, if exactly one-seventh the weight were applied as the pulling force.

The question is sometimes asked as to the proper arrangement of pulley blocks; that is, whether or not it is necessary to have one more pulley or sheave in the upper block than in the lower. While this is by far the most common arrangement, it is by no means universal, and a tackle arranged with an equal number of pulleys in the upper and lower blocks is quite correct. In this case the mechanical advantage is 8; that is, the weight can be divided by 8 to give the force or pull required on the free end of the rope at P.

The relation of this matter of pulleys to the strength of ropes should be obvious, for it is clear that if the pull or strain on the rope is lessened by the number of pulleys over which it passes, a much lighter rope can be used by increasing the number of pulleys.

At the same time it must not be forgotten that every advantage gained in force by the use of pulleys is at the expense of speed. While the weight in Fig. 4 can be hoisted with a pull equal to one-seventh the weight (plus the overcoming of friction) yet the rate of movement of the weight is only one-seventh the rate of the free or pulling end of the rope.

+ No Race Suicide Here

Fra Torro McRaye relates that while he was clerking in a shoe store in Quebec the following order was received from a worthy habitant:

"Monsieur, please put some shoe on my leetle family, like dis, and send by Sam Jamison, de carrier:

"One man, Jean St. Jean, thirty-nine year, me; one woman, Sophie St. Jean, thirty-eight year, she; Hermedes and Leonore, nineteen year; Honore, eighteen year; Celine, seventeen year; Narcisse, Octavia and Phillis, sixteen; Baptiste, fifteen; Celeste, fourteen; Philippa, thirteen; Emile and George, twelve; Babette, eleven; Madore, ten; Pierre, nine; Eugene, we lose him; Paul, seven; Alphonse, six; Gaston, five; Armand, four; Maurice, three; Edouard, two; Muriel, one year; Hilare he go barefoot. How much?"—The Fra.

+ Folding Monkey Wrench

Nowadays almost every sort of a tool is made so that it can be folded up into a small compass when not in use. One of the most useful of these is a folding monkey wrench which has been invented by an Indiana man. This implement is especially convenient for plumbers and automobile drivers, but many other people will find it valuable, as it can be dropped into a handy pocket or hung upon a nail or any other projection that is within easy reach. The wrench has a handle which works on a pivot. When not in use the handle folds over one side, like the blade of a jackknife, and when the tool is in operation it is opened out to its full length. The jaws work by means of a screw, as in an ordinary wrench, but this screw has a nut mounted upon it which fits into slots on either side of the handle. When the handle is open the nut keeps it rigid and when it is closed the nut fits into the slot on the other side and keeps it closed. At the other end of the handle is a ring by which the tool may be hung up.
Compact Horse and Cow Barn

THIS barn has been designed and arranged at the request of one of our subscribers, James E. Weaver, of New London, Ind., to meet certain special needs, as explained in the following letter:

"I would like to know about what size to build a barn so as to give stables for ten head of horses and ten or twelve cattle. It should also have a driveway so that a load or two of hay could be protected from a storm, if such should come up while harvesting. The hay is to be taken up at the end of the barn."

This design seems to fulfill all these conditions in a very satisfactory way. The barn is 38 feet wide by 54 feet long. It is intended for a level site—no basement to be used. A driveway extends straight through the barn and is ceiled over high enough to allow a full load of hay to be handled without difficulty. The ceiling over the horse and the cow stalls is not so high.

To suit many locations this design would doubtless be improved by cutting another doorway in the front, in line with the passage back of the horse stalls. Hinged boxes for grain and feed could be arranged along one side of the driveway.
Desirable Six-room School

PERSPECTIVE AND FLOOR PLANS OF A MODERN SIX-ROOM SCHOOL DESIGNED IN COMPACT, ECONOMICAL AND CONVENIENT FORM

The problem of designing a 6-room school building that is conveniently arranged and is at the same time of economical construction and without waste space is one that has given architects a good deal of thought. To obtain the greatest amount of room with the least expense for foundations, outer walls and roofs, a building of square or nearly square plan is desirable. So the problem resolves itself into arranging the three class-rooms on each floor, together with necessary hallways and stairs, into a desirable square plan.

The accompanying design by Geo. W. Ashby, architect, meets all the requirements in a very satisfactory way. There are two entrance-ways, with broad stairs leading to the central corridor. A small office for the principal occupies the strategic position in the corner between the stairs. The corresponding space on the second floor is put to good use as a library. The class-rooms are very well lighted and ventilated.

The exterior appearance of this school is dignified and pleasing. The material to be used is red brick, trimmings of stone, and slate roof.

Decay in Building Stone

The causes of decay in building stones are various
and depend on the physical structure of the stone, its composition and the nature of the surrounding atmosphere. The most destructive agent to which the stone is exposed is rain or a moist atmosphere, and also, in a minor degree, wind, frost and smoke. The air of large towns is usually charged with various deleterious acids; these acids are dissolved by the rain, which penetrates the stone in a greater or less degree, according to its physical structure, and combines with the constituents of the stone, causing it to decay. So that any contrivance that will check the admission of water will be most likely to succeed in arresting decay.

Why We Move

Any change in the dollars and cents of life means usually that the modern American family will move. When we get rich, we move. When poverty threatens, we move. When the land on which our house stands rises considerably in value, we move in order to invest the profits; and when it falls, we move because "the tone of the neighborhood is no longer what it was."

We move for many other reasons. When we marry, of course we move. Sometimes we marry in order to have a plausible reason for moving; and sometimes, when our children marry and go away from home, we move "because the old home seems lonely." Nearly every divorce means that two must move. When the parents die, the children move. As the family grows in number, we move into a larger house in order to have more room; and, when we can, we move into a better neighborhood in order to give the children social advantages. When unwelcome faces appear upon our street, we move; and when our friends move away, we move. When the landlord raises the rent or refuses to make repairs, we move.

Almost any event is a good enough reason for an American family to move. Some of us own two or three different homes, in city, in country and by the sea; and thereby have an assurance of the delight of moving several times a year. And some of us live in hotels or in boarding houses in order to be "foot-free" to come and go as we will.

One Way of Breaking an Emery Wheel

Some time ago the writer, for the first time in his experience, broke an emery wheel when it was running—indeed, it seemed that, to quote the small boy, it broke itself. As no sort of maltreatment was in evidence, as one of the flying pieces brought into the visual field of the operator more stars than a 26-inch telescope could bring, and as the wheel was made by a firm whose wheels the said operator had not used before; such pieces as could be found were carefully boxed and sent to the said firm of makers, with a letter which would not make good Sunday reading.

The sentiments expressed in the letter were rigidly adhered to until, some time later, another wheel broke in practically the same manner. As this one was made by one of the old and tried firms (perhaps the fact that none of the pieces made personal contact tended to a more judicial frame of mind) a more careful investigation was made. It was found that the wheel usually hung, when not in use, back of the machine, where the oil thrown from the bearing made a streak across it, directly through the center. The primary break was directly along the oily streak. As it happened in the latter case—doubless in the former, too—the wheel had been hanging in one position while the machine, with another wheel on, had been considerably used. While the writer is not prepared to positively assert that the oily streak was the cause of breakage, there was no other cause in evidence; and these were the only breakages in twenty-seven years' experience.
Practical Questions Answered

Edward Hurst Brown

Valuable Advice and Suggestions at the Request of Subscribers about Painting, Decorating and Wood Finishing

The difficulties and perplexities which one man meets in connection with his work are apt to occur to another man, and therefore, the writer may be pardoned in taking as the “text” for this article, some of the problems that have arisen in connection with painting and decorating work that has come under the charge of readers of the American Carpenter and Builder. Here, for example, is a contractor and builder of Rush City, Minn., who has been told by one of his customers that in Chicago calcimining is very successfully done over wall paper and asks how this is done.

Calcimining Over Wall Paper

In the first place, this is not good practice, as all walls should be washed off to the bare plaster before being re-papered or re-calcimined, as a sanitary precaution. Underneath the paper is a layer of paste and probably of glue size, also; and when these vegetable and animal substances are buried beneath several additional layers of paper or calcimine, they form excellent breeding places for germs and bacilli of all kinds. A layer of dirty wall paper, perhaps laden with the spores of some disease, is none the less dirty and dangerous because covered up with calcimine or a new thickness of paper. Moreover, calcimine is made with glue, which in time decays, as all animal substances will, and sanitary precaution would require that it should be washed off before a new layer of calcimine takes its place. Some of the prepared calcimines or cold water paints are made with vegetable glue and others with casein—the cheese part of milk—as a binder, and no matter how permanent and sanitary the lime base may be, this binder will eventually decay.

Again, it is very difficult in calcimining over wall paper to prevent the pattern of the paper from striking through. This is especially the case in a paper where strong red is used either as a printed background on white paper, or where red flowers or ornaments form a part of the design. Most wall paper manufacturers employ, especially in the cheaper grades of wall papers, a class of aniline red colors, known as para reds, which are reasonably permanent and of rich and beautiful color tone, but which have an unfortunate tendency to “bleed” through any subsequent coverings of paint, calcimine or wall paper. The best method of preventing this, or at least of partially preventing it, is to give the wall paper a coat of alum size, made by mixing melted alum—a “saturated solution,” or as much alum as the water will dissolve—in warm glue size. This gives a crystalline or glossy surface which stops suction to some extent, and permits the calcimine or water paint to flow over the surface more freely. Two coats of this alum size should be given.

The surface of the wall paper should be carefully examined before sizing, in order to see that there are no loose places and that the paper is firmly adhering to the wall. It would be worse than folly to attempt to calcimine over old, loose wall paper, because the moisture in the calcimine would tend to still further loosen it up and you would have your labor in vain. Indeed, in most cases, the saving effected by calcimining over old wall paper is so small as not to make it worth while.

The experienced painter, of the old school, prefers to make his own calcimine from whiting and glue water, tinted with colors ground in water—known as distemper colors. Great care must be taken to get the proper proportion of glue or the calcimine will crack and peel, and in summer ice must be used in order to produce the proper condition in the material. Very few journeymen painters, today, are able to mix a pail of calcimine, and the trade has therefore, very generally adopted the use of ready-prepared calcimines, put up in powdered form, and made ready for use by the addition of cold or boiling water, as the case may be. These materials are, to all intents and purposes, calcimine, being made from Paris white or whiting, with the requisite binding material, having the nature of glue. They are ready tinted, and moreover are much easier applied than ordinary calcimine,
which has a tendency to show laps, unless brushed on with the greatest smoothness, constantly keeping a wet or flowing edge.

**Natural Finish for Trim and Floors**

A house having yellow pine trim and birch doors was to be finished in the natural wood, and the builder, Tom DeKoster, of Hull, Iowa, wished to know how this should be done. The best way would be to give a first coat of shellac and follow this with two coats of a good brand of interior varnish. It is against our policy to recommend special brands, but we might say that there is practically no difference in quality between the interior varnishes or interior wood finishes made by any of the leading varnish manufacturers. These goods sell at an average list price of two dollars and a half a gallon, with the customary discount when purchased in case lots of twelve gallons. As it requires a special knack to apply shellac without showing laps, owing to the rapid drying of the denatured alcohol with which shellac is usually cut, many painters prefer to use three coats of varnish. The result is equally good, but an ordinary oil varnish will darken yellow pine to a certain extent, the color gradually deepening as time passes. This, however, is not objected to by many people.

For a cheaper finish a coat of a good quality of liquid filler may be followed by two coats of varnish. But the cheap liquid fillers that are nothing more than rosin varnish mixed with a little pigment base should be avoided.

As a finish for an oak or maple floor, a good floor varnish, and there are many of them on the market, will be very satisfactory, provided it is properly protected from hard wear by rugs and is taken care of by occasional rubbing with a good quality of polishing oil, or a floor oil, afterward wiping off with a dry woolen cloth. Milk may also be used for keeping a varnished floor in good condition. Of course, very little of either should be used. A maple floor, being close-grained, does not need a filler before varnishing, but an oak floor, having an open grain, needs to be first properly filled with a silex paste filler. This should be thinned to the consistency of stout varnish with pure turpentine, and applied with a suitable brush to a stretch of four or five boards wide by the length of the room. In from ten to twenty minutes, it will be set sufficiently to rub it across the grain of the wood with a bunch of tow, or excelsior, or a piece of burlap to remove the surplus filler from the surface, afterward wiping it with a soft rag. The floor should then be allowed to remain at least twenty-four hours before varnishing.

For a dwelling house, the most satisfactory finish, over the paste filler, for a hardwood floor, is, to give two thin coats of shellac, followed by prepared floor wax, brought to a polish by means of a weighted brush. This can always be kept in good condition by re-polishing, using a little additional wax when necessary. If the wax surface becomes dirty, it can be removed down to the shellac by means of turpentine, and a new wax surface can then be given. Avoid using too much wax.

**Something About Stains**

A California subscriber, G. S. Smith, of Berkeley, wants to prepare a stain for Oregon pine, which he wishes to make from color ground in japan and linseed oil, saying that the prepared stains he buys set up so quick he cannot wipe off the surplus. He wishes a stain that will enable him to bring out the beauty of the grain by wiping it off from the hard parts. He would find that a stain made as he suggests would have the same property of quick setting. Instead of using color ground in japan, he would get better results by using color in oil, thinned with equal portions boiled linseed oil, best brown japan and turpentine. Apply the stain, then wipe to bring out the grain, and after allowing it to become thoroughly dry, finish with two coats of shellac or of varnish as desired.

Colors ground in japan are used in the preparation of varnish stains, employed by amateurs for staining and varnishing in one operation, but these stains are not ordinarily used to any extent by practical painters.

**Painting a Bungalow**

The owner of a bungalow at Convent, La., wants to paint it brown with white trim, and desires to know how to do this so as to get the best effect. As a rule, the object of present-day color treatments is to give breadth of color, and to avoid accenting minor details by picking them out in contrasting colors. The safe rule to follow in case of a house of this kind, would be to paint everything that might properly be termed the body in brown. For example, if siding is used as a covering, then all the siding should be brown and everything else white. Or, if the sides are shingled, the same rule would apply, the shingles being painted or stained brown, and everything else white, including corner boards, cornices, balconies, porches with their accompanying railings, lattices, etc.; window frames and sash; front and other outside doors, dormers and everything that cannot be considered the structural body of the building. Outside blinds, in such a color treatment might be painted like the body or like the trim, but a preferable treatment would be to use either a bronze green or a bottle green. The same color might be used for the sash, but the writer considers it preferable to follow the trim color. For the roof, the shingles would look very well if stained a moss green.

**A Safe Guess**

Ellerton—I would like to know where all the bright girls of the past are.

Broron—I should say that some of them are administering cautious doses of paregoric to the bright girls of the future.
Practical Articles Wanted
To the Editor: Toronto, Ont.
Being a reader of your valued paper since its first year, I would like to see some practical articles illustrated on church or theater construction; what I want is the best method of constructing the balconies, how to finish, etc.
I would like to see both wood and steel construction, as we are about to attempt something in that line, and I would like to see something in your paper on the subject.
I might say that I have learned a great deal out of your paper, and have confidence in it, seeing that I am a paid-up subscriber till September, 1910.
J. J. HELTIN.

A Good Drawing Table
To the Editor: Lisbon, N. D.
As an answer to query of Mr. Joseph F. Kucera, of Prague, Neb., in the April, 1909, issue of the AMERICAN CARPENTER AND BUILDER, how to make a drawing table, I inclose herewith a sketch of one that I made for myself some eight or ten years ago. I have used it a good deal and believe it is as good today as it was when new; and I have not seen any other cheap make that I thought was any better.
The two legs are mortised and glued together and they in turn are held together with crosspieces which are mortised through the legs and held in place with wedges. This makes it strong and steady. The table is made of 1 1/4-inch soft pine, glued together of 2-inch strips, the grain being reversed. The two ends are ploughed out and a hardwood piece glued in to make a smooth edge for the T-square. The bottom of table has 1/4-inch creases ploughed in it to prevent warping. The hardwood cleats under table are put on with three screws each, for each end of the cleats; roundheaded screws and slotted washers are used to prevent splitting when the table shrinks. The hardwood brackets attaching the legs to the table are fastened to the cleats with wood screws. The brackets attaching the adjustable braces to the table are made of 1 1/4-inch material and ploughed out in the center for the brace to fit in and a pin put through for the brace to hinge on. Outside of the top the whole thing is made of hardwood, and is strong. The top can be tilted to any angle desired, or it could be folded together when not in use.
This is free if it is worth picking up, but if it is not worth picking up it wouldn't cost anything anyway.
M. H. SEVERSON.

Length and Cuts of Rafters for Square Roof
To the Editor: Sharpburg, Iowa.
I would like to have some one give a rule for cutting, also for finding the length of a main common rafter on a square roof. Say the rafters are cut on 12 and 10. What would be the length of the common and hip rafters? M. E. BROWN.
The seat and plumb cuts would be on 12 and 10, of course. The 12 side giving the seat and 10 the plumb cut. For the seat cut of hip or valley substitute 17 for 12, because that is the length of the diagonal of 12 and 12, and proceed as for the common rafter.
As for finding the lengths, place the square at 12 and 10 on the rafter and run it as many times as there are feet in the run, and the length will be obtained for the common rafter.
rafter. If there happens to be a fraction in the run the extra length will take care of itself by measuring square out from a plumb line of the last placing of the square. Proceed in like manner for the hip or valley, using 17 and 12 on the square, and run as many times as for the common rafter.

To find the fractional length to correspond with that of the common rafter, measure square out the diagonal amount of the fraction and the corresponding length for the hip or valley will be obtained.

By referring to page 427 of the January issue of this magazine, you will find an illustrated article fully covering this subject, applying to any pitch, as the principle applies to all alike.

The great trouble with would-be learners is that they do not study or master the principle involved, so as to be able to apply it when the occasion demands a change in the size or pitch of the roof. A. W. Woos.

The Pyramid Problem

To the Editor:

Mr. Editor, what constitutes a "sticker"? Should the hexagonal pyramid class as such? But here is the way we used to do it on the Minnesota prairies. If diameters be drawn, as B F, the base of the pyramid is divided into six equilateral triangles, 6 feet on a side. Draw D C and D A perpendicular to B E, then:

C D = C B - B D = 6 - 3 = 3
A C = A D = 14 - 2 = 12
Area A B E = 6 x 13.07 = 78.42 square feet
Lateral area of pyramid = 6 x 39.21 = 235.26 square feet, answer.

Here is another; pass it along:

How many cylindrical cans 1 foot in diameter and 2 feet in depth can be stored in a room 12 feet square and 8 feet high?

FRANKLIN H. BASSETT.

Other Solutions

Peter C. Boddorff, of Miconisco, Pa., by a similar process, finds the required area to be 235.368 square feet.

C. R. Snedeker, of Lodi, Ohio, agrees that it is 235.368 square feet.

Don McPherson, because of a wrong slant height, makes it 222.642 square feet.

Clarence C. Bennett, Santa Paula, Cal., also makes a mistake in regard to the slant height. His answer is 241.49 square feet.

J. R. Montague, Niagara Falls, Ont., writes that he knows no way to get the half-base except by measuring to scale. Using this method he makes the answer 235.36 square feet. G. Jenkins, Ilion, N. Y., finds the area to be 236.25 square feet.

Harry A. Lovett, Harrington, Me., says 235.44 square feet. Reed H. Deming, New Milford, Ohio, makes it 235.368 square feet.

The "Cow" Problem Again

To the Editor:

Here is a solution to Mr. Lifingwell's real "sticker." The problem is not difficult if you apply higher mathematics, and I am much in favor of their use. I will not agree, however, to solve all the "stickers."

(Editor's Note: A very carefully worked out solution follows, trigonometry being used. The answer is 30,204.2 square feet, which—from the number who have agreed upon it—seems to be correct.)

This problem has very little interest in it for the carpenter unless he is able to own a cow and a small plat of ground and he does not wish his cow to be troublesome to his neighbor. I own neither, but somehow I like to solve some of these stickers.

I would like also to state that too much is expected of school teachers, as by far the majority of them are never required to do anything in the higher mathematics.

I know one who, when required to find the number of yards of plastering in a room, completely filled the room with plaster and then maintained she was correct. But she was an exception to the rule. Let's be patient with them and not require too much.

J. W. TRAFZER

A "Quantitative" Method

To the Editor:

It is assumed that the rope is so tied to the cow that she can graze just 100 feet from the corner of the barn; otherwise, the problem cannot be solved without more data.

(Note: A complete solution follows along approved mathematical lines, the amount of grazing ground for the cow being found to be 30,204.275 square feet. Another very unique solution accompanied this first; it is given in full below.)

On a sheet of paper of uniform thickness and weight (ledger bond in this case) I draw the square A B C D with sides equal 1 inch, and produce A B and A D, making A E and A F each 4 inches. Draw the circle E F O with center A and radius A E, equal 4 inches. Then with centers B and
D and radius B F and D E, equal 3 inches, draw the arcs E G, F G. I then cut out the circle carefully and weigh it upon a balance which will weigh 1/20 milligram. Then cut out the square A B C D and the part enclosed by the quarter circumference E F and the two arcs. The remaining figure represents the ground grazed over by the cow. Of course, in this drawing, 1 inch represented 25 feet.

The respective weights of the circle and figure grazed over were 3.853 and 3.716 grams.

The area of the circle, as in first solution is 31.416 square feet. Then,

\[
\text{Weight of circle} : \text{weight of figure grazed over} :: \text{area of circle} : \text{area of figure}; \text{or}, \frac{3.853}{3.716} :: \frac{31.416}{31.416} : \text{answer}.
\]

Solving the proportion we get 30.294.348 square feet, which is remarkably close to the result of the first method.

In this method there must be extreme accuracy in drawing and cutting the pattern, and careful weighing on an accurate balance.

R. H. HARPER.

By Simple Mathematics

To the Editor: Rockville, Conn.

Anent your problem of the cow and the grazing lot, here is a solution based on principles of measurements found in the text-books of the common schools, except two, viz.: that of finding the length of the arc of a sector and that of finding the area of a sector: the rules for these I found in a very old text-book on mensuration, as follows:

First. From 8 times the chord of half the arc subtract the chord of the whole arc; one-third of the remainder will be the length of the arc.

Second. To find the arc of a sector. Multiply one-half the length of the arc by the radius of the circle; the product will be the area.

Working the problem by these rules I find: Three-fourths of the circle equals 23.562; area of two sectors equals 57.58.85; two triangles between the sectors equal 975.95; total area over which the cow can graze equals 30.296.235.

W. J. TEMPLETON.

Others

H. W. Stevers, of Roseland, La., finds that the cow can get at 29.265.2 square feet of pasture.


Harry A. Lovett, Harrington, Me., points out two mistakes in Mr. Collier's solution as published last month. With these corrections made he says the answer will come out 30.294.3 square feet.

Franklin H. Basset, Edmonds, Wash., finds the same errors in Mr. Collier's solution and makes the result 30.291.6.

W. N. Collier, Santa Rosa, Cal., submits another elaborate solution correcting that of last month. He carries decimals to five and six places, and finds 30.491.02 square feet for the answer.

Jac. Gerend, Milwaukee, Wis., says 30.428.5 square feet.

J. R. Montague, of Niagara Falls, Ont., writes that he takes much interest in working the problems. His verdict concerning the cow and her feed is 29.256.7 square feet.

Problem for Timbermen

To the Editor: Harrington, Mo.

I am sending a "sticker," which is this: On the water's edge of a stream 50 feet wide there is a tree 100 feet high. How high up will the tree break and bend over (not falling off stump) so that its top just reaches the opposite bank?

HARRY A. LOVETT.

A Warlike "Sticker"

To the Editor: Fountain, Col.

I am an old subscriber to the AMERICAN CARPENTER AND BUILDER, and will say it is the most helpful journal there is for the carpenter and mechanic.

The sticker column is all right—keep them coming brothers! We all like to crack nuts. Here is one that is not very hard to crack, but has caused many an undecided argument:

A cannon is able to throw a ball 60 miles a minute; at the same time or second the cannon is discharged it is drawn backwards 60 miles a minute. How far from the cannon will the ball be after 1 hour's time, and how far will each be from where the cannon was discharged?

Let us have your idea on the subject.

L. E. BRUNDAGE

Board Trimming Problem

To the Editor: Milwaukee, Wis.

Here is another "sticker": A carpenter had a square piece of board from which he cut off 1-inch all around. He measured the board again and found out that he had cut off as many square inches as he had left. How many square inches did he cut off?

JAC. GOREND.

How to Join Members of Cornice

To the Editor: Smithland, Ky.

Would you kindly tell me with illustrations in your paper the proper method of constructing and connecting cornice on a frame house where the end and side of the house are on a line.

J. A. THOMPSON.

Answer: It is presumed that the question has reference to a house with a side gable where it is desired to have the fascia mold member with a like mold of the raking cornice of the main roof. If so, we will say that it cannot be done, because the mold on the fascia of the gable is resting on a plumb backing while that on the raking cornice is at right angles to the pitch of the roof. Consequently, they cannot directly member without making a return connecting the two. This can be very small, just enough to fill the inverted V-shape gap, where the top edge of the two are on a line, or it may be gotten over by letting the gable extend a few inches so as to purposely make the return longer and thereby destroy what otherwise may seem to be a blunder on the part of the workmen. The accompanying elevation and plan we trust will illustrate the point in question.

However, there is another point in connection with a roof of this kind that we wish to call attention to, and that is the cut on the plancher of the gable to member with that of the raking cornice. We have seen carpenters who could readily frame a hip and valley roof, but when they came to make the above cuts, were puzzled to know how to apply the square.

The trouble is in this, as in most all other framing prob-
items, they did not stop to think. We make haste sometimes by going slow, and this is one of the times.

Now, let us stop and think. To begin with, the plancher of the gable lies in exactly the same position as the jack rafter. Consequently, the figures that give the plumb and side cut of the jack will give the cuts for the plancher, but are reversed; that is, the plumb cut becomes the edge cut and the side cut becomes the face cut across the board. As for the cuts of the raking plancher, it lies in exactly the same position as the roof board just above it, consequently the same figures that are used for the roof boards will give the cuts for the plancher.

To the Editor: Cosby, Mo.

I have a house I want to repaint; the paint has about all perished and the house is very dry. I am going to follow your Mr. Edward Hurst Brown's instructions for painting a house in the above named condition; he says, first give it a coat of raw linseed oil, with the proper amount of turpentine and japan driers added. Now what I want to know is, after this is done, how best to apply the following two coats of paint. Should the first coat of paint be well thinned with oil or should it be put on about as furnished? (I intend using a good brand of ready-mixed paint.)

Answer: In painting this house, the first thing is to get the old paint off, as much as possible, either by scraping, if it is scaly, or by using wire brushes. Next give a coat of oil under one better by turning crooked and when possible, they may keep on a day or two after the rain is over. When crooked—and they often are—turn crook up when posts may keep on a day or two after the rain is over.

When crooked—and they often are—turn crook up when posts can be made straight and even, to allow the nailing on of wide corner boards to cover the end wood of logs, which usually crack, take in water and rot.

It does not pay to put siding on a log house; it protects the logs from the weather but makes the building colder, because the plastering loosens and you cannot get at it to plaster again; and so it is only the siding to keep out the cold, except what is on the inside of the logs; this you can get at until you wainscot or plaster it on lath. The reason plastering loosens is that a log house never gets through settling—never; so it presses the mortar away from the logs. For keeping out the rain, the round log is best. If logs are hewn, or sawed flat, the rain drives through easily.

Cuts "a. a. a." show how to measure bevel of dovetail cut on a round log. Use a divider and measure at "a. a. a." all same height, at both ends of log, so as to get the drop the same at each end. It is well to use butt and small ends of logs alternately, unless very even of thickness at both ends. When crooked—and they often are—turn crook up when possible, unless log should fit the under one better by turning crook down. If too crooked, it can be straightened somewhat by sawing up into log, which will let it down some. Do not turn bends of logs out and in. It makes a crooked wall and is much more liable to spring out of shape. Some use logs in the gable, whether roof is to be shingled or not; others use the dovetail cut is mostly used for dwellings, as it has a tendency to hold corners together better than the straight cut, and then the corners may be made straight and even, to allow the nailing on of wide corner boards to cover the end wood of logs, which usually crack, take in water and rot.

Two men usually are needed, one at each end of log, to do the fitting. Sometimes the logs are let down so as to ride on some knot, or hump. They should not do this; cut off projections.

Barn log style is best for outbuildings; it is easier to fit, and sheds water better than the other kind. Short ends are left outside of cuts, to hold logs together. If made very long, they are very handy to run against.

How to Build a Log House

To the Editor: Fossum, Minn.

In certain localities, it is necessary to erect barns and out-houses, and even temporary dwellings of logs, and there are several ways to proceed.

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How to Build a Lumber Shed

To the Editor: Convent, La.

I send you herewith drawings for lumber shed requested by you for the benefit of Mr. Baysore or others interested. From the cross sections you will see its make-up. I built this style for the J. C. Rives Cypress Lumber Company; its arrangement on the front is similar to the shelving in a store.

The stalls are partitioned off to suit the stock. This shed can be built 100 to 200 feet long, depending upon the amount of stock you intend to keep on hand. Each pocket should be tagged A 1 x 2 x 12, B 1 x 8 x 16, C, etc. Also molding department as No. 8066—14 feet lengths, 10, 12, etc.

An important feature of this shed you can see is the drive-way giving access to your entire stock. B. P. TurEAvD.

Stucco Work Over Old Brick

To the Editor: Upland, Ind.

Being a charter member of your valuable paper, I take the privilege of asking your advice concerning some stucco work I have to do. I have a 2-story brick building to plaster on the outside with cement. Most of the bricks are very soft and badly eaten out, but the mortar joints are in good shape. Can this be done with any certainty of standing? If so, will you please give me the specification for such work and the great care must be used if it is to be a satisfactory, permanent job. The fact that the surface of the brick is badly eaten will do no harm; in fact, it ought to be to your advantage in doing a good job, for the rougher the surface the tighter the plastering will adhere to it. All the mortar joints should be cut out, using a granite point or a regular hand drill hammer, the cutting to be from 1/4 to 3/8 inch in depth. After this is done the wall should be thoroughly cleaned, using a coarse fiber brush and water. If the wall has been painted, as much of the paint should be removed as possible. The wall is then ready for the plaster.

First apply a thin "scratch" coat. This is made up just the same as for ordinary interior plastering, except that a little Portland cement should be added and the quantity of hair used should be reduced about one-half. Score or scratch the surface of this coat when it is partly dry.

Next apply the "browning" coat. This contains more of the cement and less of the hair mortar. This coat should be applied carefully, laid on with even thickness, all corners and returns being shaped up square and true. When this coat is set enough so that it cannot be indented with the finger the finishing coat should be applied. This may be sand finish, pebble dash, slap dash, etc., just as desired; and its application is just the same as for any kind of outside plaster work.

The total thickness of the three coats should be about 1 inch.

The cost for plastering over old brick walls is usually figured at from $1.25 to $1.75 per square yard. This would include the work of erecting scaffolding, cleaning out mortar joints, roughening, the washing of walls, etc. The cost, however, would of course depend on the experience of the men employed and the local cost of materials.

How to Frame Hood Rafters

To the Editor: Barnes, Kan.

As I have had some difficulty in cutting hood arms, I am writing you for information. Take a barn 20 feet wide with 12 and 10 pitch. I wish to build a hood with a 14-foot base and 7-foot projection. Please explain the cuts for these rafters.

C. GULLIAN.

Answer: The hood arms rest in exactly the same position to the common rafter as the hip or valley would in a roof of like pitch. The cuts are the same at both ends. Twelve and 10 will give the plumb cut (cut on the latter) and 12 and 15 will give the cut across the back of the rafter (commonly called side cut—cut on the latter). If it is desired to have the back of the rafter lie in the plane of the roof, it should be backed one way only and the gauge line in this case would be 3/8 inch square down from the edge of a 13/4-inch rafter. If the packing is done before the cuts are made, then 12 and 15 will give the cuts. Cut on the latter. A. W. Woots.
How to Construct Pivot Windows

To the Editor: Trenton, Ohio.

Mr. Albert Gonne, in the March number, had a sketch of a pivot window. I wish to show the readers the way I pivot the sash, which adds greatly to the appearance. The difference is in the sill, which will keep out the storm, and the head will stay in better shape. Nothing is too good for the subscribers of the American Carpenter and Builder, of which I am one.

George C. House.

Fireplace Construction

To the Editor: Fitchburg, Mass.

Will some of your readers give information as to the proper construction of a fireplace? What is the proper proportion of the width to the height; the height to the depth, size of throat, flue, etc.? F. O. Littlefield.

To Lay a Tight Barn Floor

To the Editor: Florence, Mont.

Mr. Hinchin’s suggested way to make a tight barn floor is probably as good as could be devised if wood alone is used; but it is open to the objection that it would be constantly saturated, and would soon rot out.

A better way would be to have a concrete floor; and, if it seems preferable to have wood for the animals to stand on, lay a floor of rough planks, somewhat open, over it. An excellent way is to have the concrete floor with an unbroken surface, sloping enough to drain to the desired points, and to floor the stalls only with plank; leaving cracks wide enough so that all liquid would immediately run through to the concrete.

W. D. Graves.

Wanted—A Band Stand

To the Editor: Reedsburg, Wis.

Will you please insert a cut of a band stand in your valuable paper in the near future, to cost about three hundred dollars.

Byron Randall.
Which Way Is Right?

To the Editor: Stuttgart, Ark.

I would like to ask a question in regard to hanging screen doors. I have had arguments several times over what is the right way to hang them. I claim the wire should be on the inside, so if there are any flies in the room they are more easily chased out, and have no chance to stay in the corners of the stiles, projecting the thickness of the door; and I also think a fancy screen door looks better from the street, hung that way. Let me have the verdict of the readers of the AMERICAN CARPENTER AND BUILDER as to which way is right.

P. J. BUERCKLE.

A Heavy Timber Barn

To the Editor: Granville, Iowa.

I herewith send the renewal for my subscription. I regret that I am a few days late and hope that I won’t miss the April number. I would not like to miss a single one. It is the best building paper ever published. I herewith send you a photo of a heavy frame barn. The building is 40 by 54 feet with 20-foot posts, all mortised and pinned. The posts are 8 by 8 inches, and there is no stick lighter than 4 by 6.

On each corner is a brace mortised in the sill and plate, 6 by 8, and girders mortised in same. This is the only way to brace buildings for these western high winds. The roof is a gambrel, the lower rafter having two-third pitch and the upper ones one-third pitch.

B. J. Diers.

To Put Screen Wire on a Door

To the Editor: Detroit, Mich.

In making the frame of a screen door it is well to regulate the size of the vertical styles so that they will call for some one of the standard widths of wire cloth, and thus avoid cutting off a selvage and leaving an inferior edge.

Lay the frame on a pair of trestles with a loose board or two resting on the same short enough to drop inside to relieve the sag in the middle of the cloth. Space the cloth by putting a temporary tack in each corner. In the middle of either end put two adjacent permanent tacks. Go to the opposite end, stretch as tight as possible and put in two more. Repeat the same for the sides. Next take out the four corner tacks. When the corners are free you can get a good hold to stretch it, both from the last tack and from the opposite side. Put in but a few tacks until you go to the opposite side, and carry it on evenly until you get within about half a yard of the corner. Then alternate between the style and the head until you finish at the corner. It is a job which keeps getting easier all of the while.

The upholsterers do nearly all their covering on this principle. I got the idea from them, and pass it on, hoping it may be of use to some amateur who sometimes has such jobs at his home.

LESLIE EDMISTON.

Concrete Walls and Beams

To the Editor: Smith Center, Kan.

Will you give me information in regard to construction of concrete walls where seven or eight storerooms are to be built side by side; wall to be 14 feet high. Can these walls be constructed in such a way as not to sweat? Is there any way by which I can construct a truss to carry a cement roof over these rooms running from 20 feet to 28 feet wide?

R. H. Tracy.

Answer: Concrete will pass a sweating period, but blocks made and left out in the weather are usually safe to use with no danger of sweating. However, if coated with a good water-proofing paint before plastering, any kind or age of blocks can be used with safety.

A safe beam to carry roof would be 12 inches wide and 1 inch deep for every foot of span, viz.: for 20-foot span make beam 20 inches deep, and for 28-foot span make it 28 inches deep. These beams should be reinforced with 4 rods 1/2-inch diameter 2 inches from bottom and 2 rods 3/4-inch diameter 2 inches below top, and looped every 4 feet with 1/2 by 1/2 inch flat iron bands for the 20-foot beam. Use 6 of the rods in bottom and have loops every 3 feet for the 28-foot span.

This is a rough estimate. If exact load and construction were given there might be a saving of material over these sizes.

FRED W. HAGLOCH.

A Sand Anchor

To the Editor: Cape May Point, N. J.

This very useful contrivance first came to my knowledge...
when a contractor who had undertaken to move a very heavily timbered building, about 25 by 50 feet, 2 stories high, gave it up. He had the tackle and all necessary appliances, but was handicapped for a suitable place to take hold. He rigged up a series of backing, as shown in outline below, but to no purpose, for the stumps were snatched out, as easily as a man will pull up a cornstalk.

When the sand anchor was suggested, it took but about fifteen minutes to rig it up, whereas the other arrangement had taken at least an hour, showing that in the saving of time the anchor will recommend itself.

Two oak or yellow pine boards, 12 by 1 1/4 inches thick, and 3 feet 6 inches to 4 feet in length, were secured together, loosely, by means of a 1-inch eyebolt and key. On both sides of each board were screwed a 1/4 or 3/16 inch thick plate, about 4 inches square; a hole being bored through them, and the boards, for the eyebolt, which had a loose fit. A pennate, consisting of a doubled 3/4-inch rope, 2 yards in length when doubled, was furnished with a cringle or eye at each end, and a hook to connect with the eyebolt. The ropes were secured to each other at the cringles, and at two points between, as indicated in sketch. The hook also was kept from slipping out of the eyebolt by wrapping cord around the end after the rope was in place.

A hole, 3 feet deep, was dug in the shape of a cross, and the anchor dropped in. The earth was thrown into the hole loosely, no attempt being made to pack it. This size anchor was used in moving a very heavily constructed building, which was use for a life-saving station at one time. For lighter or heavier work anchors in proportion can be constructed, using wire rope instead of hemp, should the work in hand be extra heavy.

The Use of the Steel Square

To the Editor: Hartman, Col.

In the January number, page 427, a question is asked: "How to find the cuts of rafters." There it says, concerning the jacks set 16 inches at centers, "Slide square along from 12 to 16 and the length of rafter covered tells common difference."

Will same rule work on any pitch? Say for 16 inches, 18 inches, or two feet?

To give side cut you take 12 on the tongue and 13 1/4 on the blade for the jack. What are the figures for the side cut of the hip or valley? Would 17 on the tongue and 18 on the blade give it? Please give a rule for side cut of hip and valley.

J. M. Riniodoll.

Answer: The questions asked have reference to an illustrated article in which the 1/4-pitch was taken as an example, and is as clear as we know how to put it. The rules stated and the principles explained are perfectly general, and can be easily applied, and with good success to any other pitch. And this is the beauty of steel square framing—once you have caught the scheme of it all framing problems can be solved; the rules are perfectly general.

We are glad to answer these simple questions over and over again; but that will do little good unless the readers stop and think and study.

What Is the Trouble?

To the Editor: Lanesville, Mass.

I put a bay window on a house, and after a while it commenced to leak. I took off the saddle board and fixed it the best I could, and still it leaked. There was a window over the middle of the piece, singles come up to the sill; I ran the zinc up in the groove on sill and all along under the clapboards.

If some of the readers would be kind enough to give their version of the trouble in the AMERICAN CARPENTER AND BUILDER, as I know others have had the same trouble, it would oblige me and all readers.

Albion Knowlton.

To Lay Out a Gas Light Dome

To the Editor: Detroit, Mich.

I would be pleased if you would give me the dimensions of a good-sized hexagon or octagon dome for a dining-room gas light. I am a charter member of the AMERICAN CARPENTER AND BUILDER and consider it the best building paper I ever had.

Walter H. Dennis.

Answer: It depends somewhat upon the construction of the dome as to what dimension would be most appropriate.

A dome in which the diameter of the opening at the top is 5 inches, with 24 inches at the base, is a good size. We show in the sketch the method of developing the sides of the hexagonal dome. The circles were stepped off into eight parts, two of them being removed. Enlarging or lessening the circles or the number of parts will change the size and slope of the dome. An octagonal dome would be made by stepping the circle off into ten parts and removing two.

Ira S. Griffith.
The T. F. Deck Gravity Level

Here it is! Another candidate for popular favor in the way of a gravity level for the use of building mechanics is that which has been brought out by The T. F. Deck Gravity Level Company, of Toledo, Ohio. This level has met with such unprecedented favor with the mechanics throughout the United States that it will be necessary for the Deck Gravity Level Company to multiply its manufacturing capacity many times over that of the preceding year.

This level is the result of many years of patient, persistent effort by the inventor, Mr. Deck, to perfect a gravity level. His level will record upon a surface dial, positively, absolutely and accurately to the most minute fraction of an inch, the amount of which anything is out of plumb or level, and is the only invention of its kind in the world.

The arrangement of parts in this level is such as to make the level automatically indicate horizontal and vertical positions, and the angle of any deviation correctly, without any adjusting whatsoever.

It is simple in construction, and as the name implies, is operated by the laws of gravitation, as exemplified in a plumb-bob. This plumb-bob, or pendulum, is suspended from a shaft or arbor which rotates in three-disk roller bearings, journaled in a brass barrel. This arrangement of the pendulum, arbor and disk roller bearings produces, it is claimed, 75 per cent more power than is lost by friction. What is understood by this is, if one end of a level stock is raised one-sixteenth of an inch to the foot, the indicator will instantly move one-sixteenth of an inch on the graduated dial, which is graduated the same as a rule or square.

Fastened on the shaft, or arbor, is a multiple gear-wheel of brass in which are cut one hundred and fifty teeth, so accurately spaced as not to vary one-half thousandth of an inch. The teeth of this multiple gear-wheel mesh in a pinion, and to one end of this pinion staff is attached an indicator, which points to the graduations on the dial, showing whether the work is level or plumb. A brake is also provided which operates upon the shaft in such a manner that by pressing on the lock button, which is on top of the level stock, will at once stop the pinion staff to which the indicator is attached;
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THE quality, the price, the ease with which it can be laid, the fact that it requires no painting, its adaptability for any climate, have made Amatite “The Great American Ready Roofing.”

We have never stood still under any belief that Amatite was as good as it could be made—or “good enough.” Our aim has always been perfection, and while working towards that goal we have striven to make Amatite leader over all kinds of ready roofings.

Nothing short of that has ever satisfied us.

No qualities which have brought such phenomenal success to Amatite are the qualities which are peculiar to Amatite alone, and these are no secret.

That which makes Amatite the best wearing and most water-proof roofing is the liberal use of that time-tested and absolutely supreme waterproofing material—Coal Tar Pitch.

Nothing has been discovered or made that equals it for keeping out the water.

With two layers of coal tar pitch as the foundation, interlaid between layers of wool felt, we add a top finish of real mineral matter—a combination for a ready roofing that cannot be excelled.

These may seem extravagant statements, but we “stand by the goods” and behind them, and an easy way to settle all doubt in your mind is to write for a sample and test it yourself.

Ask for Catalog No. 2 and Price List B.

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Let us supply full information concerning our complete “SYSTEM” of Construction.

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also by pressing the lock button, and giving the button a quarter turn it will lock the movement when not in use.

The point is made so that the movement of this gravity level is fitted into the stock, and securely fastened, so there is no chance of the instrument getting out of adjustment.

By writing the T. F. Deck Gravity Level Company, Toledo, Ohio, and mentioning the American Carpenter and Builder, they will be pleased to send you a circular fully describing this practical instrument.

Hamilton Universal No. 103

This machine, with or without boring table, is especially designed for a great variety of operations, such as jointing,

smoothing, planing out of wind, squaring, beveling, tapering, rabbeting, gaining, plowing, cornering, beading, mitering, tenoning, panel raising, hand matching, molding, rip and crosscut sawing; boring, etc.

Though not classified among the "Universal woodworkers" in the past, it has nevertheless been considered such by many on account of the great variety of work it is capable of doing.

It is a machine especially designed to meet the wants of those who have a variety of work to do, who cannot put in machines for each purpose, and who want a good combined machine at small cost.

It is quickly arranged without material change for rip and crosscut sawing, planing, matching, jointing, panel raising, tenoning and boring, and a variety of other operations conveniently performed.

The table is of iron, 5 feet long by 3 feet wide, and is adjustable for height, being raised and lowered in sleeves by means of the one hand wheel shown, on the cylindrical slides provided, one at each end.

Two separate adjustable tables are placed in this large top which are adjustable to and from the center for either planing or sawing. The full length groove near the edge of the table receives the guide bar of the adjustable cross-cutting and gaining frame furnished with the machine, as shown on

facturers of the well-known "Hamilton line" of woodworking machinery.

Are You Getting What You Pay For?

This is the question asked in the little folder of the Badger Steel Roofing and Corrugating Company, 214-216 Second street, La Crosse, Wis., and asked relative to the purchase of galvanized corrugated standing seam, roll cap and other formed roofing materials. That is, when ordering, for instance, No. 29, are you getting No. 29? Some manufacturers admit that they substitute No. 28 for it, and when No. 28 is ordered, No. 27 is given.

The little folder that asks this question has some information in it that will help every buyer of galvanized metal, as it gives the United States weights, and this will be gladly sent to anyone who wishes it.

This company are now occupying their new quarters, which are admittedly the largest in the northwest. Their substantial growth, from a small concern, organized in 1903, to their present size, is due solely to the fact that they have
GREATEST BUILDING MATERIAL OFFER EVER PUBLISHED

$410.00 BUYS ALL THE MATERIAL IN THIS BARN

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A modern, up-to-date barn, one of many illustrated and fully described in our free "Book of Plans". This barn can be readily constructed by an ordinary mechanic with the aid of our simple plans, specifications, furnished free of charge. In referring to this design mention "J-11".

100,000,000 FEET OF BRAND NEW High-Grade LUMBER at WRECKING PRICES!

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

As to quality, rest assured better lumber is not manufactured. Don't think about what unscrupulous dealers may tell you. Our material is guaranteed to be clean, new, fresh lumber—not wrecked material in any sense of the word—but just as good as you can buy anywhere and it is sold under a positive, binding guarantee which protects you, absolutely. We don't ask for money in advance. You can buy without paying one cent of money with your order. All we require is a guarantee as to your responsibility. Money refunded if material is contrary to our guarantee. We have a capital stock and surplus of over $1,000,000. We refer you to any bank or banker anywhere. Or you can write direct to the Great Stock Yards Bank, The Drovers Deposit National Bank of Chicago. We say that, quality considered, we can supply you with the finest, most up-to-date material. Write for our "Book of Plans," which gives details showing exactly what material is furnished. Mention design "J-11". This is only one of many other designs in the book. If you have any further plans of building material, the time to act is to-day. Write for our Furniture and House Rock Plans, which shows from life as well as floor plans; it explains our plans and fittings; with bill of material for $2.00. Our special furniture catalog will save you money on furniture, carpets and rugs.

SEND US YOUR LUMBER BILL FOR OUR ESTIMATE!

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

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Don't put it off 'til later — send us the coupon right now. It will only cost you a minute's time and a two-cent stamp. We have got to do a whole lot more than that. It costs us a lot of money to send out these samples. We couldn't afford to be so liberal if it were not for the fact that a man cannot test Johnson's Wood Finishing specialties without being convinced of their superiority.

We want to send you at once this package of samples, including a bottle of Johnson's Wood Dye (any one of the 14 shades you want), a sample of Johnson's Prepared Wax Black and a sample of our Under-Lac (better than shellac or varnish) for a high-glossed finish.

We want to send you a sample of our Black Wax, for it is the only wax on the market suitable for use over dark finishes. All other brands will show light in the grain or corners where it is sometimes carelessly left. You will be very much surprised at the results obtained with our Wood Dye and Prepared Wax Black. With Johnson's Wood Dye inexpensive woods may be made as beautiful as hardwood.

We recommend the use of a coat of Johnson's Under-Lac over our Wood Dye upon pine, cypress and everywhere else that a higher gloss than a waxed finish is desired. A single coat of this Under-Lac is better than the best shellac or varnish. Johnson's Prepared Wax can be successfully used upon furniture and woodwork as well as floors. It produces a lasting artistic finish to which dust and dirt will not adhere.

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“W”e will also send you our illustrated guide book for home-beautifying. Contains complete color card and complete directions for finishing and refinishing wood.

It is full of practical information and helpful suggestions that are of great value to painters and wood-finishers.

Johnson’s Wood Dye is made in fourteen beautiful colors. From these any desired shade can be made. To lighten use alcohol—to darken use Flemish Oak No. 172. Pick out any color you want from the list below, and write the number on the coupon. If you would like a set of wood panels, showing various shades of Johnson’s Wood Dye, kindly note this on the coupon, and we shall be glad to include them with the working samples. These panels will be mighty handy for you to show your customers. Help them to pick out just the colors they want. And you can depend on it, Johnson’s Wood Dye will always match up exactly with the samples.

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No. 170 Hog Oak  No. 122 Forest Green
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No. 129 Dark Mahogany  No. 178 Brown Flemish Oak

Fill out the coupon and let us send you sample bottle of Johnson’s Wood Dye, one bottle of Johnson’s Under-lac and a sample of Johnson’s Prepared Wax Black.

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gotten their business and held it, by giving the best obtainable at a reasonable profit. They have tried—and succeeded—to do everything thoroughly, and with this end in view have

sought only the best sources of supply, and have, consequently, been in a position to secure the best results.

Owing to their ideal shipping facilities, orders can be filled quickly and with less expense, and you, Mr. Builder, reap the benefit.

The Badger Steel Roofing & Corrugating Company would be pleased to furnish estimates. If they can save you money it's to your interest to investigate. Their's is the complete line: Cornices, skylights, finials, ventilators, metal ceilings, slate, tile and tin roofing, architectural sheet metal work, eaves trough, conductor pipe, wire and steel hangers, sheet metal roofing and siding, steel and wood tanks. Drop them a card for their folder.

New Simplex Mixer

The Miles Manufacturing Company, of Jackson, Mich., whose concrete block and brick machines have been so well and favorably known to all concrete workers, are exhibiting and demonstrating this year at the cement shows their newly acquired machine, the New Simplex concrete mixer.

Experimenters have been trying for many years to get a thoroughly reliable continuous mixer. The reason for this is that the contractor who operates with a regular force of men can work to much better advantage with a continuous mixer, thereby reducing labor costs. This is evident from the fact that batch mixers are now being made as nearly continuous as it is possible to get them. The greatest objection registered so far regarding continuous mixers is their unreliability both as to feed and the mix.

The aim in designing the "Simplex" was to get an absolutely positive and reliable continuous mixer. Pocket feeds, etc., have been eliminated, and the feed has been made continuous. This is accomplished absolutely, as the same amount of material is running into the conveying drum at all times except as the proportions may be varied. Owing to the large drum revolving, the material is carried around in it and mixed the same as with the batch process.

Star Expansion Bolt Company Moves

The Star Expansion Bolt Company, of Bayonne, N. J., whose standard line of expansion bolts, toggle bolts, cable hangers, drills and drill holders are so well and favorably known to the trade, have removed their general offices from Bayonne to 147 Cedar street, New York City, where a very complete stock will be maintained at all times, and where the company hopes to have the pleasure of receiving their friends who may be either located permanently in the city or just there to see the sights.

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

CARPENTERS AND BUILDERS

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

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If it should fail during that period you get a new roof absolutely free.

Of course Congo will last the full time and more.

Otherwise the Surety Co. couldn't afford to stand behind it.

The real insurance lies in its durable, lasting qualities. Nevertheless, to give the purchaser confidence, we furnish him absolute protection against loss by including the numbered and recorded Surety Bond with every roll.

No other ready roofing manufacturer dares give such a guarantee.

A Surety Bond like this is as good as gold, and Congo to be sold profitably this way must be "as good as its bond"—and you can be sure that it is.

Send for sample of Congo today. You can then see why we are so willing to guarantee it.

UNITED ROOFING & MANUFACTURING CO.
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Expensive Experiences

A Plain Talk to All Interested in Concrete Building Blocks

The enormous future for concrete building blocks has naturally induced many ambitious and progressive men to open plants for the manufacture of this great building material.

Many, not being thoroughly familiar with the different types of machines built, have been induced, through misrepresentation or otherwise, to install machines whose very construction alone would prevent the manufacturer's claims ever being fulfilled. The result has been that many have become discouraged. Others have either been compelled to purchase machines built along correct lines, or be driven out of the business by competition. This is a sad and expensive experience.

Many have made the mistake of buying a machine simply because it was cheap, not realizing that such machines were the most expensive in the end, the blocks produced—being of an inferior grade, always out of square, lacking in design, with no variety—would not sell. Therefore, in order to stay in the business, an entirely new machine, built along correct lines, became necessary.

Many have bought machines, being led to believe that they could produce any size of building block, finding when the machine arrived that only one length could be made, and in order to make another length it was necessary to buy a second machine, and even then, they could not supply the demand for regular standard sizes. They realized, too late, the impossibility of making a 20-inch or a 24-inch stone on a 16-inch machine, a 32-inch stone on a 24-inch machine, or a standard-size window sill on a 32-inch or smaller machine. This expensive experience of buying several machine to do the work that one machine built along correct lines should do, could easily have been saved.

To produce concrete blocks, a coarse aggregate must be used, mixed wet. This is an impossibility with machines whose cores are removed from the side, as blocks will collapse after removing core. Such machines are not built along correct lines. They produce blocks made of dampened sand and cement, which break and crumble. Such blocks are a detriment to the industry and naturally injure the reputation of anyone producing them.

Another handicap has been the lack of variety in designs. On account of the enormous expense connected with producing a great variety of designs with each size, many of the smaller manufacturers are prevented from furnishing more than one design with each size, resulting in that awful "sameness of appearance," so objectionable to all builders.

When buying a machine, the future should be considered, as well as the present. As your business succeeds and grows, you will find it necessary to add to your equipment new sizes, designs, etc. You cannot do this unless the manufacturer of your machine is still in business.

Therefore, when you buy, profit by the experiences of others, and get a machine built along correct lines; a machine that will make a concrete block; a machine that will make all heights, widths, lengths and designs; a machine that expands as your business grows; a face-down machine with cores that remove from the top; a machine built by an old reliable firm.

(See next page.)
99 TIMES OUT OF 100
SUCCESS IN THE BLOCK BUSINESS IS ASSURED

If you use HERCULES MACHINES, making real CONCRETE BLOCKS.

This fact is proven conclusively by the steady growth of Hercules plants everywhere; by the duplicate orders received; by letters from enthusiastic users of Hercules machines, who have practically eliminated competition. What's the reason?

HERCULES BLOCK MACHINES enable operators to produce a grade of stone that overcomes competition—strong, durable, everlasting stone of the best quality—the kind that withstands fire.

Look at this Test! — Study it for Yourself!

These walls required no repairing. Were pronounced perfect when everything else was gone. Read what the owners said right after the fire:

"Walls were in fine condition, requiring no repairs for rebuilding." These walls were examined by thousands, many being prospective builders. If you had made these blocks, YOUR sales would have doubled instantly!

After Fire, Nothing Left but Walls of HERCULES Stone.

Cut This Advertisement Out—Show It to Builders!
IT WILL HELP YOU AND THE INDUSTRY IN GENERAL.

BUT REMEMBER: This was Hercules Stone; or, in other words, Real Concrete in the form of building blocks. This kind of stone cannot be made of sand and cement mixed damp. It must be a coarse aggregate, mixed wet. Hercules block machines are the only machines that allow for the use of a really coarse wet mixture. You can't use a wet mixture in a machine that inserts and removes cores from the side; BECAUSE blocks would collapse and fall out of shape the minute cores were removed. You can't use a wet mixture in a machine with impression plate on the side—in other words, "side-face" machines—because the material will stick to the moulds. No matter what other manufacturers may claim, these are facts beyond dispute. Hercules machines are built along correct lines. They are "Face Down" machines, with cores removing from the top. They are unlimited, making all Heights, Widths, Lengths and Designs—impossible with other machines. That's why Hercules operators succeed.

You can make no mistake in buying a tried, proved, known machine, backed by reputation, popularity and a reliable Company.

Send for our Catalogue. It will pay you.

CENTURY CEMENT MACHINE CO.
268-278 St. Paul Street
Rochester, N. Y.

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
A Gasoline Engine Opportunity

Almost every owner of a small shop can use power economically in his work. Many labor-saving machines which cannot be operated by hand can be introduced and thus both the capacity of the shop can be increased and the cost of turning out work largely lessened.

With the development of the gasoline engine practically all the objections to the use of power in shops which would not use machines continuously have been overcome. Naturally, a steam engine, to be used economically, must be run all day, for it takes some time and fuel to start it, and if it was only to be used a few minutes at a time it would be very expensive. Moreover, a steam engine requires a boiler and other apparatus which increase the cost and take considerable space.

The electric motor, of course, is a highly convenient machine, but in many localities there is no current in the daytime, and in most the cost for current is so large that the motor has not come into the general use which its convenience and adaptability would otherwise deserve.

The gasoline engine has none of these objections. It is comparatively small and is entirely complete in itself. It is always ready to start and can be instantly stopped. The cost is less than that of the electrical or steam power plant, and the expense of operating is very slight.

A small shop can be equipped with a gasoline engine for slightly over a hundred dollars. It will run all of the light machinery, such as saws, planers, etc., and will produce a maximum power planers, etc., with a minimum of expense and trouble.

The White Lily engine, advertised in this issue, is particularly adapted to shop work, as it is very small. It is air-cooled, so that there is no danger of its

Great Variety of Designs

Colonial
Corinthian
Craftsman
Mission
Renaissance
Ionic, etc.

KING MANTELS

$5000.00

Worth of Proof

In our magnificent catalog—including the art supplement "Colonial Beauties"—is shown the greatest variety of beautiful and serviceable mantels ever catalogued. Illustrates the graceful outlines—the artistic conceptions that were designed to match every style of furniture made.

Gives reasons why King Mantels have no equal on earth. Explains the points that you have read about. Backs up every claim we make with solid proof.

Although this catalog actually costs us 50 cents to deliver, we will send it absolutely free to any builder who names the probable number of mantels that will be required.

Artistic and Durable

Although King Mantels are superior to anything made for durability and unique appearance, the price is just as low as the other kind.

Of course our large output makes this possible.

Get the catalog before the first edition is exhausted.

King Mantel Company,

551-553 West Jackson Avenue,
KNOXVILLE, TENN.
Sheet Metal Building Material

THAT HAS ALWAYS GIVEN PERFECT SATISFACTION

Fire-Proof Metal Windows, Fire Doors and Shutters, made of Galvanized Steel and Copper.

Write for our special catalogue "A" which fully describes their construction.

Every Contractor, Builder and Architect who wants information about all classes of Architectural Sheet Metal work should write for a copy of our 110-page illustrated catalogue.

We are doing business in every State in the Union, also Canada and Mexico, and we can do business with You. There is nothing in our line which is too large or too small for us to successfully execute for you.

Prompt shipments are our hobby. Our facilities for handling your orders promptly are the best and we keep a complete stock.

Willis Ventilators and Skylights

Can be set up by any person of ordinary ability without the use of tools or solder to make a watertight light.

They are made knock-down which reduces freight expense also chance of damage while in transit. They can be filled with any style of glass which we cut to size and pack in a separate crate. We make all styles and will quote delivered prices on receipt of your specifications.

We also make

Willis Special Double Gutter, Mould Face and Standard Roof Gutters, Cornices, Metal Store Fronts, Bay Windows, Ridge Roll and Valleys, Wall Ties and Veneer Ties, Metal Shingles, and all kinds of Architectural Sheet Metal Work.

You will be interested in our prices and workmanship as we guarantee satisfaction.

Plans sent us for estimates returned promptly with postage or express prepaid.

Willis Manufacturing Co.
Galesburg, Ill.
BIGGER PROFITS FOR THE CONTRACTOR Who Uses The WATROUS NO. 17 SCREEN HANGER

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

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

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

E. L. WATROUS MFG. CO.
DES MOINES : IOWA

The Front Rank Steel Furnace

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

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

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

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

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

freezing up in winter, and is in every way a highly convenient machine. The manufacturers of this engine have found by actual experience of its users that 3-horsepower is sufficient to run almost any machine in a small shop. Indeed, it is possible to run a number of light machines at the same time with 3-horsepower without in any way overloading the White Lily engine.

When operating on a full load, from one and a half to two gallons of gasoline per day is used, but under ordinary circumstances the consumption is less than a gallon, and costs probably 15c, including the cost of lubricating oil.

When it is realized that the White Lily engine will more than double the capacity of any shop now operated by handpower the tremendous advantage of installing such a machine is evident. Besides being exceedingly convenient, the White Lily engine is thoroughly reliable. It is manufactured by the White Lily Manufacturing Company, of 1597 Rockingham road, Davenport, Iowa, who have always made it a point to sell only such goods as they could absolutely stand behind. Every engine is sold under their guarantee (not only covering the construction but the operation and horsepower as well), which is rigidly maintained.

No question is ever raised in the few cases where some accident happens to the engine, and a purchaser of the White Lily engine may feel that he is absolutely protected in his purchase.

Every engine that goes out of the White Lily factory has been subjected to a series of tests covering four days, in actual operation of the machine, which make it practically impossible for an imperfect engine to be shipped. This policy of care and accuracy in construction has enabled the White Lily Company to establish a reputation which is unquestioned by anyone who has become familiar with them.

Believing, however, that every prospective purchaser of an engine has a right, not only to know these technical points of manufacture, but also whether or not the engine which he proposes to buy is adapted for his particular needs, a free trial policy has been adopted which is extremely liberal and which eliminates any risk whatever on the part of the purchaser. The manufacturers will pay the freight on a White Lily engine to anyone, and allow them 30 days' after its receipt in which to try it for their own work.

If for any reason it does not prove satisfactory, it may, at the expiration of this time, be returned to the factory at the expense of the manufacturers and the purchase price will be promptly refunded. A person using a 3-horsepower engine has a right, not only to know these technical points of manufacture, but also whether or not the engine which he proposes to buy is adapted for his particular needs, a free trial policy has been adopted which is extremely liberal and which eliminates any risk whatever on the part of the purchaser. The manufacturers will pay the freight on a White Lily engine to anyone, and allow them 30 days' after its receipt in which to try it for their own work.

This policy was adopted in 1908, and since that time but one engine has been returned. In this case the user shipped it back without explanation, and when it arrived at the factory it was found that it had not been handled in accordance to instructions at all, and that with the treatment which it had received no engine could possibly run.

Readers of the AMERICAN CARPENTER AND BUILDER who are operating shops without power should be much interested in this motor, and those who are using some other kind of power, or who have trouble with inconvenient or imperfectly constructed engines should be interested in corresponding with the White Lily Company, who will be very glad to answer any questions whatever, and to give them information as to any trouble which they have.

The White Lily Company maintains a bureau of information which will place at the disposal of anyone who is interested, any information which may be desired relative to their own particular work. This service will be given without any obligation whatever, as it is the desire of the White Lily Company to answer any questions which may arise in this way, depending upon the manifest superiority of its engine.
The perfection in roof construction today is Carey's Flexible Cement Roofing—the ideal roof covering. It is the one positively Standard Roof. Standard in Manufacture, in Quality, in Thickness and in Weight, year in and year out, the world over. Always uniform. Built true to a fixed standard at our factory. Its construction is not dependent upon the workmen who lay it. No roof can be a perfect roof that is manufactured by workmen on top of the building. Carey's has been recognized for over twenty years as the highest type of roof construction. It has reached a state of perfection that no other roofing material has ever attained. Carey's Flexible Cement Roofing is a combination of high-grade materials formed into a compact, flexible, indivisible sheet. The plastic cement composition, which is the body of our roof, is tempered in the process of manufacture, which insures its flexibility and renders it immune from exposure to extremes of heat or cold. The outer layers composed of weather and fire resisting materials offer additional protection to the cement composition, sealing and preserving it from destructive influences. Carey's Roofing improves with age, and gives the highest degree of efficiency and service, and is so constructed that it can be perpetuated to last the life of the building. The materials are the most durable that could be put into a roof. Not an ounce of tar is used. Carey's Roofing is the result of careful and thorough investigation and years of experience in the manufacture of roofing. The principle of its construction is scientifically correct—a fact proved by over twenty years' actual time-tests. The Carey Roof is finished complete in our own factory by expert and competent workmen, who have grown up in this business. The Carey Roof is in a class by itself.

Our patented wide lap insures a perfect union of the sheets. The result is a completed roof of practically one solid sheet over the entire surface. Carey's Roofing, because of its fire-retardent qualities, is suitable for the very highest class of construction. For all buildings—city or country—from sky-scrapers to farm buildings, warehouses to poultry sheds. Put up in rolls twenty-nine inches wide by forty-five feet in length, sufficient to cover 100 square feet, surface measure. Nails and cement for laps furnished.

Send for Free Samples and Carey's Roofing Book

The Philip Carey Mfg. Co., 30 Wayne Ave., Cincinnati, O.

Forty-five Branch Offices and Distributing Points

     Baltimore, Md. The Philip Carey Co., Nashville, Tenn.
     Boston, Mass. The Philip Carey Co., Kansas City, Mo.
     Chicago, Ill. The Philip Carey Co., Louisville, Ky.
     Cincinnati, Ohio The Philip Carey Co., New Orleans, La.
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     Dallas, Tex. The Philip Carey Co., Pittsburgh, Pa.
     Detroit, Mich. The Philip Carey Co., St. Louis, Mo.
     Harrisburg, Pa. The Philip Carey Co., St. Louis, Mo.
     Indianapolis, Ind. The Philip Carey Co., St. Louis, Mo.
     Kansas City, Mo. The Philip Carey Co., St. Louis, Mo.
     Los Angeles, Cal. The Philip Carey Co., St. Louis, Mo.
     Memphis, Tenn. The Philip Carey Co., St. Louis, Mo.
     Milwaukee, Wis. The Philip Carey Co., St. Louis, Mo.
     Minneapolis, Minn. The Philip Carey Co., St. Louis, Mo.
     Montgomery, Ala. The Philip Carey Co., St. Louis, Mo.

When writing advertisers please mention the American Carpenter and Builder
to secure for it favorable attention. It has been the custom of some concerns to provide information of this kind and to constantly pursue their correspondents with solicitations for the purchase of their goods. No such inconvenience need be anticipated by anyone who takes the trouble to ask information of the White Lily Company.

This question of modern power is a very important one, for the days of hand labor are gone by and the man who attempts to depend upon such methods in competition with others who use mechanical power is at great disadvantage. A thorough investigation of the subject will be advantageous to anyone, and probably no more convenient way can be suggested than corresponding with the White Lily Manufacturing Company, whether or not one of their engines or indeed any engine is purchased.

The White Lily Engine is illustrated on this page and a full description of it is given in the very excellent catalogue of the White Lily Manufacturing Company, which will be sent free of charge.

**Gal-va-nite Extension**

Owing to the enormous demand for Gal-va-nite—the "triple-asphalt-coated, mica-plated" roofing—the manufacturers, the Union Roofing & Manufacturing Company, of St. Paul, Minn., have of necessity greatly enlarged their plant at that point. Three large fireproof buildings of brick and concrete were recently finished, and last week a contract was let to Wm. Baumeister, Jr., of St. Paul, at $22,000 for the erection of a 2-story reinforced concrete and brick structure. With the capacity of their roofing machine-rooms trebled and with warehouses in thirty-two of the largest jobbing centers in the United States, the owners of the "mills that quality built" claim they were never quite so rushed with orders, and never were so fortunate to find themselves so well equipped to handle the demand for Gal-va-nite as at this time.

The large roofing machines of new type now being installed are of special design—made especially for the making of the "triple-asphalt-coated, mica-plated" roofing—Gal-va-nite.

**Plumbers' Nest of Saws**

A new nest of saws, being put out as No. 83 by the Simonds Manufacturing Company, of Fitchburg, Mass., and Chicago, Ill., is made up especially for the use of electricians and plumbers. The feature about this nest is that with a keyhole and a compass blade there is included a nail or metal cutting blade. The Simonds handle offers a simple but effective patented adjustment. Either one of the three blades can be readily adjusted to any working position that may be desired.

**A Quick-acting Wrench**

The Smith & Hemenway Company, of New York City, the well-known manufacturers of tools and hardware specialties, are now offering a very ingenious quick-acting wrench, the "Yemco." It is new and novel, strong and simple, unique and attractive. Very quick in action and just the wrench everybody wants. The only quick-acting wrench in which the jaw will slide to any hundredth part of an inch and hold at that point without any other movement. Pressing the button allows the jaw to open, the screw revolving without manipulation. Convenient to adjust with one hand—simply push the jaw up with the thumb and the adjustment is made. To use

---

**CARBORUNDUM SHARPENING STONES**

Put a keen, even, lasting edge on a tool and do it in half the time required by other sharpening stones. Carborundum is very hard and very sharp. It doesn't rub the edge back and forth until it breaks, as ordinary stones do—Carborundum cuts the steel and there is no unevenness or wiriness to the edge it makes.

Every Carpenter or Mechanic who loves sharp tools ought to have a Carborundum Sharpening Stone.

**THE CARBORUNDUM COMPANY**

Niagara Falls, N. Y.
More Roofing Business follows the use of "satisfaction-giving" roofing. That's why contractors should continue the use of Ford's Roofing.

**Look for the Record Behind the Roofing**

The contractor is responsible for the roofing he uses. *Good* roofing makes pleased clients and more business. Our forty-year-old reputation is an iron-clad guarantee of quality. Ford's Galvanized Rubber Roofing is just as much ahead today as it has been since 1865.

**FORD'S Galvanized Rubber Roofing**

Is made by a special manufacturing process and from special materials. The manufacturing process involves extreme heat and enormous pressure. It is the only process that insures a perfect prepared roofing.

The materials used, under this process, *must* be of extremely high quality. So every ounce of materials that enter into the manufacture are examined before being used. Thus we know the quality is there. Thus we are certain that every square foot of Ford's Roofing is *good*. That is why we take no risk in making broad guarantees.

**Roofs Covered with Ford's Roofing Are Safe**

Where a good roof is needed, use Ford's Galvanized Rubber Roofing. It's the cheapest roofing, wearing and service-giving qualities considered, at present on the American market. It is "different" to other "cut-price" prepared roofings. Not much different in price but in the quality. The Ford quality is the standard quality.

Send for samples, particulars, dealers' names and important literature.

**FORD MANUFACTURING CO.,**

2333 La Salle Street, CHICAGO
You know what is in the food you buy. The law gives you that protection.

Why shouldn't you know what is in your roofing so that you may be sure of your building's protection?

Genasco
Ready Roofing

is made of Trinidad Lake Asphalt—Nature's absolute waterproofer that doesn't crack, rot, break, or leak.

Ask your dealer for Genasco, and thus make sure of economical and lasting protection for every building you erect. Mineral and smooth surface. Guaranteed in writing and backed by our thirty-two-million-dollar organization. Look for the trade mark; take no substitute. Write for samples and the Good Roof Guide Book.

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

PHILADELPHIA
New York San Francisco Chicago

BUY A BOVEE FURNACE
Direct from the Factory
AND SAVE $50.00 TO $100.00 ON YOUR HEATING PLANT
They Actually Save from One-third to One-half of the Fuel

We have one of the best equipped furnace factories in the west and make of them furnaces of all different sizes and styles that will furnish our customers with practically any size or style of furnace they may desire, either Upright or Horizontal, sufficient to heat a large church or school house, down to a cottage. Complete with all pipe, registers and fittings for $85.00.

Our furnaces are the only furnaces having a perfect ventilating system for every part of the house. We ship our furnaces cut to fit. Any handy man can install them without the aid of a handyman. Catalogue and full specifications free.

Bovee Grinder & Furnace Works
50, 8th Street
Waterloo, Ia.

Modern Equipment for Carpenter Shops

But a few years ago, the equipment of the average carpenter shop consisted of a bench, a chest of hand tools and a few foot-power machines. But in recent years there has been a vast improvement in the equipment of these small shops. The perfection of the gasoline engine and the increasing number of electric power plants, now make it possible for even the smallest shop to have power. Carpenters and contractors are beginning to realize that their shops are very profitable establishments if equipped with power-driven woodworking machines. A few of them may feel that their business is not large enough to justify the purchase of power-driven machinery, but others who, with no better prospects, have put in machines, find that it pays.

The most important feature for the intending purchaser of woodworking machinery to keep in mind is the fact that the cheapest woodworking machine, and the one that should always be purchased, is the one that gives the longest term of satisfactory service. In every case where the small shop owner installs woodworking machinery, the efficiency of the shop is increased. He finds that he can do at a good profit many of the jobs that formerly were taken elsewhere. When in a hurry for a bit of molding or a few window frames, he can often get the entire job finished with his own equipment before a planing mill would get started on the order regular. Many of the large planing mills now work as much as possible on specialties, so that it is quite expensive for the contractor to get odd jobs of planing mill work done. It is quite true that many carpenters and contractors have such a limited amount of work for power-driven tools that they would not be justified in buying several machines, but the requirements of just this class of users has been provided for in the Crescent variety wood worker. The machine consists of an 8-inch jointer, saw table, horizontal borer, pole rounder and shaper, and an emery wheel for grinding small hand tools and mold-
The TRAINED Man Gets The Position

You wish to apply for a position—what qualifications have you to offer?
You desire to secure promotion to a better place—are you competent to hold that place?
That which decides your obtainance of a new position or promotion is your fitness for that position. You must certainly realize this. **Incompetency means failure.**

To be fitted for a good position in the occupation of your choice you must have a training that enables you to hold that position better than the average man. **This requires technical training,** as the old methods of practical experience are no longer sufficient. Almost without exception when the places higher up are to be filled it is the trained man who gets the position.

For 17 years the I. C. S. has been training men for advancement to better positions and earnings. This institution has an equipment consisting of five buildings and 3,000 employes and is backed by an invested capital of six million dollars. It has brought advancement to hundreds of thousands of men who never would have achieved the success they have obtained without I. C. S. Training. These men were in all circumstances and conditions of life when they started.

This equipment and these results all prove beyond question that **I. C. S. Training is the most powerful force for promotion in the world.** This force can be brought to bear upon your advancement in your own home, in your spare time, and without obliging you to buy books. Mark and mail the coupon below. This will bring you free full explanation of the plan telling how it can be adapted to your individual needs and pocketbook. You will never get a better position unless you make a definite attempt to fit yourself for it. **Start now by using the coupon.**
Why you should buy them

There is only one reason why you should buy one thing rather than another when there is a choice of several kinds.

That reason is the best value for your money.

Simonds Saws will give you full value for every cent you pay for them. That's the way they are made. That's the way they are warranted.

We are not talking about cheap goods—you pay a fair price, but you get what you pay for. They are Made of Simonds Steel, the best saw steel in the country. Teeth that hold their cutting edge longer and require less filing than other saws. A blade that saws true. Evenly tempered. Nicely finished. Well fitted, carved and polished apple handles. These are some of the evidences of quality in our saws.

Tell us what saw you want and we will send address of Hardware Dealers near you handling Simonds Saws, and we will also send you a free copy of an interesting booklet, "Simonds Carpenters Guide".

A Handy Device

Every carpenter has often felt the need of just such a device as is now being put out by the Peerless Specialty Company, of Rochester, N. Y.—namely, the Peerless nail set holder. It is one of those simple, much-needed devices which immediately calls out the remark—"Well! Why wasn't that thought of before?"

Remember that a nail set is a splendid tool, well built, and is meeting with general favor where there is need of several machines and where the work for each is limited. The machine will do any work that can be done on a jointer, and the change from one operation to another can be made very quickly. Without changing a single adjustment on the machine it is possible to do sawing, jointing and boring. In many cases a contractor finds it an advantage to have a machine of this kind on a job when he is erecting a large building. To meet this condition, the machine is so designed that an electric motor can be mounted under one of the jointer tables. The motor is placed on a bracket that is attached to the frame of the machine, making the entire outfit self-contained and easily moved from one place to another. With this construction it is only necessary to make a few wiring connections and the machine is ready for business wherever set. It can also be mounted on skids with a gasoline engine, and is about as easily moved as the motor-driven machine.

The machine is manufactured by the Crescent Machine Company, of 24 Main street, Leetonia, Ohio, and they will be glad to send you a circular giving complete description. At the same time ask for their complete catalogue of woodworking machinery. It contains a lot of valuable information for those who are interested in woodworking machinery.

What Every Builder Needs

Below is shown a cut of a level especially designed for builders, contractors, etc. This instrument is something that every builder should own, as it will save its cost many times
We offer Special Inducements to all Contractors and Builders putting on the first Mastic Roof in every locality where it has not been introduced.

We Will Appoint Live Selling Agents

Mastic Roofing is a guaranteed product and represents the highest type of perfected ready roofing that it is possible to produce from the best materials and with the best manufacturing equipment.

The life of any prepared roofing is determined by the quality and quantity of its coating. Mastic Roofing has a base of specially woven jute, for first strength, with a heavy ply of pure all-wool felt on the back as a cushion, the whole being bound together and heavily coated with 55 pounds of Asphalt Mastic to the square and having a mixed mica and sand finish on the weather side.

Mastic Roofing never requires painting because in our special process of manufacture it is coated with Asphalt Mastic equal in thickness to seven or eight coats of good paint.

Mastic Roofing is not the lowest-price roofing per square at first cost, but it is the cheapest and most economical in the end. It is laid the easiest and will out-last any other ready roofing made.

Contractors, Builders and Owners will find it greatly to their own advantage to investigate Mastic Roofing. It will cost you nothing to let us show you the “Hows and Whys” of its superiority.

Just write us now—today—and let us submit the best roofing proposition you ever received.

Booklets and Samples Free

National Roofing Materials Co.

Edwardsville, Ill.
No Other Roofing Has Such a Record

The ordinary ready roofing roll of 110 square feet is about half the diameter of a roll of Granite Roofing. This is because Granite Roofing is so much thicker and stronger and contains so much more material.

Granite Roofing is not a light-weight, flimsy paper, but a high-grade permanent roofing, adapted for structures of all kinds.

It is used by railroads, manufactories and on all kinds of brick and stone buildings, where it gives good service for ten to twenty years, without requiring repairs of any kind. Yet, although its price is low, no other ready roofing can compare with it for service.

Drop us a postal, and we will send you a free sample and booklet.

Eastern Granite Roofing Co.,
19 Battery Place, New York.

ZIMMERMAN'S

SEE THIS FLANGE CANNOT SAG OR TWIST
ATTACHED BY STANDARD BOLT OR VAG SCREW

HARRY ZIMMERMAN & CO., Patentees,
74 Van Buren Street
CHICAGO

 Dependable Merchandise at Lowest Prices

STEBBINS HARDWARE CO.
Chicago's Oldest, Largest and Most Reliable Hardware House

230 AMERICAN CARPENTER AND BUILDER [May

over in the course of a year, as it is particularly adapted to the leveling of walls, for laying out angles, grading streets, lots, drains, etc. It is not possible in this limited space to describe all the manifold uses of this level, but we can describe it.

This instrument has a telescope 12 inches in length, and is equipped with lenses of the very best optical quality, and magnifying power of 25 diameters. The object glass is 1½ inches. The horizontal circle has a 4½-inch diameter, which is graduated from 0-90 each way. This instrument is complete in every detail and comes packed in a polished hardwood box, with strap, plumb-bob, sun-shade, adjusting pins and trivet.

Until June first, the David White Company, No. 410 East Water street, Milwaukee, Wis., are making a special offer on this instrument which will interest every builder. They also manufacture an American Dumpy level, which has the same telescope, the same powerful lenses, but which is constructed slightly different from the before-mentioned level. They are also making a special offer on this American Dumpy. Both of these instruments are guaranteed to be absolutely perfect and are guaranteed to satisfy anyone who buys them.

Write the David White Company today. They have a very attractive proposition, and it will interest you.

Mention this paper when writing.

Straight-edge Level

The straight-edge level for setting frames and running levels is the invention of a mechanic who could find nothing on the market good enough for the purpose, so made one embodying his own ideas of how such a level should be made.

The result was that he made so good a level that Henderson & Co., Memphis, Tenn., are making them and offering them to the trade that the public might get the benefit of such a useful tool. It is all brass, nickel-plated, weighs 1½ ounces, is 2½ inches long, 2½ inches wide and ½ inch deep, and is fitted with proved glasses.

The level is used for setting frames, setting partitions, leveling joists, and for all purposes where a straight-edge is used.

The object is, by screwing the level to any straight-edge you convert it into a perfect level and eliminate the trouble of having to use a stock level or a plumb-bob; it is not affected by the wind, and you have only one tool to use in place of two.

The level is first screwed to the straight-edge as near true
Sixty Years Successful

SIXTY years of experience, reputation and constant improvement is behind every roll of Vulcanite Roofing. The high standard of quality has won for it highest honors at many expositions; the same high standard makes it the most extensively used roofing in the world.

"The roofing of ultimate saving" was what somebody called Vulcanite. We thought it appropriate—discriminative contractors have thought so since. The way we insure this "long-life" quality is like this: The base of Vulcanite is a mineral rubber compound and is positively the highest priced material used in the manufacture of ready roofing. We pay the price because the quality is there. All the felt we use is pure wool felt. We know it's good wool felt because we make it in our own mills. No paper or other cheap filler is used.

Vulcanite is very dense and firm—it's tough, yet as pliable as rubber. The sixty-years' test has proved it will not freeze or crack in winter, will not crumble in dry weather—will absolutely refuse to leak in wet weather.

To Contractors who use Good Roofing

Contractors are particularly requested to look for our name and trade-mark. Many manufacturers, who cannot imitate the roofing, imitate the name. The word "Vulcanite" and our Vulcan trade-mark is positive protection for contractors.

To dealers who sell it—to contractors who lay it—to consumers who use it—Vulcanite is a safe proposition. It's backed with positive guarantees. Everybody is protected and satisfied.

Fill out the coupon for literature and samples.

Patent Vulcanite Roofing Co.,
CHICAGO
FRANKLIN, Warren County, OHI0
as possible, and then trued up with the adjustment, by either raising or lowering the free end of the bulb. It can be removed and replaced without throwing it out of true, and does not need a recess to apply it, as the tool can be applied flat on the smooth surface, and either way does not interfere with the adjustment.

**New Factory for American Luxfer Prism Company**

A unique system of concrete construction is being employed in the erection of the new $75,000 factory for the American Luxfer Prism Company, at Thirty-seventh and Morgan streets, Chicago. This is to be made a model "day-lighted" plant through the installation of an extensive application of the Luxfer system. The building is to be 170 feet by 200 feet, two stories in height, and of fireproof construction, embodying the Mahler concrete T-beam floor and roof system.

The Mahler system of pre-constructed reinforced concrete T-beams has been developed as a result of the experience of Messrs. Postle & Mahler, the well-known architects of Chicago, in the construction of several buildings of the beam and tile construction. In short, the system is one in which the members are previously cast and cured, and are handled on the work in a manner similar to the handling of steel members. In the Luxfer prism factory only one form of beam is involved, this being laid on a steel cage frame as a floor beam.

In the building of the Luxfer Prism Company the Mahler beams are placed side by side on a fireproof steel frame, so as to form a solid floor and roof. For the surfacing of the floor, maple flooring is laid on 2 by 4 inch sleepers laid on the concrete. The roof is to have a cinder covering. The floors are designed for a live load of 125 pounds per square foot, and the beams have a 16-foot span. There will be about 2,000 of these beams, which are being cast in about 200 molds in the beam shops on the south side of Chicago.

The engineering experts of this company have applied to its factory building every necessary application of the Luxfer system to make the structure perfectly "daylight" throughout, creating a plant where the workmen may do their work under the most favorable conditions of natural illumination. The facilities for doing business will be greatly increased, and the railroad track which runs into the factory is capable of handling five cars at a time. No mechanism for the saving of time and the increase of factory productivity has been omitted in the equipment of this thoroughly modern plant, which also includes a physical

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**Mantels for Every Purpose**

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

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

Lorenzen Mantels are Ahead

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

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

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

Dollars for Contractors and Owners in Our Proposition

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

LORENZEN "The Mantel Man"

315 N. Ashland Avenue, Chicago

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

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

**Special Heating Plans Free**

Send us a rough sketch of any building you wish to heat and, without any charge or obligation on your part, we will have our experts prepare a simple, clear plan which you can easily understand, showing every detail of the furnace, pipes, registers, etc., in their proper places, with the exact cost to you of the complete equipment.

**Write For These Booklets**

Our booklet “Modern Furnace Heating” clearly explains principles that cannot be ignored if the heating of any building is to be accomplished perfectly and, at the same time economically. This booklet is written so anyone can easily understand the diagram illustrations and principles involved. It covers the entire heating proposition thoroughly and contains heating information of much value.

The booklet “These Bear Witness” gives the names and addresses of hundreds of people in every state and territory (many of them, perhaps, your neighbors) who have, and are using, the Hess Steel Furnace and outfit, and to whom we refer as having found our furnace the best in heating capacity and most inexpensive in first cost and fuel consumption. WRITE FOR THEM TODAY.

**Hess Warming & Ventilating Co.**

920 Tacoma Bldg. Chicago
He should learn the difference in quality or production of that ceiling from others on the market; what they are made from, the quality and gauge of iron; how put together "on the job," and form his own reasons why the ceiling he is to handle is the best on the market.

There is a growing demand for metal ceiling or sheet-metal decorative material. Year after year the manufacturers are pouring hundreds of thousands of squares into the buildings of this country. There are many sound reasons. While metal ceiling and sidewalls are not fireproof, they are fire preventive, rather retardive. Then again, an old storeroom, office-room or any other place can be highly decorated with a carefully studied-out metal-ceiling arrangement. Harmony of design is necessary in the selection of sidewall and ceiling material.

Very often an inexperienced person will select one ceiling design and another sidewall design, because they seem to appeal to them. The manufacturer, probably more than anyone else, will be able to make a proper selection, that is, if it cannot readily be made by the buyer.

The numerous stories that float about the country in which people are killed by falling plastered ceilings and all that, seemed to have reached their deserved end. The fact is that a first-class plaster ceiling will hold up under extraordinary use. But then a plastered ceiling in a nice storeroom, or a church or public auditorium seems such a plain, tiresome effect when more desirable effects are within reach. The modern metal ceiling is rich in relief work, and many of them carry plastic effects which seem almost impossible in "cold metal."

The school house which is to be healthful and sanitary, and fire preventive, must have metal ceiling or sidewall. Some boards are specifying such material in every new build-

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**Luxfer Prisms**

**Turn Darkness into Light**

Luxfer Prisms take the light of the sky and focus it to any part of the building.

Luxfer Prisms flood the dark places with daylight and render artificial light unnecessary.

The secret of the successful results that always follow Luxfer Prisms is in the sharp, accurately cut angles. Sheet prisms cannot give such results; they merely throw the light on one spot—Luxfer Prisms distribute it into every nook and corner. The light rays are not merely reflected; they are scientifically directed—bent—focused. They are drawn from the sky to places they would otherwise never reach.

**Contractors Can Install Luxfer Prisms**

Ninety per cent of the total installations are on our principle. This is appreciable evidence of superiority of the Luxfer system. It is testimony of the fact that architects and contractors are not risking their reputation by installing imitations.

Wherever a dark room or basement exists there is a need for Luxfer Prisms. The rental value of each room is increased, while the utility of a daylight basement is unquestionable.

Send for "Daylighting"  Drop a postal for our booklet—"Daylighting." Gives you an insight into the most advanced method of daylighting and makes interesting reading for contractors.

*American Luxfer Prism Co.*

1600 Heyworth Building  Chicago
THE PROBLEM SOLVED

You can have Modern Sanitary Plumbing installed in your home at a very low cost, for our "All Iron Pipe" system enables any handy mechanic, without previous experience, to do the work.

DON'T BE HELD UP

for an exorbitant sum in order to possess these conveniences, for we will sell you the material at lowest wholesale prices.

THERE IS NO MYSTERY

about the pipe work for plumbing. Look at the picture. The large vertical pipe at the left is the run. The smaller vertical pipe is the run. All figures are trapped in pans or gray or sewer gas escaping into the rooms, and are connected as to be properly vented. This is a fair type of sanitary installation. We will arrange any variations for you upon your request.

Whether in the city, where you have running water and sewerage, or in the country, where you have a separate water system and dispose of your own sewerage, we can have these improvements. We will sell you all the material of all kinds needed, make you working drawings, and tell you how to do the work.

JUST SEND US A PLAN

of your house for our free estimate of all the material required to put

in these modern conveniences.

A Hot Water or Steam Heating Plant

SOLD DIRECT TO YOU AT MANUFACTURER'S PRICE

Don't say you can't afford a new heating plant for your home until you get our prices. They will surprise you—and we furnish plans in such convenient form that you can install the plant in one week. Get ready for next winter now. It costs nothing to have us make an estimate for you—and we not only save you about 50% in the cost, but

We Guarantee Satisfaction

You take no chances. We write it in the contract that our plant will supply the temperature required in each and every room, and hold ourselves in readiness to supply, free of all cost, all material, should you cease to be satisfied. We will guarantee the plant at any time within one year from date of shipment, if you cannot get the results you demand. Get ready for next winter now. It costs nothing to have us make an estimate for you—and we not only save you about 50% in the cost, but

READY ROOFING

We are offering the entire factory output of mill ends of Extra High Grade Vulcan Roofing. This is the regular $3.00 grade of Ready Roofing. We are in a position to buy 100 square feet of this and sell it for $3.00. For Proof: We certify that we have permanent Weather Proof, which is already in the market. Permanently Weather Proof. The roll is limited. While it lasts at

Per square foot

95¢

Write for Free Samples. Order at Once.

Central M. & S. Co., Chicago.

C. M. & S. Co., Chicago.

$180. A first class Hot Water heating plant for this 8-room house for $180.

$127. For all the material for a hot water heating plant for this 8-room house.

$135 is all it cost for a hot water heating plant for this 8-room house cost.

STEEL ROOFING

This is made from metal used in the manufacture of soap. Never exposed to the weather and never nailed. 10 times better than the heaviest weights of new. Coated with "Gelatine". Water proof. Guaranteed proof and free from rust for 100 years. Write for Free Samples. Order at Once.

Per square foot

$1.75

Write for Free Samples. Order at Once.

We will sell you a Complete Plant with Single Fitting. No order too large, none too small. The Home of the Central Machinery & Supply Co.

The Home of the Central Machinery & Supply Co.

We will sell you a Complete Plant with Single Fitting. No order too large, none too small. The Home of the Central Machinery & Supply Co.

Our Free Catalogue No. 103, 1909, is all it cost for a hot water heating plant for this 8-room house cost.

Our Catalogue No. 103, 1909, is all it cost for a hot water heating plant for this 8-room house cost.

Our Free Catalogue No. 103, 1909, is all it cost for a hot water heating plant for this 8-room house cost.

BRADFORD REDS

SUPERIOR FRONT BRICK

Brick Fireplaces

Standards—Romans—Ornamentals

Trade Mark Reg., U. S. Pat. Office.

MANUFACTURED BY

Bradford Pressed Brick Company

Bradford Pressed Brick Company

Brady, PA.

When writing advertisers please mention the American Carpenter and Builder
ing to be erected. What about the difference in cost from a plastered ceiling. Many persons contemplate so long over this very slight difference that they forget the four-fold advantages of metal. It is a matter of difference which should not be considered in dollars or cents, if better decorative and substantial effects are sought.

For many years the sheet-metal worker alone worked in the metal ceiling field. Contractors were of the opinion that none but experienced sheet-metal workers could “trim up” the bad plates and fit them together. There was a time when irregular stamping or trimming prevailed, and even now some such material is thrown upon the market regardless of the attainment of harmonious effects.

Manufacturers realize the inharmony of bad plates, poor stamping and plates out of square, and some make special efforts towards securing perfect plates in every respect, so that when erected the ceiling will present an unbroken sheet of metal, strong in relief and pleasing in effect.

The Kanneberg Roofing & Ceiling Company, of Canton, Ohio, have undertaken to instruct the contractor and builder in the rudiments of metal ceiling selling and erection through a new edition of their large catalogue of designs. They realized long ago that a good mechanic should be able to sell and erect ceilings, if the plates are squarely stamped and they fit together with regard to a perfect design. Hundreds of carpenters and builders have availed themselves of these instructions and already are handling them as a “side line.”

This firm believes that with proper illustrations and rightly built material, any mechanic will be able to handle their product and make a workmanlike job in its erection.

The catalogue gives instruction in detail, with an endless number of illustrations of applied design, and they have reduced to a minimum the matter of selection and ordering, so that no mistake can be made. This catalogue will be sent any contractor, carpenter or builder who is in a position to undertake a profitable side line business requiring little additional work and which always is a source of pleasure and growth.

**Door Hanger Perfection**

The Allith Manufacturing Company beg to announce that they have greatly increased their output this year over any previous year—and hope the trade will accept this statement as evidence of unusual merit. The improvements that have taken place in the line assure the users of their product the highest standard attainable.

This company now invites your careful attention to their parlor door hangers, universally recommended and used by the leading architects and builders. In these parlor door hangers they use the same principle of construction that has made their Reliable round-track hanger so universally successful.

“Always on the track” is the verdict concerning the Allith Reliable parlor door hangers. They are simple, efficient, durable, noiseless, frictionless; the most popular outfit with leading architects and builders of fine homes.

This hanger is an improvement in parlor door hangers. The hanger proper and the plate for attaching to the door are made of high-carbon wrought steel. The adjusting screw...
Mr. Carpenter, Builder or Contractor
Do You Know?

The Air Cooled White Lily

Gasoline ENGINE

It will pay you to get acquainted with it, and to find out just how much it will save you in the cost of running your shop, and how it will increase your capacity.

The White Lily Engine
is small, light, convenient, but Full 3 H. P.

It costs little to run and is always ready. It is FULLY GUARANTEED. A little White Lily in your shop means a big balance in your bank. Every engine is sold on full thirty days’ trial, all freight charges paid by us. You can tell by trying—Why don’t you try? Write for full particulars and free illustrated catalog, today.

WHITE LILY MFG. CO.
1597 Rockingham Road - - DAVENPORT, IOWA.

THE BEST PROOF
that a good tin roof lasts is—that it has lasted.

MF
32 POUNDS COATING
ROOFING TIN
“The Terne which turns the elements”
is not an experiment but the result of long years of testing and service right on the roof. For ductility, durability and heavy uniform coating, MF has always maintained the highest standard of excellence.

One roofer says: “After an experience of over forty years as workman and proprietor in the tinning business, I have never found a roofing plate so satisfactory as MF.”

American Sheet and Tin Plate Company
FRICK BUILDING
PITTSBURGH, PA.
has an extra long bearing in the frame of hanger, making a very strong and positive adjustment, easily regulated without removing door casing. The wheel is brass bushed, 3½ inches in diameter, steel cased with hard fibre tread, making it absolutely noiseless. The track is a round steel track with malleable iron supports, fitting tightly inside of the track.

An improved design is now offered in the well-known Reliable door hanger. There has been no change in the principle of construction, as actual tests have proved it to be the only correct one for door hangers. The size of frame and wheels has been increased, making a more symmetrical and easier-running hanger.

The track is made in lengths of 4, 6, 8 and 10 feet. It is a heavy round steel tube, with a ¾-inch slot in the back, allowing the insertion of the track supports. This shape makes it much stronger and more rigid than a flat track. It cannot get out of line or sag. The supports are malleable iron, fitting inside of the track tightly, and may be spaced to fit any requirements.

Disston's New Book of Saws

In the matter of merit, the 1909 catalogue of Henry Disston & Sons, Inc., of Philadelphia, resembles the product of its world-famous factories, in which sixty-nine years of successful saw-making constitutes a guarantee of quality, workmanship and efficiency.

This new catalogue, just received, tells its own story, and in doing so, describes the superior characteristics of Disston saws and tools. It is a book worthy of special attention from the Pacific northwest trade, dealing as it does with every possible feature and appliance of circular, band and hand saws, backsaws, nest saws, hack saws, wood saws, saw sets, tools and files, as well as advantageous methods of use and repair. From the preface of the book we take the liberty of quoting as follows:

"As long as fifty-four years ago we recognized the importance of making our own steel in order to obtain satisfactory quality, and at that time established the first plant in America for making crucible saw steel. Since then the plant has been enlarged and improved until now it is undoubtedly the largest and best of its kind, making high-grade crucible steel peculiarly adapted and unequaled for saw and tool purposes. It is upon this well-laid foundation the Disston quality is built and uniformly assured."

Somers Brothers Blocks

In purchasing a block machine the vital question arises, will it make good blocks? To be successful a machine must not only make good blocks but it must make them rapidly. The question then arises, which is the better method, the pressure method or the tamp method? And both methods are admittedly good if the pressure or the tamp is uniform. All block men agree that to have a successful block made, one that will withstand the elements, a slushy mixture must be used.

Somers Brothers, of Urbana, Ill., have been for the past few years placing on the market a block machine that so far
Asbestos "Century" Shingles

Asbestos "Century" Shingles

Asbestos "Century" Shingles

What roofing could the architect or builder recommend if not Asbestos "Century" Shingles.

Weather-proof—moisture hastens the crystallization of the cement particles about the interlacing asbestos fibres. Elasticity defies even continuous freezing and thawing.

Fire-proof—asbestos and cement are indestructible by fire.

Accident-proof—asbestos fibres reinforce the cement in every direction.

Uniform in size and shape, easily and quickly laid, need no painting and no repairs.

Three attractive colors—Newport Gray (silver gray), Slate (blue black), and Indian Red. Numerous shapes and several sizes. Ask your Roofer for new quotations. Write for Booklet "Roofing 1908."

The Keasbey & Mattison Company, Factors

Ambler, Pennsylvania

"Triple Asphalt Coated Mica-Plated."

When you put GAL-VA-NITE on a building you can leave the job with the satisfaction of knowing that the building is well roofed. "Well roofed" means no more trouble from leaks and the expense of coating or painting every year. GAL-VA-NITE is waterproofed with mineral asphalt and is weatherproofed with a heavy "armor plating" of flaked mica. GAL-VA-NITE will not "run" in the hottest sun on the steepest roof, neither will it fail to give entire satisfaction on a flat roof. GAL-VA-NITE is put up in rolls containing one hundred and eight square feet complete with nails, lap cement and directions.

This pliable mineral-faced ready roofing is such a great improvement over all similar products and it is so much easier and cheaper to lay than shingles or tin that it is no wonder that it is being called for all over the continent.

We have warehouses all over the country and can make prompt shipment at the very lowest freight rates. Let us send you our FREE samples and convince you that "the first cost is the last cost" of a roof of GAL-VA-NITE. Our FREE roofing booklet "The Inside of an Outside Proposition" sent on request.

"For Roofing Right—Know GAL-VA-NITE."

The Keasbey & Mattison Company, Factors

Ambler, Pennsylvania

THE MANUFACTURE OF
CONCRETE HENS' NESTS

Pays enormous dividends on a very small investment

They are Sanitary—Will Last Forever. They offer a profitable field with no competition

ONE SALE MEANS A DOZEN

Every man who owns chickens is a sure customer

OUR FOLDER TELLS ALL ABOUT THEM. WRITE TODAY

B. M. BANGS & CO., Box 464C
LAKE MILLS, IOWA

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
has been uniformly successful, and has caused quite a stir among cement block manufacturers. First and foremost, their method is the pressure method, and by the construction of their machine a pressure of over 80,000 pounds is exerted directly upon the block. One does not have to be well versed in mathematics to know that with such an enormous pressure a very dense block can be made with the wettest of mixtures.

Laboratory tests in the University of Illinois show that one of these blocks made in the ordinary manner carried a maximum load of 338,000 pounds. This test will convince even the most skeptical that a block capable of sustaining such enormous weight must be good. With the Somers machine blocks can be made very rapidly, and with a minimum amount of labor, the machine doing all the work itself and not relying upon the non-uniform work of man. A man becomes tired, and his feeling is reflected upon the efforts he puts into his tamping. With the pressure machine this is done away with, giving an absolute uniformity of pressure and consequently an absolute uniformity of block which is the absolute essential of concrete block manufacture.

Somers Brothers, of Urbana, Ill., will be glad to send you their catalogue and descriptive literature. Drop them a card.

**Willis Skylights and Wall Ties**

Every carpenter and builder will be interested in the newly improved Willis ventilators and skylights now being placed upon the market by the Willis Manufacturing Company, Galesburg, Ill. The high-class sheet-metal goods of all kinds manufactured by this company; their fireproof metal window frames, sashes, stamped architectural zinc and copper work, cornices, skylights, metal ceilings and hip shingles have been known very favorably to the building trade, and their excellencies are well attested. This company is now making a specialty of a line of ventilators and skylights, which are designed to be sent in the knock-down, and can be easily set up by any person of ordinary ability without the use of special tools. This is very easily accomplished, there being no solder required to make a water-tight joint. That they can be sent in the knock-down reduces freight expenses considerably, and also lessens the chances of damage while in transit. These skylights can be fitted with any style of glass, which these people also furnish; the glass being packed in a separate crate.

We are informed that carpenters and building contractors in large numbers in all parts of the country are using these Willis ventilators and skylights, and that architects are specifying them for all kinds of buildings. Their use has been everywhere successful, the owners of the buildings being well pleased with the architectural appearance and substantial construction, and the builders being well pleased at the ease The Willis Manufacturing Company are also distributing...
Ventilation Without Risk

IVES PATENT VENTILATING LOCK

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

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

The Roof that Proves—Sun-proof and Rain-proof: Needs no Paint or Repairs

If you are interested in Roofs—the best and most economical Roofing to use, for all kinds of buildings—let us send you samples of “Rubber Sanded,” and our 32-page booklet. Write today—before you forget it.

ASPHALT AND ASPHALT PAINT

The Pioneer Roll Paper Company are refiners of Asphalt and manufacturers of Asphalt Paint—which they supply direct from their factories in Los Angeles.

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

LOW FACTORY PRICES

We sell the highest grade bicycles direct from factory to rider at lower prices than any other house. We save you $10 to $25 middlemen’s profit on every bicycle—highest grade models with Puncture-Proof tires, Coaster Brakes, pedals, etc., at prices no higher than cheap mail order bicycles. Lightest box made can be instantly applied. The only Mitre Box.

MEAD CYCLE COMPANY, Dept. 212 CHICAGO, ILL.
the well-known Willis wall tie. The illustration shown here- 
with will call to mind to thousands of builders a very well-
known article. This wall tie is made with all the care and 
thoroughness which characterizes the other products of this 
company. It is a standard article and is distributed at rock 
bottom prices.

Every reader of the American Carpenter and Builder who 
locates exact information concerning all classes of architec-
tural sheet-metal work should write for a copy of the Willis 
110-page, illustrated catalogue. It will be found very valu-
able, the information being up-to-date and reliable. It will be 
sent without charge to readers of this journal.

“A Talk with Dad”

On another page in this issue will be seen the advertise-
ment of the Dutro Manufacturing Company, of Mason City, 
Iowa. This firm is putting on the market a tool that will 
meet with the unqualified approval of every man who has 
had his trouble with sash and door fitting. A post card ad-
dressed to this company will bring to you, their little book-
let, entitled “A Talk with Dad,” and this will interest you. 
Write for it today.

The Asbestos Market

The Keasbey & Mattison Company, of Ambler, Pa., hold 
the usual annual convention of the managers of their various 
branches throughout the United States during the last week in 
March to plan the future development of the rapidly 
growing asbestos “Century” shingle, and the general asbestos 
business of that concern.

The Keasbey & Mattison Company is one of the “Big Four” 
companies controlled by Dr. R. V. Mattison, who, in addition 
to being president of the Bell Asbestos Mines, Thetford 
Mines, province of Quebec, Canada, popularly known as “the 
largest and most productive asbestos mine in the world,”
which is owned by the Keasbey & Mattison Company, is also 
president of the Asbestos Shingle, Slate & Sheathing Com-
pany, and the Asbestos Manufacturing Company, Limited, 
of Lachine, near Montreal, a recent acquisition, which is the 
first factory in Canada to be equipped for the manufacture of 
asbestos products upon a large scale.

Dr. R. V. Mattison is also a director in the Amalgamated 
Asbestos Corporation, Limited, of Canada, which will con-
tral 70 per cent of the world’s present supply of asbestos, 
which is 80 per cent of the supply from the districts of 
Thetford and Black Lake, Province of Quebec; 90 per cent 
of the world’s present supply coming from that province.

Protection Against Fire

The manufacturers of Amatite, the best known of the 
mineral-surfaced roofings, received the following letter from 
Hot Springs, Ark.:

“Dear Sirs: I want twenty more squares of Amatite and 
I will tell you why.

“I had a house gutted by fire three weeks ago, and it was 
covered with Arkansas shingles, thin shingles and a rubber 
roofing. One kitchen was covered with Amatite, and it 
seemed to the only fire-resisting roofing on the house. All of 
the other roofing was entirely destroyed. After the fire was 
put out, the Amatite roofing was standing with the exception 
of some places where the sheathing had torn out and broken 
holes through it. In fact, the major portion of the Amatite 
would have turned water after the fire.

“As I am going to rebuild, I want enough Amatite to cover 
the entire house.

“Yours respectfully,

“G. F. Malding.”

If any of our readers are not familiar with Amatite they 
should send and get a sample at once. This roofing needs 
no painting and is fire-retardent as well. Address the near-
A Test of Toughness

Not that you are expected to use your pencil as a chisel or an awl, but just to prove its toughness, this pencil was actually driven through a half inch plank. The illustration was drawn from a photograph.

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are made of straight-grained, seasoned cedar and first quality graphite, toughened to stand rough usage. It is soft, smooth and uniform in use—no hard spots or grit. Beautifully finished in lustrous paint and silver leaf.

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Manufacturers of Architectural Sheet Metal Work, Statuary, Fireproof Windows and Skylights
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est office of the Barrett Manufacturing Company, New York, Chicago, Philadelphia, Boston, St. Louis, Cleveland, Pittsburgh, Cincinnati, Kansas City, Minneapolis or New Orleans.

**Improved Tools**

Among the new products of the L. S. Starrett Company, Athol, Mass., makers of the practical tools for mechanics, is an attachment for combination squares.

The use of this attachment is so well shown by the illustrations that a further description is hardly necessary. The attachment is made to fit the 12, 18 and 24 inch blades of their Nos. 11, 23 and 33 squares, and can be used in connection with any of their regular rules as wide as 1 inch, or with their flat steel square No. 21 for laying out key seats, etc.

**Automatic Sash Holder**

The Automatic Sash Holder Company, 277 Broadway, New York, has just placed on the market a successful automatic sash holder. It is designed to automatically hold in any position required both upper and lower window sash, without using sash cord, weights or pulleys. The idea grew out of the necessities of portable house construction, where large window frames with weight pockets were impossible and superfluous material was discarded, the same conditions being adaptable to houses of cement and concrete block construction. The principle of this holder has been thoroughly tried out for several years in portable house construction, and now, greatly improved in every detail to satisfy more exacting conditions, is offered for permanent structures. The body of the holder requires only an easily made mortise in the stile of sash, about 3/4 by 3/8 by 1 1/2 inches, all of which can be done with a 3/4-inch auger bit and chisel, mortises for new work being machine mortised at the mill. When in position the wheel runs up and down on the jamb of window frame and the holder is absolutely out of sight. The two portions of the frame are formed by special machinery from 3/4-inch sheet steel. A binding or holding friction pressure is obtained by means of two electro-galvanized piano wire steel springs, which are 9/16-inch diameter and hold securely in place by large bosses stamped top and bottom in both plates. The wheel pinions revolve in two elongated or oval holes with a play of about 3/32 inch, so that as the sash is raised the wheel revolves, but when lifting ceases the wheel axles move upward in the slot, and the ratchets engage with each side of the upper plate sufficiently to hold the sash at any desired point. The company emphasizes some of the following advantages, viz.: that hardwaremen and others can buy them in sets of four, so as to retail profitably for less than the cost of weights, cords and pulleys; that while equally suitable for old or new construction, in the latter case there can be a great saving, both in material and freight, as well as bulk, by having window frames made without weight pockets; that owing to constant side pressure, windows, regardless of

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**STRICKLY MALLEABLE IRON**

Door can be taken off without removing the hinge. No other hinges made like Diehl's. Ask your dealer for them.

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- 4th Prize,—Gentleman's Solid Gold Watch Chain, value $12.00.
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SHEBOYGAN, WISCONSIN

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Must have character and character depends largely on the finish—it must be appropriate—"in keeping." Thus high class interiors demand high class finishes.

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Consult Sweet's Index (1909) pages 1282-1283.

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Patent Malleable Clamp Fixture

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Mixes sand, gravel or embankment stone—any proportion. Maximum capacity 70 yards per day. Water arrangements perfect. Uniformity and thoroughness absolute.

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WHEN

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By CHARLES PALLISER
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THIS new practical book, written by a well known expert, gives reliable directions in simple language about every step necessary to make good, substantial concrete blocks. The book will be especially valuable to the beginner in this line of work, as the hints about how to avoid faulty work will save him the loss of many dollars.

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Industrial Publication Co.
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Box Window and Door Frames for Brick, Cement, Concrete Block or Stone Buildings

The boxes on all frames are nailed together, properly fitted at top and bottom (as indicated by cut to left) to receive sill and head jamb. The brick molding is not mitered at the head as a better job can be made after the frame is fully nailed up. No arch boards or spring pieces are included in the frame, but can be furnished for 1½ cts. extra per frame. The arch boards can very readily be nailed right on top of the head brick molding.

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<thead>
<tr>
<th>Size of Frame (In.)</th>
<th>Price per Frame (Each)</th>
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<td>20x20</td>
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### Door Frames

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### Millwork and Lumber for this Fine 7-Room House

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The prices will astonish you. 5,000 bona fide Bargains in an almost endless variety of Millwork Styles. Every article guaranteed for quality. Safe delivery and Satisfaction by the Biggest Building Material Plant in America. With a paid-up Capital of $2,500,000.00. No matter who you are or where you live or what plan you do to plan in the way of building or repairing, we positively agree to save 50 per cent of your money. Isn't an offer like this worth investigating? In writing to our Bank Reference or the Editor of this paper enclose 2-cent stamp for reply. We want you to have our Grand Free Millwork & Roofing Catalog. Write to us for it today. Address

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ARE
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These clothes or fence posts are made of tube steel, filled with concrete, and are therefore

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Are easily removed, leaving lawn free for mower or other purposes.

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