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American Carpenter and Builder

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We extend to our great family of readers the compliments of the season and hope that the day brings good cheer to every one of you.

To be a good workman and to be a good foreman are two entirely different things, and the man who aspires to make his mark as a foreman must widen his field of study considerably beyond that of being a good workman. He must study methods, and above all, he must study men, and come to understand how to figure out the best that is in them and apply it in the best manner.

Dry lumber is one thing and thoroughly seasoned lumber is another, and the workman that knows the difference and is able to make the distinction can safeguard his work by making it a point to have lumber for certain specific purposes not merely dried, but thoroughly seasoned. Which means in plain English that lumber for joinery should not only be thoroughly dry, but should be tempered in the air and then dried again.

First Annual Cement Show

Owing to the desire of the majority of the intending exhibitors at the Cement Show, to be held in Chicago, December 17 to 21, to attend to the equipment and decoration of their respective spaces themselves, it has been deemed advisable to adopt this plan throughout. The prices have been reduced accordingly and include the space only; the exhibitor to furnish all signs, equipment and decoration that he desires installed.

There are to be no restrictions as to height and placing of exhibits and machinery may be placed in either the Coliseum or Annex.

Cement Users Convention

The fourth annual convention of the National Association of Cement Users will be held in Buffalo, N. Y., January 20-25, 1908. This promises to be the most enthusiastic meeting of its kind ever held. Every cement user and prospective cement user who is progressive will attend, and it would be of great value to ever user of cement to make it a point to be there. Every brand of cement will be on exhibition and the user will have an excellent opportunity to look over the various exhibits and judge for himself what brand it would be most advantageous to use. All the manufacturers will be there and it is a good opportunity to meet them personally which is always a good thing wherever possible as it may help to smooth over numerous little difficulties in future business transactions.
Mrs. Justbuilt—Did you see the beautiful presents Mr. Contractor gave his wife? An automobile and a rope of pearls—

—and Mrs. Builder got a diamond sunburst and a sealskin from Mr. Builder and—

—Oh! the stunning set of furs Mr. Carpenter bought for his wife—

—but we have the best present of them all! A new house! A home that we have looked forward to for years, what better Christmas present could we wish?
ADEN and the other health resorts of Europe may offer cures for the ordinary ills of life, but they have no remedy for the worst and most contagious of American diseases—the mania for wealth.

If there is any place in Europe where a man may be cured of his insane desire to be enormously rich it is at Versailles. Here in the gilded halls of the palace of Louis XIV one feels all the monotony and uselessness of luxury.

Versailles stands for all that human imagination and art can accomplish when there are no financial limitations, and it stands also as an everlasting witness of the poorness of our own invention.

The greatest architects of the age were entrusted with the work at Versailles. The park was planned by Le Notre, whose skill as a landscape gardener is considered even superior to his genius as an architect. This half Dutch, half English style of landscape gardening became the fashion, and it was imitated at Herrenhausen and all the lesser courts of Europe, but no one would say that these attempts to enhance Nature have been successful. One tires of the monotony and artifice of the rows of clipped yews, the endless succession of statues, the terraced lawns and great fountains.

In the palace itself the elegance is too elaborate. The rich old tapestries, the splendid pictures, the glistening chandeliers, the shining mirrors, the polished floors give one an overpowering sense of the emptiness of such meaningless grandeur.

Even "the grand monarch" himself found no satisfaction in this costly palace that he ruined France to build. His extravagance and vanity grew with gratification and the absurd adulation, the splendid fêtes, the lavish expenditure in building only added to his spirit of unrest. The lesser palace of the Grand Trianon was next planned and built and then the Petit Trianon. To this small porcelain house, about a mile from his great palace, the king used to retire at intervals with Madame de Montespan. The house was destroyed later and Louis XV ordered the architect Gabriel to rebuild a new Trianon. He came here a few days each year with his favorite, Madame du Barry, but this secluded life was little suited to the taste of either Louis XIV or Louis XV, so accustomed were they to living in the atmosphere of a servile court, where nearly two thousand servants lived to obey them and twice that number of courtiers had no other object in existence except to win the favor of these absolute despots by their cringing flattery.

No wonder Marie Antoinette found the life at Versailles unendurable. Young, vivacious and beautiful, it was hard to be hemmed in by a thousand conventions. To be handed a glass of water was a matter of severe court etiquette. A page brought it on a golden salver to a woman attendant, thence it passed to the lady-in-waiting, but, if before it could reach the queen's hand some one higher in rank entered the room, the glass went back to the door again, and the transference of the glass involved the
person of high rank as the fourth in the order of succession. At the chateau of the Petit Trianon there was less formality, and Marie Antoinette became deeply attached to the square white house and its secluded park. Louis XV admired his youthful daughter-in-law and one day when she spoke of her affection for the garden at the Petit Trianon he said, “You admire flowers, and I give you a bouquet,” and the little palace became the property of the Austrian princess.

When it was once really her own, Marie Antoinette proceeded to beautify it, to lay out a park and to enjoy this retreat as a home. There was somewhat of an atmosphere of coziness in this smaller palace in spite of its fanciful decoration, which only a lavish king could devise, and in spite of absurd surprises,
for in the dining room the table sank through the floor and reappeared as if by magic, and in the hallways were secret doorways and passages.

At the Petit Trianon the queen tried to throw aside formality and to forget the pomp and ceremony that hedged her in at court. Having once tasted the sweetness of a life that was fairly normal and human it seemed possible to simplify life even more, to be a milk maid or a shepherdess and to live in a tiny country village. There was no tiny village where a queen could go and live, so it was decided that one should be built, and a hundred yards or more from the Petit Trianon were grouped the cottages that made up the little hamlet of Marie Antoinette.

There is a pathos about everything connected with the life of the unfortunate queen, and one never feels it more than when wandering near this forsaken hamlet, which she planned just with the ordinary human desire to be happy and to be free.

One tries to people her village with her own gay company, the radiant young queen the gayest of them all. It was her will that here they should forget that she was the first lady of France. Court robes were laid aside and in her simple muslin dress and wide brimmed straw hat she was one of the villagers. Conversation was not interrupted when she came near, she could flit about, listen and talk like a common person. There were the never ending joys of country life—to fish in the lake, to watch the milking of the cows, to find some idler and saunter about the shaded paths, and best of all to call her little dog, Griffon, go to her favorite seat in the honeysuckle arbor and dream away the long afternoon.

The queen's cottage stood in the center of the hamlet—she was the proprietress of the farm. The old farm house is extremely picturesque with its rambling balconies and numerous wings and galleries, moss grown and weathered with the storms of a hundred winters.

The king was the miller and dwelt in the mill where he could hear the merry click clack of the water wheel that ground his corn. Princes lived in thatched cottages with rustic balconies and little ladder stairs that led to them. One played at being the game keeper, a count was school master, another was chaplain in the doll house of a chapel.

Countesses were dairy maids—the cream was skimmed from milk in rare old blue and white china bowls, and court beauties made butter and cheese while the dairy rang with laughter and merriment.

The Chapel of the Hamlet

The dairy is a fanciful little summer house; at one side is a vine grown archway and high watch tower, between the French windows are marble busts on pedestals—all as charming as it was useless.

The stream that flowed through the hamlet emptied into a lake, and down by the lake side were more masqueraders, washerwomen from whom princes begged favors. Nearby was the boudoir where they might retire and rehearse the day's conquests and drop off to sleep the sleep that comes only after a day's labor well done.

It was all the idlest pastime and the veriest sham—the sheep, absurdly clean, stood ready to be clipped with golden shears, sacks of grain were hoisted up mahogany stairs to the granary—but it was the nearest approach to the simple life of country people that a world-weary court found it possible to realize, and even the imitation of poverty seemed better than the reality of riches.

Today the little hamlet of Marie Antoinette is de-
serted. Of the great company of tourists who visit Versailles, not many find time for a day in this quiet corner of the woods. Old women sit on the benches in front of the house of the queen knitting and nodding. A few nurse maids rest and gossip under the trees, while the children play near the grass grown stream that no longer turns the wheel of the mill.

Time has colored the thatched roofs and damp walls of the cottages the richest shades of green and brown. No wonder the threadbare artist sits entranced through the long summer afternoon and revels in the soft coloring of the gentle, tranquil scene.
As one passes from this delicate realm of shadows into the broad avenue that leads from Versailles to Paris, there comes an overwhelming sense of the pathos and tragedy in the life of Marie Antoinette.

Torn from the world of joy that she had created for herself, she was forced to lead the hideous rabble from her palace to Paris, to endure insult and death, to expiate sins she had not committed.

The French people accused her of extravagance in building her hamlet, but it was the extravagance of inexperience and ignorance, not of wickedness. She wanted to be poor and to be happy, and tried in the only way she knew to defy the accident of birth that made her queen of the French instead of a country maiden. If the life of the humble was better than the enmity of the rich, then poor she was determined to be if it cost millions.

All of us know that it is not always altogether pleasant to be poor, but we refuse to confess what is far truer, that it does not compare with the tragedy of being unhappily rich. Throughout all time this has been the most evident of facts, to which monarchs and millionaires have testified by their own utterances, and by their own tragic experiences. A Pittsburgh millionaire remarked not long ago to some friends—"All I ever wanted was a home and Fate in irony gave me this"—and he indicated with a wave of his hand his splendid Newport mansion. "Why don't you give it away," someone suggested. "It is more difficult to get rid of the responsibility of wealth than to acquire it. Besides, if my family will not go back to the ordinary ranks of life I cannot go alone. A man can be no poorer and no richer than his wife permits," he explained wearily. Later in the day the small daughter volunteered the information that "mama tried for nine seasons to get in at Newport, and now she was in," which explained the whole story.

If you really long to be rich and are not willing to take the word of the Pittsburgh millionaire that the struggle is not worth while, go to Versailles and imagine for one moment that you have attained your desire, and you will turn from it all and thank Fortune that home to you is a New England cottage or a California bungalow.

It was the Wall street member of our company who suggested to us that Versailles might become a health resort to cure those afflicted with the mania for wealth. He had planned to build the following year in New York, but we heard him confide in his wife as they left the palace, "I guess, Sarah, we might as well spend next summer at the farm," which indicated to us a temporary cure, at least.

**Style in Building**

_Effect of Making Our Buildings Artistic—History of Various Styles of Architecture—Valuable Suggestions Given_

_By C. Bryant Schaefer_

CAN you put style into your workmanship? It does not add to the cost and brings better returns.

Ordinarily a great deal of good work is done but very little of it exhibits any style about it. Much work of pretentious aim on the contrary exhibits very bad taste.

Most people look upon good style as an additional expense. Builders put themselves to more cost, and in turn find it necessary to charge their customers a price that is often prohibitive. It is usually caused by narrow minded management. Owner, or inexperienced advisors, someone, has a notion as to what the best style is, and they insist on its being carried out regardless of every convenience. Their haste and insincerity involves extra work, so that style is considered as belonging to a class of buildings which only people with money to throw away can afford.

The classic graduate would probably contend that style in building consists in requiring owner, builder and occupant to follow certain orders of architecture that are older than national history. The contractor's daughter most likely opines that style is the newest thing out. Even some professional people follow the latest fads as their wives follow the fashion plates. It will also be found that style is considered to be a
"hit" that becomes all the rage. Most everyone wishes to make a hit with their work, yet those who are favored with pyrotechnical success usually fail to understand what fired them off. They may rest assured, however, that there is someone who knows in every case. Progress is not blind. There are imposters who recognize these circumstances and advertise to make "hits" at so much a hit, but it develops they are only hitting at the pocketbooks of persons anxious to secure popularity for their work. It is to be hoped they will not venture into the building field with their alleged systems of popularization.

Style is a spirited way of working in the usual channels. Usefulness, appropriateness and desirability have to prevail the same as ever. It is not to be found in the spreading cornices and the additional sham stories above the roofs which the cyclones used to rip off the street fronts in western cities. Not in the classic temple facades over-shadowing a dwarfed residence. Not in the lavish spread of intricate finish that encroaches upon the furniture and bric-a-brac field. Not in the breakfast food ideas which specialists endeavor to "educate the people up to." Style is common sense with a vim.

The carpenter or builder who strikes upon a good thing and has a run of favor has a useful article. It may be a door or whole building plan. He was "Johnny on the spot." He knew the requirements, the materials, whom he had to suit and why. He probably spent time and patience learning to please wisely. That was preliminary to the day when he jumped into popular favor with his work and had a rush of orders. Such do not need red tape to back them up nor book arguments either. He knew his trade. Finally he knew his trade so well that he could add a better fit to every joint, a nicer shape to every common form which he turned out. And when all his workmen would take up with his better taste then work would be produced which few could imitate, that would be appreciated for its good style, not only contemporaneously, but all the time. Although people may not eulogize such work immediately, they are nevertheless satisfied from the start. To perform such work requires discipline.

The builders of freak work, on the other hand, really expecting to accomplish great things, throw a lot of unfamiliar workmen together, who often believe in some easier way of securing their rights than by simple merit, who stumble through their work in an unfamiliar way and finally finish in a struggle to secure their pay before unintentional defects become apparent. After all the trouble is not so much theirs as the unusual requirements that are imposed upon them.

Terra cotta molders are required to pattern after stone details, and their wooden tools imply an easier mode to be more agreeable in the soft material. And so it continues. Mosaic effects with a rubber stamp,
without apparent supports, brackets that do not actually hold up anything, railings that look well but will not endure leaning against, strong lintels the inspection of which suggests too long a span. There are the plain and tame facades that do not indicate the uses of the interiors. There are those flat 4 inch and 8 inch returns that are expected to have the prominence of a 10 foot corner, then sometimes they are assisted to a stunning effect by painting the recesses black! The expense is greater and the appearance worse than any well done commission. The former elicits exclamations over the difficulties overcome. The artistic works always seems "just as easy." Unnatural things are not so important as to require people to twist themselves out of joint performing

Type, Found by Early Christians and Used for a Baptismal Font. 
work is laboriously done, bungled or ground out by marble done in oil cloth, wood paneling imitated in tin, and iron work represented by sawed wood work. All is well when each material is developed after its own nature, but when the tools are strained to represent the manner of some other tool and material, the result is bound to be very poor art. It is even tiresome to behold. 
The same is true in larger conception. Bay oriel

6. IRISH TOWER, Glonmaenoise, 
Type, Built for the Home Coming Voyagers.
tortuous labors, any how. Servitude is over when a trade has been acquired. With proficiency comes pleasure, and art is both. 
It is a simple matter to ask your tools what can be done with them. A good craftsman finds out from trying them. Then the work has to be accommodated to the needs of the customer. Corners, projections and joints may be nicely shaped and molded. Only the mechanic uses geometrical forms. The quarter round, for instance, looks better with a shaving taken off one side to make it narrower than it is high. 
When the workmen take pleasure in operating their tools and the reasonable demands of the owner are satisfied, the critical man can not find fault. But when

5. BRETON COMPASS CROSS, B.C. Originally Flat Upon The Ground Pointing North, the Carving Pointing a Voyage East.
sweat shop methods, the impression it conveys will be very poor. Art tells the truth. No matter what lavish decorations are incorporated in the work the true sentiments will be apparent. So it is that work which is done with pleasure and does not bother or cost much may secure a desirable reputation.

The great styles of architecture are renowned because of their characteristic consistency. The bad looking job is never consistent.

The Greek orders of architecture, the Oriental, Roman, Byzantine, Romanesque and Gothic styles are all familiar to builders nowadays, or one may familiarize himself through numerous illustrations and examples. It should not be overlooked, however, that they were evolved in connection with peculiar conditions, mainly those of climate and social customs.

Reproduce an outlandish style of building in a new locality and it will begin to reform the habits of the people among which it is located. It is more powerful than a book or a sermon, because it exerts a material force. It may be despised at first, but after that it becomes a curiosity and then the freak is tolerated for its novelty and finally people adapt themselves to its exactions. If people could classify their habits as well as builders classify their styles, more persons would know better where they are at.

There are also styles of building that have not been fully perfected. They indicate that the circumstances of the builders underwent a change. In continuing them where agreeable something really new may be evolved, new and enduring.

One of these unfinished styles has been chosen for illustration. It is suitable to our latitudes and the majority of our builders are descended from its creators, who occupied western Europe in remote ages. Its consideration is appropriate to this season, for it is inherited from the races who gave us our Christmas tree observances.

The Norman arches were carved with boat ing objects. These became rope moldings, fish scale masonry, mast-like corners and look-out projections. As this beautiful style approached perfection as an ornamental art it ceased.

Just to demonstrate how new ideas are developed we will take the Saxon-Norman details in our illustrations and devise something wholly new.

Among the Saxons the joint in the arch was the main thing. Among the Normans the carved prow heads were the essential feature. Originally, we will say, they changed the blocks around to represent the location of their boats. They were adjustable.

Take a lot of triangular pieces of plank, overlap them with other pieces, put a pin through the corners and there is a built up wood arch. Drive wedges into the joints and it becomes adjustable, by adding more blocks it may be made larger. I never heard of such an arch and am sure it may be found very convenient.

The Saxon-Normans did not barter their work for a price. You will find it will not cost you anything to make one of these arches. The useless ends sawed off from joists and the angles cut out of stair stringers are just the thing. Try it. The work will be found to look well and, as I said, it does not cost anything extra to be artistic.
How to Use the Steel Square

FOR our subject this month we will take that of framing a dormer gable where long and short valleys are used at the intersection of the roofs. The subject was pretty well covered in an answer to an inquiry in the October AMERICAN CARPENTER AND BUILDER, but in order to cover the subject of framing ridge, B —

Fig. 162 represents the plan and the corresponding elevation of the valleys in the roof. For an example, 4 feet is taken for the run of the main roof and 8 feet for that of the gable. The roof of the main part and that of the gable being of the same pitch, it is evident that the ridge of the latter will be below that of the former, as the rise is to the difference in their runs. A-B represents the run of the long valley and A'D that of the short valley. Thus it will be seen that valleys framed in this way are self-supporting. That part from D to B is what is generally termed "Blind Valley," because it is concealed in the plane of the main roof. The measurement should be taken along the center of the back of the valley, as shown by the dotted lines, and if backed, or more properly speak-

Fig. 163.
for a hip to bring the center in plane with the common rafter.

Fig. 163 shows the plan of the valleys at the intersection on a larger scale. In this, the sections are shown grooved below the intersection, and in that case that part called the blind valley should be beveled one way, as shown. This part, while it may look out of place in the illustration, will be found to conform with the roof planes when set in position. In large or heavy roofs, the valleys should be doubled and in

that case it is an easy matter to groove the backs by simply backing them one way only and then spike them together so as to form the groove. In other words, they would show the same as in the illustration by letting the center line represent the joining of the two pieces.

Another point comes up in this connection, that should not be overlooked before passing on, and that is the joining of the short valley to the long one. Simple as it is, builders sometimes do not readily grasp that it is nothing more than the plumb cut for the valley. It rests at right angles from the long valley and therefore must rest square against it just the same as if against a level piece, and in this example the pitch being 3/6 or 9 inch rise to the foot, we let 12 on the tongue of square No. 1 represent the starting point, and 9 on the blade the rise. The run of the main roof being 14 feet, measure back 14 inches along the line of the tongue and draw a line parallel to the blade to opposite 14 inches on that member, as at B' B. The line from A to B will represent the run of the long valley. Now by placing 17 on the tongue of square No. 2 at 12 on the square No. 1 and with the tongue along the line A-B the heel will rest at 12 on square No. 1. Since the rise is 9 inches to the foot, a line from A passing at 9 on the square No. 2 and intersecting the line B-E' (the rise of the main roof) will represent the long valley, and the line passing at 9 on square No. 1 intersecting the line B' B as at E will represent the common rafter for the main part.

Now since the run of the small gable is 8 feet, measure back 8 inches on square No. 1 and draw the lines C-D and D-F at right angles from the tongue of the respective squares. A-F' will represent the short valley and A-F the corresponding common rafter to a scale of one inch to the foot. The figures shown on the square intersected by the lines A-E and A-E'
will give the seat and plumb cuts of the common and valley rafters respectively. The length of the diagonal lines on the squares are 19½ and 15 inches and these figures taken on the blade of the respective squares will give the side cuts for the valley and jack rafters.

In this illustration we have used two scales, i.e., the full scale on the steel square for a one foot run to obtain the cuts, and the 1-12 scale or one inch to the foot run for the diagram of the roof, from which to obtain the length of the rafters. The fact that there are two scales employed may render the subject harder to grasp by some, but we trust after a little study of this illustration, the subject will be clear. The reader will observe that in all of our work we have adhered to 12 on the tongue as the starting point. We do this because it represents unity or the beginning, and therefore answers for any run or pitch given the roof. However, as a comparison it might be well to illustrate this problem per the one inch scale to the foot. Bear in mind that while we illustrate these problems with two squares, only one is necessary, as the angles may be laid out with the different positions of the square and the required proportions taken on same. As the run of the small gable is 8 feet, place the blade of square No. 2 at 8 on both the tongue and blade, with the heel opposite 14 of square No. 1 (because 14 represents the run of the main roof). Now since the rise is 9 inches to the foot, for 14 feet, it would be 10 feet, 6 inches. Then the line from 19½ to 10½ will be of the same length as A E of like letters in the previous illustrations. By drawing the line D-F' at right angles to the blade, A-F' will represent the length of the short valley. As for the lengths of the common rafters, it is an easy matter to get per the scale method by simply taking the run and rise of the roof on the tongue and blade and measure diagonally across. However, while this does for working purposes for the more common run of work it is not absolutely a correct method, because the least variation is magnified twelve-fold.

How to Make and Read Drawings
SERIES OF ARTICLES ON MAKING AND READING DRAWINGS FOR A BUILDING—FROM THE INSTRUMENTS TO USE TO THE MEANING OF EVERY LINE

By Wm. C. A. Stevenson

BEFORE we start with this very important subject let me make a few brief introductory remarks, as this is a matter that every carpenter, be he journeyman or master, should be deeply interested in. The journeyman can never expect to gain the confidence of his employer, or get to the higher positions in his trade unless he understands how to make and read drawings. The master cannot

and you have nothing to show that you were not to do it. Now if you could get up a plan for the job, it will show what you are going to do. Your customer will have more confidence in you and will give you a better price than he would without the plan. It is also much easier to see what materials you require, etc. There are so many different ways of doing almost every job that one man will offer to do the work for one price and another want perhaps 25 to 50 per cent more, intending to do a better job; but without the plan, the customer cannot see the difference, hence the great advantage to the man who produces the plan.

Now, what I propose to do is to start with the very first principles and continue on until I show how to draw the complete set of plans and details for a residence. In drawing plans, you have the different plans, namely, basement, ground floor, first floor, and up for as many floors as required, also the roof plan, each showing the layout on the level or horizontal plane, on the line through which you are planning.

Every different material used is shown in a slightly different manner on the plan, which will be explained as we proceed. Then we have the elevations showing the upright from the grade line to top of roofs and chimney, each side separate. We also have the sectional view or views.

This shows the building cut in two, showing the manner of construction, the different material used, size, etc. This is a very important view, as will be shown. Next come the details showing the manner and style of construction of each part. These plans must be drawn to an accurate scale, as ½ inch—¼ inch, etc., as the case may be, to the foot, in order to
be of any use to work to. Details are usually drawn one-quarter, one-half or full size. As we proceed we will show how all these different plans, parts, etc., are drawn. The instruments required to begin with are: First, the drawing board and T square, a scale, a pair of triangles of 30, 45, 60 and 90 degrees, a curve, protractor, a case containing the dividers, compasses, ruling pen, bow pen and bow pencil. This outfit can be obtained very reasonable from any reliable supply house.

At Fig. 1 is shown six different lines used in drawing: each one plays its own part and should never be used out of its proper place. Line (1), the light full line, is the one mostly used, being used to outline all pieces and objects on either the plans, elevations, sections or details that can be seen with the eye.

Line (2), the dotted line, is used to show any object that is hidden behind, under or above some other object, such as the flue in the chimney, the beam below a floor, etc.

Line (3), the broken and dotted line, is used to indicate the center line of figures, and is also used to show on the plan where a sectional view has been taken when one is shown. It is also used for projection lines from one object to another—such as points from one elevation to points on same horizontal on another.

Line (4), the broken line, is used for dimension lines to mark distances from one point to another.

Line (5), the heavy full lines, are used for shade lines and should be twice as heavy as line (1), heavier if required. It is also used for border lines.

Line (6), the zigzag line, is used to show that only a portion of the plan or view has been shown and the portion beyond the zigzag line is not shown. These lines will be explained as used.

At Fig. 2 we show the manner of showing materials.

(1) shows how the walls of a frame house would be shown on plan by using two lines drawn parallel to each other indicating the outside of the wall. (2) would mean the same, being a slightly different method. (3) and (4) shows a solid wall of stone or brick, being two methods used.

(5) is concrete. The outline of all these are Line 1, Fig. 1.

(6) shows a concrete footing with brick on top. The brick would be lined as at S if it was a section view; if a face view as at R. Note the manner of showing the soil, below footing.

(7) shows a rock face stone footing with stone walls above. For a section it would be lined as at T; face view as at U.

(8) shows the section of a floor and ceiling below showing the end wood of joist, the floor running across lined to represent the direction of grain of wood, lath and plaster below.

A Hard Job

There is an old Irishman in Baltimore who for many years was prosperous as a grocer. Not long ago, however, the old fellow lost his all in “a side line,” and was compelled to look for a job. Through the influence of a friend he was offered the position of crossing-tender at a small railroad station in Maryland.

The Celt looked dubious as the duties of the office were explained to him and the meaning of the various flags was stated.

“In case of danger, you wave the red flag,” explained the man told off to instruct Mike.

“Wait a bit, wait a bit,” interrupted Mike, with a doubtful shake of the head. “I’m afraid this job’d be too much for me. I could never trust mesilf to remember to wave a red flag whin there was a green wan handy.”—Harper’s Weekly.

The Century in 1908

The fascinating problem of the possible—Professor Lowell says the certain—existence of life on Mars today, is to be discussed fully, authoritatively, yet so that the general reader lacking in scientific training may understand and enjoy, in the new volume of The Century. In his discussion of “Mars as a Possible Abode of Life”—papers based upon his very successful popular lectures delivered last winter before the Lowell Institute, Boston, Professor Lowell will present the most important latest astronomical discoveries and theories; and the illustrations will include reproductions from photographs of the planet, taken under unusually favorable circumstances during the summer just passed.

The AMERICAN CARPENTER AND BUILDER is O. K. It is just simply grand.—H. D. Meyer, Marion, Tex.
The roof framing problem is one of particular interest to the carpenter who has the framing part of the building construction to look after. Every roof framer is looking for new and easy solutions of the roof framing problems. Now here comes Hicks with his A B C method, the simplest and easiest of all. There are no lengthy drafts to make, no intricate cross lines to follow and get tangled up in, all you need to determine the lengths and cuts of any rafter is the ordinary steel square and a piece of 2 by 4, or any piece of a board with one straight edge to 6 feet long. For example we will suppose we have a building 18 feet wide with a gable roof and a pitch of 10 inches rise to the foot. Half the width of the building is 9 feet, and 10 inches rise to the foot would be 90 inches or 7 1/2 feet. Now, see Fig. 1, lay your square on the straight edge of your 2 by 4 or board with 9 inches on the blade and 7 1/2 inches on the tongue, then the distance from A to B represents the length of the common rafter, which in this case is 11 feet 8 1/2 inches. The blade gives the bottom cut and the tongue the top cut. It has long been a custom to let the figure 12 on one side of a square represent the run of a rafter as a basis to work from, and to determine what the other figures should be by the pitch of roof to the foot run. This part is all right, and works out right if the right principle is correctly followed. Now the pitch of the roof we have illustrated is 10 and 12, 12 inches run to 10 inches rise, and these figures will cut the proper bevels for the top and bottom of the rafters just the same as the figures 9 and 7 1/2 will do as shown in Fig. 3, but the figures 10 and 12 do not represent the length of rafter, whereas the figures 9 and 7 1/2 represent both the length and the proper cuts; this is where the advantage is, and this advantage will be found to be a great advantage in fractional parts of the runs of rafters, such as are often found on porch roof and other flat roofs. This plan will work on any pitch of roof, and on porch roofs and odd runs, its advantage will be found to excel all other methods. Now suppose we have some jack rafters. Space them off as shown by the lines 1, 1, and 2, 2, and the distance from 1 to 1 and 2 to 2, and so on, represents the length of jacks, and the top and bottom cuts are the same as the common rafter. How about the bevel across the back of the jack? This is, of course, different, but we have the figures in Fig. 1 that give this bevel. We found the length of common rafter to be 11 feet 8 1/2 inches; now 8 1/2 inches is almost 3/4 of a foot, only lacks 1/4 inch of it, so we will call it 3/4 of a foot and take 11 3/4 inches, the distance from A to B, on the blade of the square, and the 9 inches on the tongue, the distance from A to C, and the blade will give the cut across the back of the jack rafters.

Now if there is a hip or valley let's see if we can
find the lengths and cuts by the easy A B C method. We now take our square and lay it on our straight edge at the figures 9 and 9, then the distance from A to B in Fig. 2 represents the run of the hip, and which in this case is 12 feet 9 inches or 1234 feet. We now take the square again (see Fig. 3) with the 1234 feet just obtained, and which we represent on the square by inches on the blade, and the 7 1/2 inches on the tongue, which is the same as C, B in Fig. 1. Then the distance from A to B in Fig. 3 is the length of hip or valley, and in this case is 14 feet 9 1/4 inches. The figures 12 3/4, A to C, makes the bottom cut, and the figure 7 1/4, C to B, makes the top cut.

How about the cut across the back where the top cuts against the side of a deck ridge or side of a building? These figures are right there in Fig. 3, and are 12 3/4 on the blade and 14 3/4 on the tongue, and the tongue gives the cut. Where do we get the 14 3/4; the distance from A to B is 14 feet 9 1/4 inches, the 1/4 inch is so small that it would cut no figure with the bevel when applied as shown in Fig. 3, so we drop it and the 9 inches represents 3/4 of a foot; so we take 14 3/4 inches on the tongue of the square, the distance from A to B in Fig. 3, and 12 3/4 inches on the blade, the distance from A to C, and the tongue gives the proper cut. So much for the A B C method of cutting rafters. Try it and you will soon be able to cut any old rafter by the simplest method, and a method you can depend upon if you follow it correctly; that is, use the proper figures on the square to represent the run and rise. All good squares are marked on one side in twelfths of an inch, and we recommend that you use this side of the square and let your scale be represented by one inch to the foot, then every twelfth of an inch on the square will represent an inch on the rafter and every inch a foot. With this scale and this side of the square, feet and inches can be figured without any difficulty.

**Truss Construction**

*SHOWING SOME OF THE SIMPLEST FORMS IN CONNECTION WITH THE HOWE TRUSS—SIZES TO USE FOR THE VARIOUS PARTS*

By T. P. Ellis

The design and construction of trusses is a specialty to which some mechanics confine themselves more or less exclusively and thus attain a degree of expertness beyond the reach of the average workman. If such persons should complain that they find nothing of interest in this article the writer would merely remind them that it was not his intention that they should. But since a great many mechanics have occasion to build trusses and are not familiar with the principle involved, I submit this article with the hope that it will be of benefit to some one.

The principle of a truss is theoretically a number of straight bars joined near their ends by flexible joints, and arranged so that all their internal stresses are sustained by its members and only the vertical pressures (the weights of the truss and its load) are transmitted to its abutments. They differ from solid beams inasmuch as the weight of the truss and its load may be regarded as divided into portions which are concentrated at their joints between the members and which act through the centers of gravity of their cross sections. So placed, the stresses caused by them could not act transversely of the members, "as in a beam," causing secondary stresses, but must act longitudinally of the members and must be uniformly distributed over their entire cross sectional areas. This is the distinguishing feature of all trusses. While in a solid beam, when it bends under its load or own weight, all the fibers above the neutral axis are compressed, while all those below are extended, and the resulting change of length in each fiber is proportional to the distance of the fiber from the neutral axis.

Most of the trusses in common use consist of two long members, called chords, extending the entire length of the span and connected by web members, which are sometimes all inclined and sometimes alternately vertical and inclined. Inclined web members are called diagonals, such web members being known as ties and struts. A member sustaining tension is called a rod or tie, and one sustaining compression is called a strut or post, while one capable of sustaining both tension and compression is called a tie strut.

The simplest forms of trusses consist of a single triangle (Figs. 1 and 2, (a) and (b)), which in (a) is in compression in the rafters and tension in the chord or tie rod, and *vice versa* in (b). This of
course is in common use for roofs of small span, as in dwellings, and in practice is of course loaded along the rafter, and not only at the apex as in (a), Fig. 1, but in calculating the stresses as in the members we commonly first assume that the loads are concentrated

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at the intersection of the truss members, and the effect of actual distribution along the members is then determined, separately treating the members as beams.

In Fig 2 (a) is shown a king truss in which the vertical tie (improperly called a king post) and in Fig 2 (b) the vertical post simply carries the weight to the apex where it produces the same effect as in Fig. 1 (a) and (b), so that leaving off the weights of the vertical tie and other members, the stresses caused by a given load in the diagonals and in the horizontal tie, Fig. 2 (a), are the same as those produced by an equal load in Fig. 1 (a). Similarly, those in Fig. 1 (b) and Fig. 2 (b) correspond.

In Figs. 3, 4 and 5 are shown simple forms of the principle of most all of the trusses in common use up to 300 or 400 feet span, there being an upper chord in compression, and a lower chord in tension; the shorter chord sustaining the compression between the heads of the rafters Fig. 1 (a) and (b), or the horizontal tension between the feet of the diagonals, Fig.

\[ \text{Fig. 3.} \]

Fig. 3 (a), or tension, Fig. 3 (b), on the two ends of the shorter chord are equal, the two diagonal counters in the center are unnecessary.

But as we have to provide for the passage of the load, which would be unsymmetrically placed, let us suppose the truss to be loaded only at (c), Fig. 3 (a) and (b); it is plainly apparent that the omission or removal of the diagonal counters would cause failure as indicated by dotted lines.

In Fig. 4 (a) and (b) are shown the Howe and Pratt systems; in (a) the vertical members are in tension and the diagonals in compression, embodying the “Howe” principle, used in bridges with wooden diagonals. While in Fig 4 (b) the verticals are in compression and the diagonals are in tension, embodying the “Pratt” principle, used in bridges with metal diagonals. In such trusses long compression members should be avoided.

In Fig. 5 is shown what is known as the Warren or triangular truss, in which all the web members are diagonal and are alternately in tension and in compression, and may be regarded as embodying the same principle as the “Old Towne Lattice” truss (consisting of planks crossing each other, usually at right angle, and being bolted or trenailed at their intersections), which forms a combination of several “Warren” trusses, and also the same principle in lattice girders.
So far, we have considered only horizontal pressures, with the assumption of course, that it is understood that "sway" or portal bracing is necessary to take care of the lateral stresses, and that in any of the trusses with two horizontal chord members the roadway may be carried on either the upper or lower chord. With the roadway carried on the upper chord they are called deck spans and may be sway braced below. But where the roadway is carried on the lower chord, the truss would have to be deep enough to allow the load to pass under the top lateral and portal braces, otherwise it may be braced to the floor beams by letting same extend through on each side far enough to receive the end of braces and tie rod. This method of bracing however serves only to hold the truss in an upright position, depending on the lateral bracing between bottom chord to take care of the lateral stresses. But in pony trusses, which are too low to permit top lateral and portal braces, this form of braces will be found sufficient.

Further modification of these designs, with more numerous panels, might be shown and a volume written on them, but as the Fig. 5 shown illustrates the principle involved we will not attempt to confine them within this article, but will show some of the most common forms of roof trusses. In Fig. 6 (a) it will be seen that a part of the load at (d) compresses the rafter from (d) to (a), while the remainder compresses the strut (d) (h) and pulls the rod (h) (i) and the part chord h a. Similarly, part of c passes through a to a and the remainder through c k d h i to the apex i, thus each load is carried eventually by its members, part to the apex and part along the rafter to the abutments. It will be seen that the greatest stresses in the rafters and in the chord occur near the ends. Sometimes the members shown vertical in Fig. (a) are inclined or the lower chord is broken; being usually convex upward. Roof trusses are often composed of two Fink trusses, inclined and leaning against each other at the top, and their feet being held in position by a tie, m n, and the rafters forming the upper chords of the Fink trusses. If the diagonals were parallel their stresses and those in the verticals would be greatest in the center of the span and least in the abutments. Before the stresses can be calculated and the truss proportioned to those stresses its weight must be known; for this constitutes a load, and therefore affects the stresses. But, on the other hand, we cannot learn its weight until we know the sizes of its different members, so in this dilemma we assume for it an approximate weight based on our knowledge of a somewhat similar structure already built. This becomes the more necessary as the size of the truss increases so that its own weight becomes greater in proportion than that of the load.

Fig. 7 illustrates a small wooden Howe truss bridge. The top and bottom chords are made up of three or more parallel timbers, c c c, placed a small distance apart so as to let the tubes on the angle blocks which receive the tie rods, r r, pass between them. The main braces, o o, are in pairs or in threes, the pieces composing them abut at top and at bottom against triangular angle blocks (see Fig. 9), which are usually made of cast iron, being hollow and about one-half
an inch thick, and strengthened by inner ribs. These blocks extend across the three or more chord pieces, having two or more hollow tubes extending down between the chord members with the tie rods passing through the tubes, which are of such length as to come flush with bottom of chord (in the lower and top in the upper chord), the object being to prevent the pressure on the diagonals from crushing the chord by letting the strain of the plate washer on the tie rod rest on the end of the angle block tube.

Owing to the length of the chord members they are usually spliced, and as the lower chord is a member in tension the joints are clamped as shown in Fig. 9, the clamps being gained about an inch and a half and the key blocks about one inch into the chord, the chord bolts passing through the whole.

As the top chord is a compression member it is not necessary to clamp it, but all joints should fit close so as to make compression even throughout.

In practice, the members of the upper and lower chords of bridges are not placed perfectly in line, but so that the chords curve slightly with the convex side upward. This curve is called the camber. Its object is to prevent the truss from bending down below a horizontal line when heavily loaded when they are cambered (see d s and c d, Fig. 8); they become approximately concentric arcs of two large circles, of which the center is at t; the upper one plainly becomes longer than the lower one. The verticals instead of remaining truly vertical become portions of radii of the arcs mentioned, and although their lengths remain unchanged their tops are farther apart than their feet, and this renders it necessary to lengthen the diagonals.

If we divide the span in feet by 50 the quotient will be ordinarily a sufficient camber in inches; this amounts to one in 600; the camber to be used is, however, usually stipulated in the specifications. A well built bridge of good design should not, under its greatest load, deflect more than about one inch for each 100 feet of its span; in fact, the deflection is frequently much less than this. The excess of length of the upper chord over that of the lower one will be

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\frac{8 \times \text{depth} \times \text{camber}}{\text{span}}
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This rule applies closely with any camber not exceeding .002 of the span. After the bottom chord has been placed and bolted together, staging or false work can be put in place for top chord, and should be about one-half inch higher than the distance between chords to allow the diagonals to be placed on the angle blocks; the two main diagonals abut against one side of the angle block and the counters pass between them and abut against the other side of angle block, so that the main braces rest against the two outer ends of the face of angle block and the counter brace rests against the center, they being bolted together at their intersections. After it is all assembled the chord can be let down (commenc ing in the center) and tie rods tightening up, this will lift lower chord (in fact, the whole truss) clear of its supports and cause it to swing clear. The end post p d, the end ties i c and b y, and the horizontal g i and w b of the upper chord form no part of the truss proper, the chord simply acting as beams supporting the load during its passage from the abutments to the truss, and vice versa.
A Modern Library Building

ON THE following pages we are showing a complete set of plans for a convenient and handsome library, suitable for a town of 5,000 population. These plans were prepared by G. W. Ashby for a building erected at Glasgow, Mont. The plans show it to be a very complete building in every respect, yet inexpensive in construction. Two shades of brick are used for the exterior walls with native cut stone trimmings. The cornice is of wood painted and sanded in color to match the stone. The roof
is of the ordinary wood and shingle construction. The basement is finished off with two large club rooms, separated by the hall, with wide arches leading to either room. Two commodious toilet rooms are also

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FIRST FLOOR PLAN
OF PUBLIC LIBRARY
GLASGOW MONTANA
located on this floor while the remainder of the space is taken up with the necessary furnace and fuel rooms. The basement rooms projecting high enough above grade to admit large windows to sufficiently light all parts. The main floor contains two large reading rooms separated by the delivery room which is at the central part, thus giving the librarian a good view of what is going on in the reading rooms. The stack room is in the rear and occupies about one-third of the whole floor space. Large triple windows on all sides furnish abundant light for the several rooms, which helps to make all that could be desired in a moderate cost building for the purpose for which it is intended.

The interior finish is of yellow pine, simple in design, as shown by the accompanying drawings.

**Material Used in San Francisco Reconstruction**

**MANY KINDS OF FANCY FACE BRICK USED—REINFORCED CONCRETE AND STEEL STRUCTURES NOW TAKING LEAD**

**By H. A. Crafts**

The rebuilding of San Francisco presents an extremely interesting study. First came the construction of the vast area of temporary frame buildings to accommodate the business that had been rudely dispossessed by the earthquake and fire, and to house the homeless. Not a few of these structures were built literally upon the ruins. Contemporaneous with this era was the beginning of the work of clearing up the debris and carting it away.

Just as soon as a site could be cleared the work of reconstruction began. At first such building material as was at hand, or that which could be secured within a comparatively short time was put to use. One of the most valuable materials that was available for immediate use was the second hand brick that lay in great masses among the ruins.

Upon this material a vast army of men was put to work, digging out the brick, cleaning them of the dry mortar adhering to them, stacking them or hauling them away to be used at some neighboring building site.

At first these old brick were looked upon as being so much waste matter, but when it became patent that the securing of new building material in adequate quantities for general reconstruction would be a slow process, and when it dawned upon the minds of the rebuilders that these old brick had been put to the severest test, and that those surviving would provide substantial material for reconstruction, and that, furthermore, they were right on the ground, they advanced rapidly in public estimation, and it was not long before they were selling at the base rate of new brick, i.e., $12.50 per thousand.

These old brick have been, and are being, used not only in foundation, inside walls, party walls, back walls, etc., but in front walls. But this class of construction has been principally done south of Market street, where the big warehouses, foundries, factories, etc., are situated. But you will see second hand brick fronts even on Market street; but as they have not gone into buildings of more than two stories in height it is to be presumed that it is the intention to build higher in the future, and at the same time put in more pretentious fronts.

In other cases second hand brick fronts have been ornamented with some kind of trimming—new red pressed brick, rock face vitrified brick, etc., or covered entirely by cement plaster or stucco.

Reinforced concrete was early in the field and at one time appeared to be on the top wave. But for the past few months the supply of steel from the east has been coming in very liberally and the skeleton frames of the big business blocks and sky scrapers are going up on all sides. In parts of the downtown section of the city the clamor of the sledge and trip hammer are almost deafening at times.

(Continued on page 349)
Constructing a Water Filter

MATERIAL NECESSARY TO PRODUCE THE PURIFICATION OF THE WATER—METHOD OF FINISHING MONOLITHIC CONCRETE

By Fred W. Hagloch

WHILE it is a well-known fact that the proper way to purify water is by distilling or boiling; but this is too expensive and a large percentage of our pure water sold has been only filtered. We illustrate a sectional view of a simple, but one of the best filters made, which should not be smaller than two feet deep, one foot wide and six feet long, which will have a capacity of two to ten gallons per minute, depending upon the amount of impurities the water contains, but the size that gives the best satisfaction is four feet deep and twelve feet long, the width depending upon the capacity desired which with ordinary water is about five gallons per minute for every foot width of the filter.

This filter as shown is built in the ground with the water inlet one foot higher than the discharge, and therefore is a gravity filter of the slow sand type, being the system most adopted by our larger cities where filtering water is a necessity as a safeguard to health.

This filter is made of concrete, walls and bottom six inches thick and the interior sides waterproofed to avoid waste of water. The settling basin should be deeper than any other section, to allow the sand or soil to settle and remain undisturbed in its bottom, which must be removed when filled up to the inlet openings into the gravel and sand section, these openings being one inch in diameter and about four inches apart, the filtering section should contain one foot of gravel, crushed stone or clean slag in the bottom, which is covered with about eighteen inches of coarse, clean, sharp sand which must not reach the overflow level at the top.

The charcoal section being for purifying the water with air, should be filled with porous materials, char-

A filter of this type has been in use the past sum-

mer filtering muddy and oily water for supplying clean water for steam purposes, the oil being removed twice a day by skimming the surface of settling basin, the filtered waste also being used for drinking and cooking, but is not altogether free from the oil taste.

Another filter made of size given above produces clear, sparkling water from river water containing the refuse of coal mines and tanneries, which is considered remarkable, as the sand, gravel and chacoal are changed only four times per year and the filter is in use night and day continuously.

**Finishing Monolithic Concrete**

Concrete made in forms whose face or exterior surfaces are exposed are finished so as to cover the aggregates the concrete contains, which is accomplished by one of the following four methods:

The most expensive and nearly always inferior is to face the material while in place (filling the form) with a richer mix and omitting the aggregates.

A better method, but sometimes inferior, is to plaster after the concrete has become hard with cement plaster, but if not properly applied this will scale, besides often increasing the thickness of the wall more than the required size, causing a waste of material.

The most popular method is the spade or blade finish, which is accomplished by spading the side of the form while filling, as the blade drives the aggregates from the surface, allowing the finer sand and cement to form a solid face, especially if the spade or blade used has been freely perforated with holes about half an inch in diameter.

Recently I tried a method requiring less labor that produced an ideal surface, free from the honeycombed spots which are so common where the spade method is employed. The method is to rap or jar the outside of the form with a light hammer before the cement has set, being careful to give a uniform blow and cover the entire surface so that the hammer marks on the outside of the form are not over two inches apart, using a two pound hammer on one inch forms and a three pound hammer on forms built of two inch sheeting.

The last method will make a solid as well as the most waterproof surface possible without chemicals, but requires a little practice and patience to learn; yet when we consider a concrete made of one, three and five, within surfaced forms, producing an elegant watertight surface we realize that it is worth while.

**The Strength of Structural Timber**

Before putting a timber into a structure every builder must know the strength of the timber and the maximum load it will have to carry. Building laws generally require that the material used shall be from three to six times as strong as is actually necessary.

Loblolly, longleaf and Norway pines and tamarack are among the principal structural timbers of the east-ern United States, and Douglas fir and western hemlock of the western. In the trade, loblolly pine is classed both as Virginia pine and as North Carolina pine. Virginia pine is made up principally of material from the northern part of the loblolly pine belt, and is inferior in quality to the North Carolina pine, so that the distinction is one of grade rather than one of locality. Longleaf yellow pine as known on the market may include the better grades of short-leaf pine and Cuban pine. It has for a long time been the standard construction timber of the east. Norway pine, also known as red pine, is lumbered principally in Michigan, Wisconsin and Minnesota, where it is marketed with white pine as northern pine. Douglas fir, called in different localities yellow fir, red fir, Oregon pine and Douglas spruce, is cut most extensively in Washington and Oregon. Western hemlock, which is obtained from the same region, suffers from the reputation of the eastern hemlock, but is far superior for structural purposes. On account of the prejudice against it, it is often sold under such names as Alaska pine and Washington pine, spruce or fir.

Recent tests by the Forest Service show longleaf pine to be the strongest and stiffest of all the timbers named, with Douglas fir a close second; while western hemlock, loblolly pine, tamarack and Norway pine follow in the order given. Fortunately, Douglas fir and western hemlock, of which there are comparatively large supplies, have high structural merit, as has also loblolly pine, the chief tree upon which the southern lumber companies are depending for future crops.

Much of the information hitherto available concerning the strength of timber has been secured from tests of small pieces without defects. This can not safely be assumed to hold good for large-sized timbers as found on the market, since these commonly contain such defects as checks, knots, cross grain, etc. The location of the defects varies the extent to which they lessen its strength; and the proportion of heart and sap wood, and the state of seasoning, must also be considered.

Circular 115 of the Forest Service, just issued, gives the results of tests that have been conducted during the past four years at timber-testing laboratories in different parts of the country. This circular will be mailed upon application to The Forester, Forest Service, Washington, D. C.

**The Century in 1908**

The increase of travel to Egypt will lend additional interest to the intrinsic attractiveness of a series of papers on “The Monuments of Egypt,” which will be contributed to *The Century* during 1908 by Robert Hichens, author of “The Garden of Allah,” and for which Mr. Jules Guérin has visited Egypt, to secure a series of beautiful drawings, largely in color. This combination of writer and artist will be recognized as an ideal one.
Two Attractive Residences

We are herewith showing an exceptionally large, very conveniently arranged house. All the elevations and floor plans are shown, in which the dimensions are given and the material used is indicated. The foundation is of stone, while the body of the house is of dark brick, the upper part of light brick and the roof of shingles. The porch is constructed of brick with stone trimmings. The basement plans show the interior arrangements, and in the foundation plan, the heating, sewerage and plumbing systems are clearly shown. It shows the furnace to be centrally located, thus doing away with long pipes with numerous curves, and thus produces a uniform heat throughout the house. The fresh air shaft is also indicated and the various pipes are all marked, showing what rooms they go to.

The first floor is divided into a dining room, parlor, sitting room and kitchen. The parlor and sitting room are divided by a large cased opening, making practically one large room. At one end of the sitting room is a hexagonal window seat, while at the side of the sitting room is a large fireplace, in front of which is a tile floor and on either side of which is a seat. This makes an ideal sitting room and it has all the conveniences to insure comfort and its connection with the parlor makes the two rooms practically one large living room. Another good feature is that the dining room and kitchen are entirely separate from the parlor and sitting room, being divided by a large hall. This is especially appreciated by the women, who prefer to arrange the dining room without disturbing those who may be assembled in the other rooms. The pantry is conveniently located between the kitchen and dining room.
We are showing two arrangements of the second floor, either of which can be used, but we thought it a good plan to show both, as the tastes of different people naturally differ, and we therefore offer two suggestions for the second floor arrangement. In the one there are three bedrooms and a sewing room, while in the other there are four bedrooms and a sewing room, the arrangement being practically the same with the exception of the front bed rooms and the slight change in the hall. The rooms are all equipped with closets and the one bed room has an open fireplace and a window seat, both of which tend to make it an exceptionally attractive room.

**Story and a Half Bungalow**

We are showing on page 350 a story and a half bungalow, planned and built by E. J. Buss, of Genoa, Ill. It is a style of a house that is not often found in that part of the United States, but it is very attrac-
tive and very conveniently arranged. The house stands broad side to the street and is 28 by 38 feet in size. It is shingled from the sill up with jointed red wood shingles, which are stained brown medium moss green, shingled roof and white trim.

The first floor is divided into a sitting room, dining room, parlor, kitchen, bed room and a bath room. The second floor is divided into three bed rooms and a store room. This is an exceptionally attractive house, when the cost of the same is considered, it being $1,900 exclusive of the lot.
Material Used in San Francisco Reconstruction
(Continued from page 343)

It looks now as though the steel skeleton with brick filling were to be the order of the day in the rebuilding movement from now on.

But more striking than almost any other architectural feature of the rebuilding movement in San Francisco is the use of face brick, and other classes of frontal veneering.

The face brick are almost exclusively of the lighter shades, the red pressed brick in fronts being conspicuous by their absence. The consequence will be that the new San Francisco will be a very bright, beautiful and cheerful town. If the use of light colored face brick is kept up at the rate that marks the reconstruction movement at present there will be very few somber spots in the city.

Besides these bright colored brick, much marble, granite, light colored sand stone, white tiling, white enameled brick, terra cotta and stucco are being used.

A granite-white sand and lime face brick is being largely used, as well as pressed brick of cream, yellow, buff, gray, drab, cream and brown mottled, etc. The combinations are very tasteful and artistic.

Strange to say, Chinatown, of which there was some talk of abolishing during the early days of the reconstruction period, has been more solidly built up than any other part of the city. It has been done very large of brick too, and in a generally tasteful and substantial manner. The prevailing style of architecture in this location is oriental, giving Chinatown a unique and attractive character.

At the corner of Sacramento and Dupont streets, in the heart of Chinatown, is a three-story building recently completed and now occupied by the Nakhing Fook Woh Company as an oriental store with Chinese goods for sale. This structure, which is shown in one of our illustrations, was built of Golden Gate sandstone brick, an almost white lime and sand brick, while the woodwork is painted bright red and green, making the building decidedly oriental in color contrast as well as in architectural style.

Three floors of this building have plate glass fronts, in order to give a display of the unique goods carried by the company that will be visible from the outside.

The manufacture of sand and lime brick has connected with it quite an interesting history. It was first used in Holland many centuries ago and was used in the construction of the dykes. Then some German inventor improved the process of manufacture and it became known as a German product.

It is used very extensively in Europe. The city of Berlin uses about 3,000,000 of the brick annually, while England is a liberal user of the brand. The sand and lime brick has been in use now in the United States for about seven years, and in California about four years.

It is formed of a chemical bond of pure sand and lime. It requires a sharp sand and a good grade of lime. The lime is pulverized and then mixed with the sand while both are in the dry state.
Then the mixture is moistened and goes into a press, and each brick is submitted to a pressure of 175 tons. The brick, as they come from the press, are placed upon iron cars and run into a big steam cylinder, where they receive live steam for ten or fifteen hours. They are taken out of the cylinder and then are ready for use.

This make of brick is being used in the construction of outside chimneys, porch arches, and other ornamental work in artistic residence construction in California. We give an illustration of an eight room cottage constructed by G. H. Field at Antioch, Cal. The first story is covered with rustic lap siding and the attic story is shingled.
School Buildings for Present and Future Needs

COMPLETE PLANS AND ELEVATIONS SHOWING DIMENSIONS AND ARRANGEMENT—SPECIAL FEATURES POINTED OUT

THE planning of the school house is a branch of architectural work that taxes the ingenuity of the architect to get the best results in the several parts that go to make the ideal school building. Such as in the heating and ventilation of all parts, the proper and adequate sanitary arrangements, lighting, etc., besides the general arrangement for convenience and comfort for the pupils, as well as for those in charge. Especially is this true when only one-half of the building is to be erected, leaving the other half for some future time when the demands of the district will afford the entire completion of the building as originally planned. To make the first half a model in arrangement, both in interior and exterior, so that the whole building when completed will show up all right from an architectural stand point, is the part that requires especial consideration from the first. The accompanying photograph, together with the several floor plans, elevations, sectional drawings, shows such a building which was planned by G. W. Ashby. The other half of the building will be similar in arrangement and by a very little change in the first, which consists mainly in the taking out of the wall at the central part, will make a continuous hall running through the building, and by connecting the roofs will make the building appear as if the whole had been erected at the same time.

+ Advertising Pays

Jones lost his umbrella in church, and offered a reward for its return, but it did not materialize.
"Your copy is wrong," said his friend Knowit. "Let me write you an 'ad.'" Jones assented, and in the Saturday edition of the Oak Leaves the following notice appeared, under Jones' name and address: "Party who was seen taking an umbrella from the vestibule of Grace church must return it, to avoid trouble, as he is known." When Jones returned home that night he found twenty umbrellas awaiting him. This proves—well, what does it prove, Mr. Advertiser?
Simply a Wager

An Irishman, wishing to take a "homestead," and not knowing just how to go about it, sought information from a friend.

"Mike," he said, "you've taken a homestead, an' I thought maybe ye could tell me th' law concerning how to go about it."

"Well, Dennis, I don't remember th' exact wordin' uv th' law, but I can give ye th' m'amin' uv it. Th' m'amin' uv it is this: Th' government is willin' t' bet ye 100 acres uv land against $14 that ye can't live on it five years widout starvin' to death."

Train Time

A Kansas editor, since the ruling of the interstate commission cut off his pass, has dropped the timetable from his paper and prints this line: "Trains are due when you see the smoke!"
NOW that winter is at hand, the average painter begins to have an anxious expression, for he is looking forward to three months of practical idleness, save for an occasional job of inside work or paper hanging. The average property owner, and not a few painters as well, have an idea that paint is injured by frost, but this is far from being the case if the paint is thinned only with pure linseed oil and turpentine and the necessary quantity of dryers. As the freezing point of linseed oil is eighteen degrees below zero it is not to be supposed that the ordinary winter weather would cause any damage to freshly applied paint, since it is not at all likely that any painters would be willing or able to do any outside painting work when the temperature is sufficiently low to freeze the oil and cause injury to the paint film. The only effect of cold, dry weather is to reduce the rapidity with which the paint dries, and for this reason a somewhat larger proportion of the best liquid dryers should be added than would be needed for work done in warm weather. It is well, also, to use a larger proportion of turpentine, in order to render the paint somewhat more fluid and to apply the paint somewhat thinner than usual, and to use plenty of elbow grease in brushing it out. Certain precautions must always be observed, however, in winter painting, if the painter wishes to insure a successful job. One of these is to be very careful that the surface to which the paint is to be applied is perfectly dry and absolutely free from small particles of ice or frost. During winter nights, whatever moisture may be contained in the air is very apt to be deposited upon the surface of the weatherboards, freezing there to form a very thin film of ice or frost, often so light as to be almost imperceptible. But this ice film will be sufficient to prevent adhesion of the paint to the wood. After the sun has been up for some time, this coating of frost gradually disappears, being absorbed by the atmosphere, whose capacity for holding moisture is increased as the temperature rises. Even a few degrees makes a very considerable difference. The painter should therefore wait until all trace of frost or moisture has disappeared, even though he may not be able to begin work before nine or ten o'clock. And he should stop work as soon as the sun gets so far down in the west as to cause the frost again to deposit on the surface. Even though he can only work from ten in the morning till four in the afternoon, a half a loaf is a good deal better than no bread, and it is a good deal more satisfactory to be able to work half a day than to have no work at all. With the precautions mentioned, winter painting is fully as durable as painting done at any other season of the year. Moreover, there is no dust nor insects to cause damage to the fresh paint. The writer has seen weatherboards taken from a house that were painted with the thermometer in the neighborhood of zero, yet on which the paint at the end of seventeen years was in such good condition, that were it not for the fact that alterations were being made to the house, no painting would have been necessary for two or three years. One word of caution had best be given, and that is to avoid paints containing any considerable percentage of water, when winter painting is being done. Some of the mixed paints now on the market contain anywhere from five to fifteen or twenty per cent of water in the thinners, and while this water may not be detrimental when the paint is employed at the ordinary temperature—and from the good results obtained with some of these paints we can readily believe that the water may be harmless under such circumstances—there might be danger that this water would freeze, when painting is done in winter, causing the paint to disintegrate rapidly.

Painting the Tin Roof

At this season of the year the tin roof should be carefully looked into. It is a very wise old saw that “an ounce of prevention is worth a pound of cure,” and it costs a good deal less to have the roof painted and any leaks stopped before the snow renders it impossible, than to repair plastered ceilings and repaper walls damaged by leaky roofs. A tin roof should always be thoroughly painted on the under side—preferably with two coats, though it seldom gets more than one, and a scant one at that—before the tin is laid on the roof. It is surprising what a large quantity of moisture from condensation will collect on the under surface of the tin roof, and this will sooner or later start rust, and once the rust begins, it will go on increasing until the roof is riddled with holes.
As the sheets of tin are dipped in palm oil after they have been coated with the mixture of lead and tin, into which the iron plates are dipped to produce the roofing plate, and as this palm oil film is repellant to paint, many roofers and painters have advocated allowing the tin to stand until it begins to rust a little, in order to give the paint a good hold. But while the paint may cling better to a rusted tin roof, it will not prevent the rust from growing underneath the paint. Once let rust start and it acts as its own oxidizing agent, and spreads underneath any protective coating that may be applied over it. The only object of coating the sheet iron plates with the mixture of lead and tin is to protect them from rust, and it is certainly worse than folly to permit them to rust in order to make the paint hold. The proper plan is to carefully and thoroughly wash the tin with benzine, as soon as the roof has been covered. This will remove not only the traces of palm oil that have been left on the surface of the metal, but the resin and soldering fluid which has been left by the tanners in making the joints. Moreover, as the benzine evaporates completely, it will leave no trace upon the surface of the tin roof, which can be painted upon as soon as it is dry.

Experience has proved that white lead does not make a good priming paint for tin roofs or for iron work. Being composed of the hydrate as well as the carbonate of lead, it contains within itself rust producing agencies. Red lead is recommended by some, but is difficult to apply. To be properly used it should be brought to the job dry, mixed with linseed oil on the spot, and the painting should be done as soon as it is mixed. The great weight of red lead causes it to settle in the pot, and unless it is kept constantly stirred and the painter is more than usually careful, the paint film will be very uneven; thick in some places, while in other places it is little more than a colored wash. A tin roof, moreover, is exposed to great variations of temperature and whatever paint is used should be sufficiently elastic to withstand the expansion and contraction that is constantly taking place. The experience of painters generally is that the best paints for a tin roof are Venetian red, mineral brown and graphite and that the oil should be boiled linseed oil, or half boiled and half raw oil, or raw linseed oil with a sufficient percentage of fish oil to make the paint film elastic. By boiled oil, we mean genuine kettle boiled linseed oil, and not raw oil doped with so large a proportion of liquid dryers that its life will be speedily burned out of it. Boiled oil dries rapidly on the surface, while underneath it always remains more or less tacky. This property is very detrimental to ordinary paint, and boiled oil should usually be avoided on account of its tendency to alligator and blister. But on a tin roof, this tackiness is an advantage because the paint film is better able to expand and contract with the metal.

In choosing the pigment be very careful to avoid the cheap metallic paints made from the spent pyrites from sulphuric acid works or the refuse from iron furnaces where certain low grade ores containing sulphur are worked. These paints contain more or less free sulphurous acid, and while they may be good enough for painting barns or box cars, where the sulphur will work no harm, they may and probably will cause a great deal of damage to the tin roof, because every rain will cause some of the sulphurous acid to turn to sulphuric acid, which will soon eat holes in the roof. Many instances are on record of tin roofs that have been eaten through in less than a year by these low-grade metallic paints. The safest iron oxide paint to use (other than the expensive Venetian red) is the well-known Prince's mineral brown. This is made from an iron ore that is remarkably free from sulphur, and which is roasted to drive off any combined water. Excellent results can also be obtained by the use of a first-class graphite paint, where the color of this material is not objectionable.

**Treatment of Floors**

How shall the floor in the ordinary house be treated, so that rugs may be used, yet so that all unnecessary expense may be avoided? There are a great many houses where the expense would render hardwood floors out of the question. Sometimes it is a rented house. The owner is unwilling to lay hardwood floors, or even to paint or varnish the floors, yet the tenant wants to use rugs, or perhaps bare floors. Although great claims are made by varnish manufacturers for their floor varnishes, it may be truthfully said that none of them will stand the hard usage of walking on them without sooner or later marring white. As was very pertinently said by a varnish manufacturer, speaking of the subject of varnished floors at a master painters' convention, "floor varnishes are not meant to be walked on." They are intended, rather, to keep the wood clean and so that it will look nicely, round the edges of the rugs, which should be laid on the floor wherever people may be expected to walk. But the average householder does not take this view of the subject. A floor is meant to walk upon, rug or no rug. What can be done?

First, of all the cracks must be filled, either with putty or one of the special crack fillers that are made for the purpose of filling in the spaces between shrunken boards, or making good surface defects in the wood. These fillers are made by a number of different manufacturers and all of them are good enough to answer the purpose. For those who desire to make their own crack filler, we will give two or three recipes.

For large cracks, an excellent unshrinkable filler or putty is made by soaking blotting paper in boiling water until it becomes converted into a pulp, which is then mixed with glue, also dissolved in water. Enough bolted whiting is kneaded into this pulpy mass to make a fairly stiff putty, which may be tinted with color so as to match the wood. It should be
pressed well into the cracks and smoothed off with the putty knife.

For small cracks, one part of white lead in oil should be mixed with two or three parts of bolted whitening and enough coach varnish added to form a stiff paste. For hurried work, coach japan may be used in place of coach varnish. This putty will resist moisture, and when dry may be sandpapered or rubbed.

Another putty or crack filler for floors that is said to be exceedingly waterproof is made by mixing five parts, by measure, of cottage cheese and one part, by measure, of unslaked lime, kneaded together to a stiff dough. This putty will become stone hard. By the addition of mineral colors, such as burnt or raw sienna, burnt or raw umber, Vandyke brown, Venetian red, mineral brown, Venetian or Indian red, this putty can be colored to any desired shade.

Where the floor is pretty good, the simplest and best treatment, if one will take care of it after it is finished, is to first give the wood a coat of good silex paste filler, if it is open grained hardwood. This should be applied along a strip say two or three boards wide, with a short heavy brush. The finisher should then go back to the starting point and rub the filler well into the wood, across the grain, with burlap, and should carefully wipe off, in the direction of the grain, any surplus filler, using a soft rag. After the filler has had time to thoroughly harden, say, in from twenty-four to forty-eight hours, one or two thin coats of shellac should be applied, and after this a thin film of floor wax, which is brought to a polish with a weighted brush. Care must be taken not to use more than just enough wax to give the requisite polish. As the floor wax begins to wear through a little more wax may be applied to the worn spots. The floor should be polished at least once a week with a weighted brush. On no account should varnish or linseed oil ever be used over a wax finish, as it will soften it up and make a sticky mess, which will never dry and must be completely removed. When a wax finish becomes dirty through wear, it can be readily removed with turpentine. This is better applied hot, and to avoid any danger from fire, the can containing the turpentine should simply be set in a pan of boiling water, which should be stood on several thicknesses of newspaper to protect the floor under it from the heat.

In the case of close grained woods the paste filler is unnecessary. First give the floor a coat of linseed oil, using about one quart of turpentine and from one-half pint to one pint of best liquid dryers to the gallon of oil. Rub this oil well into the wood, and next day it will be ready for the shellac. This darkens the wood a little, but it is almost impossible to do a good job of shellacking on bare boards. Right here, let me say one word of caution. There is so much adulterated shellac on the market that is dear at any price, that it is economy to buy only from a responsible firm and to pay a good price to get a pure shellac cut with denatured alcohol.

Instead of using wax, the floor may be kept in good condition by giving it repeated coats of a non-drying mineral oil—one of the so-called polishing oils or floor oils. This should be well rubbed into the floor and wiped off with a dry rag so as to leave no surplus oil on the surface. A hard pine floor may be brought up this way from the beginning, using neither filler nor shellac. It can readily be kept in condition by the housewife, wiping up the floor say once a week with a rag barely moistened with the oil and rubbing it with a dry rag. Some of these floor oils contain a very little wax, which may be of some advantage.

About four and a half years ago, the writer rented a suburban house, the floors of which were of spruce and in very poor condition. As we desired to use rugs, and at the same time did not care to spend any more than was absolutely necessary, I took a good brand of liquid filler made with a pigment base (manufactured by a good firm) and stained it with burnt umber and a little burnt sienna, to get the desired shade. After this had dried for two days, a coat of floor varnish was given, and since that time the floors have been regularly treated with polishing oil every week or ten days, as just described. They in perfect condition today and my neighbors have frequently asked how we are able to keep them in such good condition, in spite of the fact that the children are constantly running over them. And in this connection it may be stated that while the remark previously made is true, that any floor varnish will, in time, mar white, under ordinary conditions, nevertheless, a varnished floor may be kept in good condition indefinitely, if it is regularly oiled.

Some people recommend the use of boiled linseed oil and dryers for keeping floors in condition. While it is true that good results may be obtained by using this treatment on the bare wood, or over varnish, and continuing it regularly, there is a danger connected with it that cannot be too strongly emphasized. This mixture is a very powerful oxidizing agent, and if a bunch of cotton waste or of cotton rags, that has been soaked in it, for the purpose of oiling the floor, should be carelessly thrown into a closet or left in a corner, spontaneous combustion will almost inevitably follow within a few hours. The only safe plan to pursue is to burn this waste or rags as soon as you are done using them. Many an unexplained fire has resulted from carelessness on the part of servants neglecting this simple precaution. It is far better to avoid the risk by using the non-drying mineral oil rather than the boiled linseed oil.

The October number really was a dandy, there's no mistake about it. I am positive the American Carpenter and Builder is the best that can be obtained for the price. Michael F. Damon, Birchwood, Wis.
Southern Cow Barn

DESIGNED FOR WARM CLIMATE—CEMENT AND IRON PIPES COMPRISE PRINCIPAL MATERIAL USED IN CONSTRUCTION—ADVANTAGES OF SAME

The cow barn herewith illustrated is designed for a warm climate and with the view of obtaining good results as an investment. All rules of architectural proportion and design, as far as looks are concerned, have been laid aside. The barn being located at a place where good returns are required and no architectural beauty called for, it is a success because it meets all its requirements.

The walls of the basement or stock room are built of cement blocks and the entire floor surface being of cement will keep the room cool in warm weather. The second floor, or hay room, is of wood construction and covered by a flat roof.

There are two rows of cow stalls; the cows facing each other, and between them is a hay rack built of one inch wrought iron pipes set six inches apart, the bottom of the pipes being bedded in the concrete floor and the top of the pipes run into a wood rail. This feed rack, extending about three feet above the hay floor, makes it convenient for filling and at the same time giving it additional capacity so that it will hold several days’ feed. At the foot of each side of this feed rack there is a feeding trough formed into the cement floor for feeding other foods and watering. This is a very good arrangement, not only for its compactness, but as all hay that is dropped by the cows falls into the trough and is afterwards picked up by the cow in place of being trampled on and wasted.

The cows are separated by iron pipe railings which are bedded in the cement floor and fastened to the hay rack.

As will be noticed in the cut, the cows are fastened with chains which are fastened to a ring placed around a vertical pipe each side of the stall.

The stall floors have a gradual slope to a shallow gutter at the rear of the stalls and this gutter has a gradual slope to a drain tile to carry out all liquids to a cistern under the compost pits at the end of the barn. Calf stalls and loose stalls for dry stock and
barn are arranged about the outside walls, and these are also constructed of wrought iron pipe, so that there is practically no wood work about the stalls or floors which can not rot or get mouldy.

This makes an ideal barn for its purpose and can be constructed at a reasonable price, and is practical for southern states where hay is the principal feed. For feeding silage this would not be so practical, as it would be too inconvenient to place the silage into the feed trough, unless the cows were first taken out of their stalls. Again it would not be well for a northern climate where the barn is constantly guarded against cold weather and a perfect system of ventilation and fresh air inlets are very necessary.

He Set a Date

A merchant in a Wisconsin town who had a Swedish clerk sent him out to do some collecting. When he returned from an unsuccessful trip he reported:

"Yim Yonson say he vill pay ven he sells his hogs. Yim Olesen, he vill pay ven he sell him wheat, and Bill Pack say he vill pay in January."

"Well," said the boss, "that's the first time Bill ever set a date to pay. Did he really say he would pay in January?"

"Vell, aye tank so," said the clerk. "He say it ban a dam cold day ven you get that money. I tank that ban in Yanuary."—Harper's Weekly.
MORRIS chairs have proven so popular that a rocking chair built on the same roomy plan is offered this month. The chair, a picture of which is shown, was built by Mr. Earl Rhodes after a design in "Problems in Furniture Making," the drawing of which is reproduced by kind permission of the author and the publishers. This is not an easy problem and only those boys of experience and considerable skill are advised to undertake it.

Only the best grade of thoroughly seasoned white oak should be used. It may be quarter-sawed or plain, just as the worker desires. Quartered oak for the arms and the other flat pieces will look very pretty when finished.

To save unnecessary labor, it is suggested that the stock be ordered mill planed as far as possible. For the front rail, one piece 7/8 by 4 1/2 inches by 2 feet 2 1/2 inches; for the side rails, two pieces of the same thickness and width with a length of 24 1/2 inches. These pieces might be ordered surfaced on four sides to 3/8 of an inch and got as one piece, the lengths being combined.

For the arms, two pieces 1 1/4 inches by 5 1/4 inches by 2 feet 6 inches. Combine the lengths and have the piece mill-planed on two surfaces to 1 1/4 inches.

For the back, one piece 7/8 by 4 by 21 inches, S-4-S., one piece 1 1/4 by 4 1/2 by 21 inches, S-4-S. For slats to form the seat five pieces, 3/8 by 2 1/2 by 25 inches. These lengths may be added in ordering and the stock got S-4-S to 3/8 of an inch by 2 1/2 inches.

There will be needed two strips 3 1/8 by 3 5/8 inches to fasten the slats of the seat to, one should be 20 inches, the other 25 inches long. Should it be desired to put in springs instead of slats the slats should not be included in the stock bill of course. For the rockers, two pieces 1 1/2 inches deep throughout, by 2 1/2 inches wide throughout, with a length of 3 feet 2 inches from end to end, S-4-S. The radius of curvature is to be 3 feet 4 1/2 inches.

For the posts, two pieces 2 1/4 by 2 1/2 by 20 1/2 inches, S-4-S. Combine the lengths. The back posts may as well be ordered cut to shape. There will be two pieces each 2 1/2 inches across the front extending the entire length of the piece. The depth of the post is 2 1/4 inches, extending to a distance of 1 foot from the lower end of the post. From this point the post tapers to a depth of 1 inch at the top. The amount of slant given to the upper part of the back posts may be obtained by extending the front line, Fig. 2, then measuring from this, at the top end, 3 1/4 inches.

If the legs are to be sawed out by hand, get a piece 2 1/4 by 7 1/8 or 8 inches by 36 inches. By properly laying out the pieces so that the angles of one shall fit the angles of the other both may be got from this piece.

Work may be begun on the front posts first. If the wood is well seasoned and properly mill-planed, the smooth plane may be set very shallow and the posts be planed just enough to remove the marks of the plane knives.

To lay out these posts, begin at the top ends, which are supposed to have been cut fairly accurate when first got out. Turn the 2 1/2 inch faces up, even the top ends with a try-square and measure off consecutively 3 1/4 of an inch, 10 1/2 inches, 3 1/2 inches, and 5 inches, leaving 3/4 of an inch more for the tenon which enters the rocker. Square light, sharp pencil lines...
across both pieces at these points. Next separate them and square these lines on the other marked faces of each piece.

Set the gauge to 1 3/4 inches and gauge from the marked faces, between the marks which are 3 1/2 inches apart on each marked face of each post. Now set the gauge to 1 1/2 inches, Fig. 2, and repeat.

All mortises in the posts are to be chiseled to a depth of 1 3/4 inches.

The tenons on the lower ends of the posts would best be laid out and cut after the frame has been put together.

One set of mortises on the back posts can be similarly laid out. Place the pieces side by side with the front face surfaces up and even the top ends. Measure from the top 2 feet 4 1/2 inches, 3 1/2 inches, then 3 1/2 inches again. Square sharp pencil lines across both pieces at these points and gauge from the inside face edges as was done on the forward posts, Fig. 2.

The mortises which are to be put on the sides of the back posts must be laid out at an angle with reference to the edge. The one at the top is to be 3/4 of an inch by 3 inches, placed so that its top shall be 1 3/4 inches below the top of the post. The lower mortise is to be placed on a level with the one previously laid out on the forward surface. It should be 3/4 by 3 1/2 inches. The proper angle at which to lay out these mortises can be got by laying a straight-edge along the leg from the middle of one mortise to the middle of the other, the sides of the mortises being laid off parallel to this line and the proper distance from it. They are to be cut to a depth of 1 3/4 inches.

The rails for the back may be tenoned and mortised, the slats cut and the back glued up next. The top rail is to be laid out to nineteen inches between the shoulders, leaving 1 inch at each end for tenons. Fig. 4 shows the settings of the gauge.

The lower rail is to be of the same length. Fig. 5 shows the settings of the gauge.

Before cutting the mortises for the slats in the rails, cut the five slats to length, 2 3/4 inches. This allows for a 3/4 inch tenon on each end. These tenons may be shouldered, as shown in Fig. 1, or the ends of the slats may simply be "housed" by making mortises just the size of the cross-section of the slats. The latter is easier and will look and be just as well, providing the mortising is accurately done.

To lay out these mortises, place the two rails in the
vise, even the shoulders and the edges. The under edge of the top rail and the top edge of the lower rail—the face edges—are to be placed up. Begin midway between the shoulders and lay off cross-lines for the five mortises so that there are inches apart—or whatever the slats measure in width—with 1 inch between and 1% inches between the last mortise and the shoulder of the end tenon. On the top rail the gauge should be set first to % then to ¥g of an inch in locating the sides of the mortise, Fig. 5. Cut these mortises 7-16 of an inch deep.

Clean up the parts thoroughly, and put the back in the clamps. Glue the ends of the slats but slightly. Make sure that the rails are square to the posts from face as well as edge.

Fig. 6 gives the layout of the front rail. The distance between shoulders is 2 feet % an inch. Cut the tenons, clean the pieces and glue up the two front posts to them, squaring carefully from face and edge before leaving.

The tenons and shoulders of the side rails must be cut on an angle, the sides of the mortises having been cut square to the surfaces. The T-bevel should be used to mark off this slope. Fig. 7 gives the layout.

Lay the side rail on the bench or place it in the vise with the joint-edge up, lay on the steel square so that the outer edge of the blade shall take the direction of the line A, Fig. 7, crossing the edge at the 22½ inch mark and the tongue the direction of the line B, crossing the edge at the 23½ inch mark. Mark along the tongue and also mark the edge at the 22½ inch mark to indicate the length.

The T-bevel may be set from these marks and the other edge marks put on with it. Locate the middle of these sloping lines and measure each way 3-16 of an inch to get the position of the sides of the tenon. Place the steel square in a position similar to that just used but with the blade on one of the tenon marks and the 23¼ inch mark of the tongue on the corresponding tenon mark at the other end. Mark along the blade. Similarly, all of the tenon sides may be laid out on the edges. The gauge may be used to lay out the rest, setting it to % inch and gauging from the point edge, then setting it to 4 inches, Fig. 7. Rip first, then cross cut to the shoulder lines.

The arms are to be 2 feet 5¾ inches long. They taper from 5 inches at the front to 4 inches near the back on a straight line, then by an easy curve to 2 inches. An off-set of 1 inch is made and the arm fitted to the back leg, after which the ends and corners are curved, as shown in Fig. 1.

The side rails should be cleaned, glued and clamped to the legs so that they may dry while the arms are being made.

The mortises on the under side of the arms are to be just the size of the tops of the front posts, and should be laid off from the inner edge of the arm with try-square and gauge.

After the tenons have been cut, the rockers may again be placed, and the location of the mortises marked by superposition. Fig. 3 gives the gauge settings for the tenons.

If slats are used for the seat, as shown in the Fig. 1, cleats must be screwed upon front and back rails to which they may be fastened. They should be set low enough to allow the slats to rest about % of an inch below the top edge of the rails.
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Building for the American School of Correspondence

The building recently erected for the American School of Correspondence, Chicago, is of particular interest from both the architectural and educational point of view. If it is true that a building reflects the character of its occupant it is easy to read the story of the American school, for this new home of home study is marked by solidity, dignity and usefulness. In its external, visible lines, it harmonizes perfectly with the practical purposes of its design and the dignity of its surroundings; and it is also a center which radiates invisible lines reaching to the very ends of the earth. For here are the headquarters of the largest institution in the world devoted exclusively to correspondence instruction along technical lines—a quiet but forceful factor in the distinctly modern machinery of education, whose enlisted army of ambitious workers answers its roll call from every quarter of the globe. The structure thus partakes to some extent of the nature of an office building as well as a school. Its design was, therefore, a complex problem dictated by several different considerations. First, of course, was its intended use as a school and a center of administration; but a factor of almost equal weight was its location. It stands in the immediate vicinity of the magnificent Washington park and the Midway Plaisance of the World's Fair fame, now an essential link in Chicago's great boulevard system. "Thus it has the advantages of surroundings of great natural beauty and artificial adornment. And, in conjunction with the University of Chicago, whose administration offices stand only two blocks away, the school is itself destined to be as instrumental in making this the education center of the city, as it has been in making Chicago the center of correspondence instruction."

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An era when even the memories of the hideous ram-shackles today, so in evidence in our Towns and Cities, will sink into oblivion, for "ram-shackles" will be Unknown to the Concrete Age.

Today we are building our Bridges, Levees, Abutments, Sidewalks, Streets, Railway Ties, Car Floors, etc., Telegraph Poles, Foundations, and a Thousand Other Things beside Beautiful Homes, Giant Buildings, and the Like, all of Concrete. Truly King Portland is "Master of Destiny."

But the King, although a mighty liberal old fellow, feels that he is being imposed upon and he complains that the United States, our own free land, mind you, fed him over One Billion and a Quarter Million of Imported Cement in 1894, which did not reach him in any means as our own Domestic Product, and then to "Add Insult to Injury," he went hungry the same year to the tune of Eleven Million Barrels.

This year (1907) the King says that he is getting an increased dose of foreign stuff, and that his rations are running short at the rate of Sixteen Million Barrels for the year.

That the King may not be like "Old Mother Hubbard" there has been written in the Interest of His Larder a Book Entitled the "Span of Concrete."

It is a Beautiful Magazine, profusely Illustrated, many of the Photographs being in Three Colors, size of Page 9x12 inches, Cover tied with Silk Cord, and done in Four Tones.

If you are in Position to make an Investment, don't pass this article by, but write today for the Magazine, enclosing ten cents for part postage. You will learn from it the Safest, Surest Investment Producible Today.

An Investment backed by Actual and Tangible Assets, Equaled by few Securities and Exceeded by none.

An Investment affording the Largest Possible Revenue consistent with Absolute Safety.

Gold, Silver, Copper, Lead, Zinc, and Iron, enormous though their interests be, are today Subservient to the Major Interests of King Portland.

These are all Incontrovertible Statements, based upon Cold, Hard, Unchangeable Facts. "Industry" is Alive to the Issue. "Capital" is Awakening.

Be Prudent. Awaken yourself and let Your Capital Work for You in the Beginning. The Opportunity of Today will not Repeat itself.

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AND DO IT TODAY.
Whether you know it or not, you are always being weighed in the balance. Practical knowledge, more particularly specialized training, is the balance of power between success and failure.

Drawing is the language of the Carpenter, Builder and Architect. It is the best method for recording ideas and calculations and showing small details. A short inspection of an accurate, well-executed drawing will give a clearer idea of detail and better instruction for making and finishing than any amount of oral or written explanations. There is constantly a great demand for competent architectural, structural and mechanical draughtsmen. Many a young man in an architect’s or contractor’s office could step into a higher position immediately if he had sufficient training in these subjects. Many older men, including carpenters, contractors, and the architects themselves, have forgotten much of their early training or utterly failed to learn many vital, up-to-date points. This knowledge would be of immense help to them and it can easily be acquired by studying the

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from a given quantity of fuel, reduces the cost of installing furnaces, and makes failure almost impossible. For more information send a description of the floor plans and basement of your house to the address below and they will send you free valuable suggestions as to heating. Write for the booklet, “Advanced Methods of Warm-Air Heating,” to the United States Register Company (Ltd.), Battle Creek, Mich.

Look Up the Brandell

The indications are that a very large number of the new Brandell (self-locking mold) Cement Block Machines will be sold and shipped to various states and countries during the next few months. So many, in fact, that the manufacturers may not be able to deliver later orders promptly.

The Brandell possesses advantages not to be found in any other block machine on the market. The illustration herewith shows a side view of the machine after completion and delivery of block. The main advantage is that there is a saving of from 30 to 50 per cent of the labor required to prepare the machine ready to mold the next block. This is accomplished by the self-locking mold that works automatically and easily.

The Brandell makes the block face down, which insures a clear, sharp impression of the face and produces a most natural looking stone free from any defects. If intending to purchase a block machine or if interested in the best one on the market, write for complete information to the Brandell Concrete Block Machine Company, Madison and Dearborn streets, Chicago, Ill, U. S. A.

The Newest Wrecking Tool

Recently there has been a patent issued to Mr. J. L. Roberts that will fill a long felt want of every carpenter and builder in the United States. This patent covers a tool that is a combination of a ledger puller and a wrecking tool. Its scope of work is almost illimitable and its price puts it within the reach of everyone, even to the smallest builder, to whom it is not one whit less valuable than to the big contractor. For housewrecking purposes its cost can be saved many times over on one job, as it does not split the lumber and the time saved by its use is remarkable. On floors, matched or unmatched, of any thickness, this tool is unequalled. How much trouble have you had, Mr. Builder, in tearing off roof boards? This tool will make that work easy for you, and at the same time will do a clean and, owing to the great saving in time and lumber, a far cheaper job. How long does it take you to tear off the lath and plaster from a good sized room—say 15 by 18 feet? With the tool it can be all removed in thirty minutes. Testimonials received from users all agree that so far there has been nothing put on the market that is its equal. It is provided with a claw for pulling nails and the handle can be used as a prying bar. It is
AMERICAN CARPENTER AND BUILDER

Specify and Use

No-Tar Roofing

This Tells You How to Make Extra Dollars

WRITE for our Free Roof Book and let us tell you how to make a Specialty of putting on No-Tar Roofing and build up a good side line to your business as Carpenter and Builder. We'll tell you facts and figures—low prices for the finest kind of roofing—that will interest and pay you to know.

Investigate—find out about No-Tar Roofing.

"No-Tar" Roofing has a surface as hard as flint—it is flint. Can't catch fire from sparks or cinders. It's as flexible as rubber—and absolutely waterproof. It's tougher than leather. Costs less and lasts longer than shingles, iron or steel. Won't run in the hot sun. The building that has a "No-Tar" Roof protection will last longest.

Accepted by all Fire Insurance Companies, who charge 25 per cent less for insuring buildings protected by "No-Tar" Roofing than for buildings with shingle roofs.

FOR STORE BUIDLINGS AND FACTORIES—"No-Tar" Roofing is made in various weights, for all sorts of buildings. Nothing better or cheaper for siding houses, out-buildings, etc. All joints water tight. "No-Tar" Roofing keeps stock and poultry snug, safe and warm in coldest weather. Quick and easy to lay.

FOR HOUSES—"No-Tar" Roofing will add immensely to the appearance of your residence. Use it on your new house, or cover the old, leaky shingle roof with "No-Tar" Roofing and avoid disaster from water or fire. "No-Tar" Roofing is a non-conductor of heat or cold. Keeps your house warm in the winter and cool in the summer. Try it on your porch or kitchen.

FREE SAMPLES TO TEST—When we send you the Free Sample of "No-Tar" Roofing we will tell you ten ways to test it and prove its superiority to any other roofing.

FREE ROOF BOOK—Explains the whole roofing proposition. We send the book FREE postpaid, on request.

The Heppes Company
2993 Fillmore Street
Chicago - Illinois

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The past EIGHTEEN years by Builders, Contractors and ARCHITECTS

In over 1600 places in U.S.

N.Y. Stock Exchange - Chamber of Commerce Building - Yale Club
Reading Terminal - Pension Building - N.Y. Custom House, Etc.

Illustrated pamphlet on application

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THE LAWRENCE CEMENT CO. OF, PENNSYLVANIA, Philadelphia, Harrison Building

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ON OUR Colonial Brick Fireplaces

A Leading Architect Designed this Non-Smoking Fireplace
We have scores of other fireplace designs—some simple, some elaborate—that will suit if this does not appeal to your artistic sense—all designed by America’s leading architects, in conjunction with a practical fireplace builder who has devoted his life to the work of perfecting a fireplace that will not smoke. Our fireplaces leave nothing to be desired in point of true artistic beauty, practicability and honesty of construction. We can refer you to many men of wealth and position throughout the country who find solace and comfort in the warmth and cheer of our fireplaces. Being built of finest specially made brick, they should not be confused with the cheap wooden affairs so often seen in modern homes. We suggest tints and colors to harmonize with the room decorations. Can be placed in new or old homes.

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and other Material used in the buildings of the INTERSTATE FAIR and EXPOSITION of Kansas City, Mo., and bought by us

At Sheriff’s Sale
400,000 feet of Lumber
1000 Squares of best “Peerless Roofing”
in use only 60 days Guaranteed as good as new except nail-holes.
While this lot of Lumber lasts we will sell it in car lots at from $8.00 to $15.00 per thousand—the Roofing at $1.00 per square.

Get your orders in early and save half the regular price
We handle anything and everything used in building construction. . . . Send us your estimates. . . . Compare our prices. . . . Direct to consumer is our plan.

"THE SAVING IS IN SIGHT!"

Address Today! Now!
THE
House Wrecking Salvage & Lumber Co.
103 E. 20th Street :: :: KANSAS CITY, MO.

absolutely simple. There are no clogs or pins to loosen; in fact, it is made entirely in one piece of best malleable iron, and can be used by anyone, even to the lowest priced help. For tearing apart concrete forms and such work, this tool is par excellence.

A very low price of $4.75 has been placed on this, the newest of wrecking tools, bringing it within the reach of all. If you are interested, drop a line to Mr. Geo. O. Gardner, 32 North street, New Bedford, Mass., and get further particulars.

A New Scaffold Bracket
The Taylor Steel Scaffold Bracket is intended to replace the old style wood bracket, which most builders have made themselves. It is stronger than the wood bracket, takes up less room, does not wear out or get broken, and in fact is virtually good for a life time. It is made in two sizes, 48 inch and 60 inch, from 1½ by 1½ and 1½ by 1½ rolled angle steel. The brace, in addition to being riveted, is notched into the top and side angles, making a very rigid and strong construction.

The bracket is secured in place by a special form of bolt, having a hook-shaped end. This bolt can be inserted or withdrawn through a one inch hole in sheathing, and no holes are bored through the studding, as the bolt hooks around the studding instead of going through it. It will also hook directly against the sheathing if it is desired to plaster inside building before scaffold is taken down. In shingling the sides of an old house over clap boards the scaffolds can be put up by simply boring one inch holes through the clap boards for insertion of the hook.

These brackets are being sold direct from the factory to the builder in lots of one dozen and upward, freight paid anywhere in the United States. The 48 inch size lists at $15 per dozen, and the 60 inch size at $18 per dozen, plus freight.

Structural Slate
The Lehigh Structural Slate Manufacturing Company is located at Slateadle, Pa., in the very heart of the enormous slate quarries of that region. The mill was erected this year and has been in full operation since July. The president of the company is Thos. Bolger, the proprietor and manager of the Woodley Slate Mill and Quarry, at Bangor, Pa. Mr. Bolger is one of the oldest and best-known mill managers in the trade. Realizing that this section of the Pennsylvania slate belt offered exceptional advantages for obtaining clear black slate for milling purposes, he, in connection with A. L. Rice and other large quarry operators at Slateadle, organized the above named company.

Structural slate comprises in the main the following articles: Steps, risers, platforms, shower baths, urinals, kitchen sinks, laundry tubs, chemical table tops and tanks, electrical slate for switch boards, switch bases, panel boards, billiard tops.

Clear black slate, free from ribbons, is largely in favor.
We make the engravings for this paper

1. We want to make your drawings and engravings.
2. We are specialists in this line and can not only give you better work but can save you worry and time.

Our Printing Department
Specializes on high class catalogs and booklets.

Our Advertising Department
Compiles and edits catalogs and writes copy for all kinds of advertising.

We Handle Mail Orders
as accurately as though we took the order from you at your desk.

A letter will put you on our mailing list.

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Saves time and money in glazing. Glass can be set from the outside and reset without disturbing window display or removing the window enclosure.

Endorsed by Plate Glass Insurance Companies because of its many practical advantages. Made in all finishes, but our new book—

"METAL STORE FRONTS"
tells all about it—gives interesting facts and full size illustrations. Write for a copy.

Detroit Show Case Co., 491 West Fort Street, Detroit, Mich.

“NICE” LIQUID WOOD FILLER
THE RECOGNIZED STANDARD SURFACER

It dries flat, works freely, does not show laps and requires little, if any, sandpapering. Light shade is perfectly transparent and will not mar the color of the lightest woods. It enables the finisher every time to make a high-class job with two coats, one of “Nice” Filler and one of Varnish or Hard Oil. It makes the very best flat stain by simply adding color in oil to suit. It has remarkable covering capacity (800 square feet to gallon) and is the most durable coating known for natural woods.

Will you let us send you our booklet “Natural Wood Finishing,” just off the press? It’s worth having and will only cost you a postal.

EUGENE E. NICE, Vernister and exterior painting and finishes
272-274 S. 2d St., Philadelphia

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among the leading architects. Only where the big beds are quarried can this stock be obtained, and for this reason the mill was located at this point. The Lehigh Structural Slate Manufacturing Company can turn out large slabs at short notice.

Cement and Its Future

We wonder if the many of our readers who are using cement realize that it is not a new material, that is not a product of the present century? As a matter of fact the Romans, the Greeks, the Egyptians, and the Chaldeans knew how to make Portland cement ages ago, and the granite blocks of their crumbling ruins are still held in place by Portland cement. The art, however, was entirely lost until the year 1824, when it was rediscovered by one Joseph Aspdin, of Leeds, England, and it was named Portland cement on account of the similarity in color to the products of the Portland quarries on an island to the south of England.

Very little was done in the manufacture of Portland cement for a number of years; in fact, its innumerable and invaluable properties hardly gained recognition until 1900, and very shortly afterwards, Edison and a number of other men of great foresight and inventive genius predicted the use of concrete for the construction of buildings of every character, from the cottage of the day laborer to the place of the millionaire, from the pavement of our streets to the sky scrapers of our great cities.

These predictions have been realized an hundred fold, and thus Portland cement has come to be known as the one age-proof, fire-proof, water-proof and cyclone-proof element of construction, and today, not a single building, nor a levee, nor a bridge is constructed into which Portland cement does not enter as a prime factor.

So wonderful and successful has been the development of its uses that it is destined to supplant wood and steel almost entirely. Verily, this is the dawn of the concrete age, and its present uses are but stepping stones by which the infant industry will approach, but cannot reach the zenith of its career for years to come, so countess be its additional applications.

In 1880 there was consumed 239,000 barrels, ten years later the consumption was 2,275,000 barrels, 1900 or just a decade later the proportions assumed the grand total of 10,868,703 barrels and the estimated report for 1907 is 70,000,-000, and yet with this enormous and phenomenal increase in the production of Portland cement in 1906, although the United States imported nearly 2,000,000,000 pounds, the demand was not supplied by over 11,000,000 barrels, while the shortage for 1907 is estimated at 16,000,000 barrels.

Lumber is a commodity the price of which is soaring beyond the reach of the average mortal, and while it is no doubt true that its price is regulated by the so-called trust, the real reason is that the demand is greater than the supply; cotton is on the way to 15 cents; diamonds are advancing at the rate of 20 per cent a year, and so is the case with other products and commodities, and the true reason in all cases is the law of supply and demand. What, then, will be the possibilities with cement now at an average price of $1.75 per barrel and almost 20,000,000 barrels short, and this too, in the face of the infant industry?

To the average layman such a proposition appeals immediately as an opportunity for investment—a look into the future—what then must our readers think, who come in daily contact with concrete problems—cement, cement blocks, cement buildings, bridges and other enterprises and necessities? You know its future from a technical standpoint, the same as Edison from an inventive point of view, and the same as hundreds who have already become interested from an investment standpoint.

What would you think of an opportunity to become inter-

"THE WINDOW CHUTE"

A WINDOW AND A COAL CHUTE

ALL IN ONE

Coal Chutes HAVE BECOME A MODERN CONVENIENCE without which no building is really "Up-to-date."

The Window Chute closes and locks automatically from the outside by simply raising steel bottom and pushing it over lugs provided at top. Has Cast-iron Frame and Hopper with continuous heavy Sheet Steel Bottom, which, when chute is open, completely covers and absolutely protects the Window Glass below it from breaking. Useful every day in the year for light or as a Chute. Saves the price of an extra window frame and sash, which would be necessary for light with any other Chute. The Window Chute is the only combination Chute and Window on the market, which feature is fully protected under United States patent law.

It Is Burglar Proof, for it cannot be opened except from the inside, by lifting sheet off of locking lugs. The Window Chute is made to last, and for practical utility and service has no equal. No more excuse for unsightly, soiled and blackened walls, battered frames and sash, littered walks and grass plats always found where coal and wood are put through a basement window. Equally suitable for frame, brick, stone or concrete walls, and for new or old buildings.

Standard Sizes

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Hopper Opening. | Outside Rim. |
22" 16 high | 28x19 |
32" 24 " | 35x27 |

Prices | Just Write |
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HOLLAND, MICH.

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EDW. MUEHLBROCK & CO., 400 N. Main St., St. Louis, Mo.

MANUFACTURED BY HOLLAND FURNACE CO.
Sackett Plaster Boards have been successfully used since 1891 in thousands of buildings of all classes, including small cottages, prominent hotels, costly residences, churches, and theatres.

Walls and ceilings of Sackett Plaster Boards will be dry and ready in half the time required when lath is used, as less than half the quantity of water is needed.

Less moisture means less damage from warped and twisted trim and woodwork.

Their superior insulating qualities make warmer houses with less fuel. The first cost is no more than good work on wood lath, and less than on metal lath.

Sackett Plaster Board is an efficient and economical fireproofing, not only for walls but between floors, and for protecting exposed wooden surfaces in mills, warehouses, and industrial structures. It is also used extensively instead of lumber as outside sheathing under weather boards.

Sackett Plaster Board comes in sheets or slabs 32 x 36 inches, ready to be nailed direct to the studding, furring, or beams.

For all kinds of buildings its use is ideal. It speeds construction; it lessens building cost; it reduces fixed charges for insurance; it makes fire-resisting walls and ceilings; and gives absolute satisfaction.

Carried in stock by up-to-date building-material dealers everywhere.

Booklet showing buildings all over the country where these Boards have been successfully used with Samples and name of nearest dealer, furnished on application to any of the following General Distributors

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SACKETT PLASTER BOARD CO.  
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GRAND RAPIDS PLASTER CO.  
GRAND RAPIDS, MICH.

Hotel Griswold, New London

4 Acres of Sackett Plaster Board used in its construction

R. W. Gibson, Architect

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ested in a cement property whose output will be 3,000 barrels per day, and whose location and facilities for production and manufacture and shipment are such as to bring the cost of manufacture down to 32 cents per barrel? But that is going into a subject which space will not permit our giving you the details. All we can say here is, that the British-American Portland Cement Company, whose general offices are in Kansas City (the plant is located at Nowata, I. T.) claim to have such a property, and will be pleased to send you facts and figures and court your thorough investigation.

Write to Major F. C. Vincent, financial agent, 1201 Dwight building, Kansas City, Mo., and he will answer you promptly with complete details and information.

A Great Catalog

One of the best arranged, most complete and handiest catalogues that has come to our notice is that just issued by the Rehm Hardware Company, 352 Blue Island avenue, Chicago. It contains over 1,000 articles of builders' hardware, tools and material used in building construction, including forty different designs in fifteen different finishes and much other valuable information pertaining to builders' hardware. The designs are the very latest and finishes the newest. One very valuable feature is that it gives net prices on all goods, illustrated so that figuring and estimating from it is a pleasure to the user. This catalogue should be in the hands of every subscriber to the AMERICAN CARPENTER AND BUILDER. It is sent free to those who ask for it. Address Rehm Hardware Company, 352 Blue Island avenue, Chicago.

Exposition Buildings Sold by the Sheriff

The recent legal complications and the appointment of a receiver for the Inter-State Fair & Exposition Company, at Kansas City, Mo., ended by the entire property being sold at sheriff's sale to the Housewrecking Salvage & Lumber Company, of that city. This property, consisting of buildings, out-houses, grand stands, sidewalks, fences, etc., is now being wrecked by the above firm and the materials are being offered for sale direct to the consumer at less than half the factory prices. This material, with the exception of nail holes, is guaranteed to be as good as new, and since it was only in use about sixty days our readers will readily appreciate its condition. To those who wish to save money, quick action is necessary as the prices quoted will cause ready sales for the entire lot in a short time.

The Housewrecking Salvage & Lumber Company handle building material of all kinds and solicit opportunities to quote money-saving estimates. See their advertisement on page 377.

Interchangeable Safety Clasps

Two years ago there was a patent issued to Thos. Vaughan, of Everett, Mass., which covers a clasp which is especially adapted for connecting glass in store fronts, show cases and for like purposes. On another page in this issue their advertisement shows cuts of this new invention. The principle of construction of these clasps is different from any others on the market, inasmuch as they are composed of separate members, each being interchangeable with the other. They are made from brass and heavily nickel plated, there being no iron to rust or corrode. They are constructed in such a way that in case there is a settlement in the building in which they are used the clasps will slide easily in each other, thus preventing possible breakage. A card or letter mentioning this paper addressed to Thos. Vaughan, Everett, Mass., will bring you a free sample and further information.

Heaters from Factory to Consumer

Any builder or owner desiring free heating plans (hot air furnace) or advice on furnace heating, is invited to address ROBERT'S

Ledger Puller and Wrecking Tool

A great Labor and Lumber Saving Tool for

Dismantling Staging
Tearing Down Concrete Forms
Wreaking Buildings

Will save its cost

On One Building
Tearing off roof-boards, sideboarding, lath and plaster and floors. For 2 inch stuff matched or unmatched

IT CAN'T BE BEAT

Geo. O. Gardner, Agent

FOR LEDGER WORK
this Tool will grip
ON TOP, UNDERNEATH or SIDEWAYS

Made of the very best MALLEABLE IRON in one piece, and it WILL NOT BREAK

There being No Clogs to break, no hinges or pins to loosen, it CANNOT GET OUT OF ORDER.

FOR Carpenters, Builders, House Wreckers and General Jobbers

This Tool is Invaluable

Geo. O. Gardner, Agent

$4.75

32 North Street
New Bedford, Mass.
刚刚出版

一本精选的书籍列表，适用于木匠、建筑工、承包商、建筑师、详细员、木工、钢铁、混凝土和水泥工、房屋业主、卫生、土木和结构工程师以及所有必须了解建筑施工的人。

每一本书都是一个完全的实用手册，你可以很容易理解。

木工。By Gilbert Townsend。160页，224图。适用于木匠和木工，特别是木工。不是一个理论性的，而是一个实际的操作指南。价格：$1.00

估算。By Edward Nichols。140页，35图。适用于所有建筑工。告诉你如何估价——由两年的实际测试证明符合所有要求。样本索要后发送。

合同和规范。By James C. Plant。130页，180图。政府和私人合同、规范、合同、责任和责任归建筑师、承包商和业主。价格：$1.00

楼梯建筑和钢尺。By Fred T. Hodgson and Morris Williams。130页，180图。适用于楼梯建筑和钢尺。价格：$1.00

材料强度。By Edward R. Maurer。150页，58图。适用于建筑师、土木和混凝土工。价格：$1.00

钢结构。By E. A. Tucker。320页，275图。适用于建筑师、桥梁建造师、承包商、土木工程师。价格：$1.50

建筑监督。By Edward Nichols。225页，250图。适用于建筑师和土木工。价格：$1.50

建筑和木工。By Bourne，von Holst and Brown。200页，140图。适用于建筑师和木工。价格：$1.50

机械画图。By Ervin Kenison。176页，140图。适用于所有建筑工。价格：$1.00

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立即行动。在今天。

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适用于商店前和展示柜

绝对防止破碎

在所有条件下

由两年的测试证明符合所有要求。样本索要后发送。

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EVERETT - - - - MASS.

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PLUMB AND LEVEL

一个最新的工具；可以方便地安装到水平仪器或直尺上。在你注意的某一时间，非常简单地调整，总是可以信赖的。用在所有金属、木工、瓷砖、木板、墙板等上。

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混凝土砌块机制造

HERCULES

《Hercules》是世界上最好的混凝土砌块机制造商。即使是最复杂、最精密的机器，也可以在6英尺长的范围内制造真正的混凝土砌块。这台机器坚固耐用，可以在关键时刻正确完成任务。

如果你没有看过《Hercules》目录，现在就去拿一本。我们会十分乐意邮寄给您。

如果你出席布法罗会议，请一定要看看《Hercules》制作的石头——真正的，永恒的石头。凡是这种石头，都比不上。
Classified Advertisements.

Advertisements under this heading will be inserted at the following rates:

- One month: 10 words $0.45 per line
- Three months: 10 words $0.42 per line
- One year: 10 words $0.45 per line

Count 10 words to the line. Situations wanted one-half above rates. Replies may be addressed in our care and will be promptly forwarded.

Help Wanted.

WANTED—Carpenters to read our ad on page 308. Gage Tool Co.

SOLICITOR WANTED to sell preferred stock in a Kansas Cement Plant now being erected. All stock guaranteed. We have a special plan by which we assist our agents in placing this stock. Monarch-Portland Cement Company, Barnes Building, Wichita, Kansas.


WANTED—Carpenters to read our ad on page 308. Gage Tool Co.

You cannot afford to be without Grinnell's Estimator and remembering that if not satisfactory your money will be refunded on receipt of book. Send $1 and be convinced, or addressed to Grinnell Pub. Co., Medina, N.Y.

LEARN CEMENT CONSTRUCTION in all its branches for $1.50. Building Blocks, Water Proof, white or any color. Bridges, Roofs, Floors, etc. Write for descriptive circular No. 30. Cement Institute, St. Louis, Mo.

Masons and Painters. Anyone of many of its pages is well worth the price of the whole. Send $1 and be convinced, remembering that if not satisfactory your money will be refunded on receipt of book. Address Grinnell Pub. Co., Medina, N.Y.

FOR SALE,—Hardware, Implements and Vehicle stock in a flourishing Kansas town. Profits about $60,000.00 per year. Will sell for a large bargain. Reason for selling, going into wholesale business. H. L. Gilbert, No. 412 Long Building, Kansas City, Mo.

Sco Georgia Marble

Cherokee

Etowah

SIDNEY, OHIO

THE GEORGIA MARBLE CO., - - TATE, GA.

"Creole"
"Etowah"
"Cherokee"
"Kennesaw"

"DEFIANCE" Wood Working Machinery

Band Saws and Swing Saws, Turning Lathe, Saw Tables, Joiners.

Write us for our 1907 catalogue.

The Sidney Tool Co.,
SINDEY, OHIO
U. S. A.

Georgia Marble

the Hess Warming & Ventilating Company, whose advertisement appears on page 315. This company has long made a specialty of selling direct from the factory, planning the arrangement of every equipment it sells, and has developed a large and growing business which embraces every state in the union. By offering free plans the company aims to prevent the many errors arising from ignorance and carelessness on the part of dealers and agents which, though applied to other makes of furnaces, hurt every furnace made, by creating discontent with furnace heating generally.

Incidentally, the Hess Company invites attention to the Loader Steel Furnace, and its complete heating equipment, which is sold at a price which cannot be met by midlemen. A free booklet fully describes the company's goods and plan of operating.

The Acme Floor Scraper

On another page of this issue appears the advertisement of the Acme Floor Scraper and Blade Sharpener. Although these machines have only recently been placed upon the market, the merits they possess and the labor they save is being recognized by carpenters and builders throughout the country. The inventor, Joseph Miotke, 250 Lake street, Milwauk-e, Wis., is a practical mechanic of long experience, and the knowledge he gained by years of tool manufacturing has enabled him to perfect these devices, the merits of which are better explained by the users of his machines than by ourselves, and we therefore reproduce a few letters taken at random from Mr. Miotke's files:

CHICAGO, October 29, 1907.—We purchased from you the representative one of your Acme Floor Scrapers and Blade Sharpeners, and find it is all he represented it to be, as to the work it does and the amount of labor it saves. Your machine is a big improvement on all others we have tried.

CAREKHEAD & MORAN Co., General Contractors.

MILWAUKEE, September 23, 1907.—Some time ago we purchased from you the Acme Floor Scraper, and we are pleased to inform you that we are entirely satisfied with the work it does and the amount of labor it saves. Your sharpening device is a strong addition to your scraper, for it overcomes the difficulty we have had in getting the right edge on the knife. With your device we can sharpen a knife in a very few minutes. Your machines should meet with great success, for they accomplish the purpose for which they are intended.

HOOD & TULLIGREN, Architects and Builders.

OSEKOSK, Wis., September 24, 1907.—The Acme Floor Scraper and Blade Sharpener purchased from you some weeks ago, have by this time paid for themselves in the saving of labor on the several floor scraping jobs I have had. Working with your floor scraper, my men say is a pleasure. They do not complain of lame backs, and learn to operate the machine after being shown once. I would not be without the outfit now that I have used it and know its worth to me.

JEROME MILLER, Contractor.

MILWAUKEE, August 30, 1907.—The Acme Floor Scraper purchased a short time ago, has proven entirely satisfactory, and the results obtained by using the same are all that you claim them to be. We are especially pleased with the sharpening device, for we can put the proper edge on the knife in a very few minutes. Your machines certainly fill a long felt want in the building line and are a great labor saver.

GENERAL CONSTRUCTION COMPANY.

Working on principles that are entirely automatic, the Acme Floor Scraper can be operated by anyone without previous experience, and one man can do as much and better work with it than four men can by using hand scrapers.

Realizing that no matter how good a floor scraper may be,
THE JONES SYSTEM
OF HEATING AND
VENTILATING

The Effectiveness of Many Heating Plants in
Homes, Stores, Churches and Schools is entirely
destroyed because of Improper Installation.

The Jones Registers and the Jones System of Installation
combine all the good points that make a perfect heating plant from every
standpoint.

It Will Pay You to Investigate This

Our booklet entitled "Advanced Methods of Warm Air Heating" is sent
FREE to those building new residences. Write To-day.

The United States Register Co., Ltd.
Head Office: Battle Creek, Mich. 104 2nd St. N., MINNEAPOLIS, MINN.

The Original Old Style Method
of making Terne Plates was known as the

MF

32 POUNDS COATING
PROCESS

because MF Roofing Tin was the first practical metal roof covering ever made. The process is just the
same to-day as it was then, and the plates are just as even in gauge, thoroughly coated and easily worked.
Therefore, when a property owner or roofer specifies MF Ternes, he can rest assured he is getting the best
to be had.
When ordering, keep in mind the fact that the MF Process is the oldest Old Style Process in existence,
and, that MF Roofing Tin cannot be excelled, regardless of how long you search. Write for our booklet
"From Underfoot to Overhead"—it is interesting and costs you nothing.

American Sheet & Tin Plate Company,
FRICK BUILDING, PITTSBURGH, PA.

WHIPPLE'S CARPENTER BENCH HOOK
The Handiest Little Tool Ever Manufactured

ARE QUICKLY ADJUSTED TO A TEMPORARY BENCH
EVERY CARPENTER SHOULD OWN ONE

Sent postpaid on receipt of price.

R. P. WHIPPLE & CO., 275 Main Street, SPRINGFIELD, MASS.
A Phonograph for Christmas

In selecting Christmas gifts it is always most satisfactory to get something which will give pleasure to your friends, and which will give enjoyment through all the year. What could be more appropriate than a handsome phonograph, with all the latest improvements, and capable of producing the finest music? The Duplex Phonograph Company, 298 Patterson street, Kalamazoo, Mich., are manufacturing one of the very best instruments on the market, which they sell direct to their customers, thus saving them all dealers’ profits. It has two long horns, each thirty inches in length, with a 17 inch bell, and the cabinet is 18 by 14 by 10 inches. From this description it will be readily seen that it is not a toy, but one of the finest and highest grade instruments made. They offer to send it for a seven-days’ free trial, freight prepaid, without the payment of any money whatever. What an excellent Christmas gift this would make for the wife, the son, or daughter. Read their advertisement on page 366, containing a photograph of the instrument, and send for one of their free catalogues, which explains everything.

Coyne Trade School

Of the many educational institutions in the United States the Coyne Trade Schools in New York, Chicago and San Francisco occupy a unique and entirely new field. There is nothing new, to be sure, in trade schools, yet there is something definitely and distinctly new in these schools, where plumbing, bricklaying, plastering and electrical trades are taught under actual working conditions, and where such a thorough and practical application of trade technic is given. No better opportunity has ever placed itself whereby man or boy can in a course of three months learn a trade and leave the school to accept a position paying from $5 to $9 a day. These schools are conducted day and night the whole year around. There is no age limit or examination. Some of the students are 16 years old, and others are past 50. All that is required is a clean record, good common sense and a determination to learn.

Whole buildings are erected inside the school, where actual bricklaying, plastering and plumbing is done.

The home instruction is intended for men and boys who find it impossible to attend the schools, and is equally as practical in every respect as the school course, and is especially adapted for those who are employed during the day, for the reason you can practice at home during leisure moments and in no way interfere with your regular occupation.

With this course the pupil is furnished with a complete drawing outfit, a kit of plumber’s tools, plumber’s furnace, solder, joints prepared for practice, lead pipe and other material necessary for practice. The joints are prepared by the instructors and the pupil advances step by step, until a perfect joint has been completed, when more difficult practice is given. No better opportunity has ever placed itself whereby man could practice at home during leisure moments and in no way interfere with his regular occupation. No skilled mechanics required to do this work.

These figures tell exactly what we are doing—selling a $20.00 watch for $5.45. We don’t claim that this is a $40.00 watch or a $50.00 watch, but it is a $20.00 watch. A leading watch manufacturer recently sold us 100,000 watches—watches actually built to retail at $30. "They were so cheap that we couldn’t keep them in stock. We sold them for $7 to $8, but this would leave us a great amount of labor and expense. In the end our profit would be little more than we spent in making the watch. We had to sell for $7 to $8, direct to the consumer at $6.45. This Citizens Watch, which we offer at $9.45, is a rubied jeweled, finely finished gold-filled and handsomely designed instrument. The jeweled is a special feature of this watch. We refer to the first National Bank of Chicago, Chicago, Illinois, for copies of their records. We are authorized to offer the watch at $9.45. (Five-page Catalogue Mailed Free.)
SIMPACITY EXPANSION FASTENERS

ARE UNEQUAL FOR PATENT STORE FRONTS AND SHOW CASES

BAR CAN BE BENT TO FIT ANY AND EVERY REQUIRED ANGLE

The best is always the cheapest in the long run

We Are Both

WHITNEY MANUFACTURING COMPANY

WALTHAM

$250 to $500 PER MONTH IN THE REAL ESTATE BUSINESS

I will teach you the Real Estate Business by mail and appoint you my special representative. I handle Real Estate on the co-operative plan, the only profitable way, and need you, no matter where you are located no what business you are in. Ten ($10) will start you. I will help you make money. You should make $250 to $500 per month. Write for my free book: The Real Estate Business and Its Present Day Opportunities." It is a guide to the Real Estate business and it is free. Address


We Sell Direct

INTERIOR FINISH, MILLWORK, STAIRWORK

Windows, Doors, Blinds, Interior and Exterior, Window and Door Frames, Composition Caps, Porch Material, Builders' Hardware.

GLASS for BUILDING PURPOSES

Send us your plans for delivered prices.

We Make Quick Shipments

416 Page Catalogue Mailed Free

BAYER BROS. SASH & DOOR CO.

Dept. C.

ST. LOUIS

The Improved "MILES" No. 2

The Machine

that makes TRUE, WET CONCRETE STONE

that makes BLOCK of ANY ANGLE

with MOVABLE END GATES

that is demonstrated before you buy

that makes the GREATEST RANGE of Work

that makes you want another just like it

The same principle has operated successfully for five years and is fully covered by our patents. VERTICAL CORES. Meet us at Buffalo Convention. Get Our 1908 Catalog.

THE P. B. MILES MANUFACTURING CO. Inc.

109 W. Cortland Street, Jackson, Mich.
It Is Not The First Cost

of a metal ceiling that makes it cheap. The cost of a ceiling is not complete until the work is accepted by the architect or owner. If the plates do not fit, your expense may be enormous. Better be on the safe side and get “Canton” Metal Ceilings. We have a reputation for good work.

Our book “Art in Metal Ceilings” free.

THE CANTON ART METAL CO.
Formerly THE CANTON STEEL ROOFING CO.
CANTON, OHIO

Send for Catalogue No. 2, which shows 200 new and original designs.

MANUFACTURED BY
Wm. Foster & Sons, Inc.
Springfield, Illinois


“EASTLAKE” METAL SHINGLES
For roofing all buildings with one-quarter pitch or more.
NEVER LEAK
They reduce the fire risk, and cost of insurance. Superior and cheaper than wood shingles. Any good carpenter or mechanic can lay our shingles.
Tools Required—Hammer and Shears.

THE W. J. BURTON CO.
Manufacturers of all kinds of roof trimmings.
DETROIT, MICH.
Mr. CONTRACTOR and BUILDER:

Do You Know About Our Prong Lock Studs and Furring for Use with Metal Lath?

It is a system you ought to be posted about. It is both simple and effective. One man can hang the lath on the prongs and clinch them securely with the tap of a hammer. Berger Prong Locks save time and money; there's no wiring, and the lath can't get away. Write today for Catalog FS5-S, which shows how this system is applied to various classes of construction.

THE BERGER MFG. CO.

CANTON, OHIO

New York Philadelphia Boston Chicago
St Louis San Francisco Minneapolis Atlanta

SPECIALTIES

Steel Ceilings, Roofing, Siding, Conductor Pipe, Fireproofing, etc.

DAVENPORT FOUNDRY & MACHINE COMPANY

DAVENPORT, IOWA

MANUFACTURERS OF BUILDING CAST IRON

STRUCTURAL AND ORNAMENTAL STEEL

FIRE ESCAPES

BEAMS

CHANNELS

ANGLES

AND TEES

CARRIED IN STOCK

STAIRWAYS

FENCES

JOIST ANCHORS AND HANGERS

SASH WEIGHTS

Write Department D for Estimates.

DO YOU WANT

PERFECT LIGHT

COMBINED WITH

PERFECT VENTILATION?

If so, investigate the WILLIS Ventilators and Skylights. Our Skylights are made in seven different styles, and can be set up by any person of ordinary ability without the use of tools or solder and have a perfectly water-tight job. Send for Catalogue No. 5 of Skylights, Cornices, Crestings, Finials, etc.

WILLIS MFG. CO.

GALESBURG, ILL.

Original makers of the Willis Hip Shingle.
Mullins
Makes Everything in
Art Architectural
Sheet Metal Work

Our factory is the largest and best equipped in the world and our wide experience and skilled artisans enable us to execute the most intricate and delicate work ever attempted in sheet metal, promptly and with complete satisfaction.

Our 120 Page Catalogue of stock designs will be sent on request. Estimates, models, designs, etc. submitted for architects, builders and contractors.

The W. H. Mullins Co., 214 Franklin Street, Salem, Ohio
Makers of everything in Sheet Metal.

Northwestern Expanded Metal Company
D. D.
Expanded Steel Plastering Lath

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<th>Yard</th>
<th>Per</th>
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Telephone Main 799
945 Old Colony Building
CHICAGO

SYKES
TWO BEST LATHS IN THE WORLD
METAL LATH & ROOFING CO. NILES, OHIO.
U. S. A.

MONTROSS METAL SHINGLES
are Lightning and Storm-Proof, Durable, Handsome and Inexpensive, and at the same time much more easily and quickly laid than any other roofing.

There is a neat little patent in them for you.

SEND FOR CATALOG.

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
GRILLES
COLUMNS AND
CONSOLS

In quality and price our work is not surpassed. You will make no mistake in writing us before ordering elsewhere.

Send for Catalog No. 14
It contains many fine designs of modern Grilles, Columns and Consols. Illustration at right shows half-section of Column design No. 455.

Northwestern Grille Works
CHRISTENSON BROS., Props. 1452 Milwaukee Ave., Chicago

Take a few minutes right now and get real facts on

Steel Ceilings and Side Walls

Call in your stenographer and simply say, "Eller Manufacturing Company, Canton, Ohio. Send for catalogue." You will be more than repaid. We take such an interest—are glad to serve you, and for years everybody knows "Eller" has stood for the highest in quality.

ELLER MANUFACTURING COMPANY
CANTON, OHIO

Good Agents Wanted to handle and sell

Edwards Metal Ceilings

New Ceiling Catalog "A" showing complete line of Ceilings and Side Walls sent free to those in the market.

The Edwards Mfg. Co.
"THE SHEET METAL FOLKS"
Main Office and Works:
401-417 Eggleston Ave., Cincinnati, O.
Manufacturers of the most extensive line of Sheet Metal Building Material in the world.

Stung Again
Didn't Buy Kannebergs Ceiling

We can satisfy you in quality of material, beauty and large number of Classified Designs and Prompt Shipments. You can save money by dealing with us. Write today for prices and our Ceiling Catalog DD. We also Manufacture Metal Shingles, all styles Roofing, Cornices, Skylights, Finials, Ventilators, Trough and Pipe, etc. Roofing Catalog GG. Let us figure with you.

The Kanneberg Roofing & Ceiling Co.
Manufacturers
Canton, Ohio.
GENUINE BANGOR
Large Facilities, Prompt Deliveries
EAST BANGOR CONSOLIDATED SLATE CO. - - - East Bangor, Pa.

KANSAS CITY SLATE & TILE ROOFING CO.
CONTRACTORS AND WHOLESALE DEALERS IN
ROOFING SLATE AND TILE
Send us your estimates and Write for CATALOGUE No. 27
2027-2029 Forest Ave., KANSAS CITY, MO.

Roofing Slate
TRY A CAN FROM THIS LINE
Genuine Peach Bottom Genuine Bangor
Genuine Bangor Jackson Chapman
Big Bed Lehigh Penn. Hard Vein
Jobber in Sea Green, Unfading
Green, Mottled Purple, Variegated
Purple and Bright Red Slates
Sales Agent, Eastern Pennsylvania and Southern
New Jersey, for
AKRON ROOFING TILE CO.,
Manufacturers of Vitrified Roofing and Floor Tiles.
NO BETTER LINE OF ROOFING
COMMODITIES ANYWHERE
Write me at 303 Builders' Exchange,
R. T. CROPPER
PHONE: Bell 4693, Filbert; Keystone 1528 Main

THE E. J. JOHNSON CO.
ROOFING SLATE
38 PARK ROW
New York
Branch Office
626 Park Building, Pittsburgh, Pa.

Lehigh Structural Slate Mfg. Co., Inc.
Manufacturers of Genuine
LEHIGH CLEAR BLACK STRUCTURAL SLATE
Write for Price Lists
SLATINGTON, PA.
FLINT-COAT ROOFING

OUR ROOFING IS ON THE MINNESOTA STATE FAIR BUILDINGS

<table>
<thead>
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<td>2-ply Flint Coat Roofing</td>
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</tr>
<tr>
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<tr>
<td>4-ply Rubber Roofing</td>
<td>$2.75</td>
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<tr>
<td>Grit Coat Asphalt</td>
<td>$3.50</td>
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<tr>
<td>Ready Rock Roofing</td>
<td>$3.50</td>
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</tbody>
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Above prices are for one roll of 108 square feet, delivered at your railway station, all ready to lay. This roofing has a heavy felt insertion.

Linofelt is a scientific non-conductor of heat, cold and sound, a blanket of flax fibres (un-bleached linen threads) applied inside or outside the building.

SHELTER is one of the elemental needs of our race.

From the rude shelters of the cave man, we have evolved, through ages, the modern dwelling. We first guarded against deadly cold, then we required privacy. The modern dwelling must shelter us from heat as well as cold, and from distracting noises. Brick and stone keep out the wind and rain, and some of the heat, and some of the noise.

But the only material which keeps them out entirely is LINOFELT.

LINOFELT is a scientific non-conductor of heat, cold and sound, a blanket of flax fibres (un-bleached linen threads) applied inside or outside the building.

We have in use today over half a billion square feet—we can not make it fast enough.

Every builder can learn about it from our booklet, sent on request, and he needs to learn, for he may have to put it up any day.

UNION FIBRE COMPANY,
Dept G
WINONA, MINNESOTA.
Compound doors are specified by Leading Architects and used by Leading Contractors in many important buildings throughout the country.

Send us your lists for estimate.
Our Design Book free for the asking.

Cleveland Grille & Mfg. Co.
Artistic Grilles
Made in Elaborate and Attractive Designs.
ILLUSTRATED CATALOGUE FREE.
Cleveland Grille & Mfg. Co.
CLEVELAND, O.
Special Designs on Request.

EVERYTHING IN CEMENT MACHINERY

TO BE in the concrete making business in the Miracle way is to be in it in the most profitable way—the most satisfactory all round. For example, in tile and sewerpipe making—With

MIRACLE SEWERPIPE AND TILE MOLDS

you can start upon a small and inexpensive scale—say $57.50 for a complete outfit for making 24-inch pipe.

You can make 110 feet of this pipe per day, and when you consider that the first 68 feet you sell pays for the entire equipment you can judge how quickly you will be making clear profit on your outfit.

And you will make Tile that will sell at the same price as burnt clay at about 150 per cent profit.

OUR NEW CATALOG

We have just received our new catalog, which is more complete and attractive than ever before, has over 500 illustrations, pages 9 x 12. We want to place this catalog in the hands of all our cement working friends and while the regular price is 25 cents, if you will tell us what line you are interested in and ask for Catalog K we will be glad to mail it free.

ADDRESS

Miracle Pressed Stone Co.
Largest Manufacturers of Cement Machinery in the World
Minneapolis, U. S. A.

Miracle Concrete is our new little trade magazine, published "when the spirit moves us." Send in your name and we will place it on our complimentary list.
Cement World

The Best, Largest and Most Practical Trade Magazine of CEMENT CONSTRUCTION
More Illustrations, More Pages of Good Instructive Reading than Any Other
Carpenters and Builders
Should Know all About Cement, the Coming Building Material

Elevations, Details and Plans of Residences, Churches, School Houses, Warehouses, Farm Buildings, Public Buildings Are Regular Features of the Cement World

Special Articles of Importance to Builders Appear Every Month
Its Editors and Writers are Authorities in This Field

GET POSTED ON THE NEW INDUSTRY
The steadily diminishing supply of lumber and the ever-increasing price asked for it will soon make it absolutely necessary for carpenters and builders to learn how to use cement as a substitute for wooden structures. This time has already arrived in many parts of the United States and Canada. Experiments in concrete and cement houses are a thing of the past. It has been proven that they are a success. Thousands of new patents covering the use of cement as a building material are being taken out yearly. Do not delay studying this question fully—it will be time well and profitably spent. You may have to use the knowledge soon. Many practical articles appear in each issue that will save money for Cement World readers.

SUBSCRIPTION PRICE $1.00 PER YEAR
The Cement World has more paid-in-advance subscribers than any other cement paper published. It has subscribers in every state and many foreign countries. It is "the World's Greatest Cement Paper."

CEMENT WORLD
241 Fifth Avenue - Chicago

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
"Keep the Quality Up."

A WAY TO PREVENT DAMP WALLS

Francis Concrete Block Machine Using Medium Wet (Plastic) Concrete.

"Quality is the watchword." The watchword of manufacturing today is economy. Competition necessitates reduced expenses, and at the same time "Keep the Quality Up." Berlin System means Quality. But it takes price to clinch your sales. This is the decided advantage of the Francis machine.

Hollow Building Block Machines.
Window Sill Machines.
Fence Post Machines.
Cement Brick Machines.

Get Our Present Low Prices.
All prices advanced Jan. 15th, 1908.
FRANCIS MACHINERY COMPANY,

The U. S. Standard CEMENT BLOCK MACHINE and the U. S. STANDARD CONCRETE MIXER

A pile of sand, some cement, and a little common sense. This is all that is needed to produce the most artistic, the most durable and the least expensive material with which to build the finest residence on the avenue, or the best warehouse, factory or barn. If interested, don't fail to write for our descriptive Catalogue "A."

Latest Model with Veneer Attachment

4" X 8" X 24" ROCK FACE IN 12" X 12" SECTIONS

Manufactured by The Ashland Steel Range & Mfg. Co.
Ashland, Ohio

Bricklaying Taught by Practical Bricklayer

In Two to Three Months
Begin now. Bricklayers are in big demand. As we teach bricklaying exclusively we turn out the most expert mechanics.

Individual Instructions. You start right in with the tools and learn how to lay brick.

Write for Circular

CHICAGO SCHOOL OF PRACTICAL BRICKLAYING
Henry T. Kies, Prop. 2115-17 W. Adams St., Chicago

Thunder and Lightning

Get out of the rain and buy a Lightning Block Machine that defies all competition. Has wonderful capacity.

Write and Do It Now

D. F. DETRICK
No. 8 S. Canal St.
DAYTON, OHIO

Cement Machinery Mfg. Co.
PLAIN CITY, OHIO
Manufacturers of Hollow Block Machines, Hand and Power Mixers, Power Tamper, Special Molds and Tools
We also have for sale second-hand Block Machines and Concrete Mixers of various makes
Write for our Catalogue and Prices

THE FRANCISCO BLOCK MACHINE IS A WONDER

NOTE WHAT IT MAKES. Two 24-inch blocks at one operation, or one 32-inch and one 16-inch, or two 20-inch and one 8-inch, or three 16-inch, all made on one pallet and off-bearing at once. By placing in extension, makes caps, sills, lintels and waterproof, any length up to 5 feet 6 inches long, 8, 9, 10 and 12-inch blocks, for width of wall. All made from the adjustments on the machine. No additional parts required, which means a big saving in the cost of your equipment. Also makes circles, octagons, angles, chimney blocks, porch columns, veneered slabs, sidewalk block, and sectional blocks. Is a face-down machine, using crushed stone, gravel or sand, wet process and wood pallets. Send for Catalogue "G" showing six different sizes of machines. Also Fence Post Machines. Agents wanted. Don't delay.

FRANCISCO BLOCK MACHINE CO., 338 No. High St., Columbus, Ohio

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN CARPENTER AND BUILDER
THE ONLY MACHINE

WITH A SELF-LOCKING MOLD IS

THE

Brandell

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New copy, changes and corrections for advertisements must reach office of American Carpenter and Builder, 185 Jackson Boulevard, Chicago, not later than December 20 in order to insure insertion in the January number.
Four New Books

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EDITED UNDER THE PERSONAL SUPERVISION OF

WILLIAM A. RADFORD

Editor in Chief of the AMERICAN CARPENTER AND BUILDER

Asstated by

ALFRED W. WOODS, the World's Greatest Expert on the Steel Square, and
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TWO VOLUMES

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**Hand Painted**

**Clear Glass**

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